DIGITAL TRUST CENTRE (DTC SINGAPORE)

INNOVATION GRANT CALL

RULES AND GUIDELINES

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1. Overview

1.1 The Digital Trust Centre (DTC Singapore) is a national centre for research in trust technology to spearhead efforts to develop trust technologies, including AI safety and strengthen Singapore's status as a trusted hub in the digital economy. The key objectives of DTC Singapore, which also houses the Singapore AI Safety Institute are to advance scientific research capabilities to be at the forefront of trust technology, grow Singapore's trust technology industry, and build a strong core of talent.

1.2 The programme aims to strengthen Singapore's Trust Tech ecosystem and accelerate the research and translation of trust technologies. Hosted at the Nanyang Technological University (NTU), DTC Singapore will engage in:

- Coordinating research grant calls in identified trust technologies to address industry problem statements and help industry build a competitive edge through novel IP.
- Developing sandboxes together with industry to experiment with trust technologies and prove value and viability of technology solutions through demonstrators and minimum viable products (MVPs).
- Providing research engineering support to co-develop solutions with leading enterprises and high-growth start-ups who have the capability and penchant to adopt early solutions in trust technologies.

- Cementing Singapore as a thought leader in the field of trust technologies, including AI Safety through international exchanges, allowing Singapore to build mindshare and influence global standards in the digital trust domain.
- Grooming talent and scaling up research capabilities as the key substrate for indigenous capabilities in trust technologies.

1.3 DTC Singapore will be launching the DTC Call for Trust Tech Innovation ("DTC Singapore Innovation Grant Call") to promote and facilitate innovation in using Trust Tech to support digital transformation as well as its translation into actual use cases.

1.4 The DTC Singapore Innovation Grant Call is a competitive research funding initiative that seeks to support collaboration between Singapore-based Institute of Higher Learning (IHLs) [1]/Research Institutes (RIs)[2] and companies with presence in Singapore ("companies") to co-develop Trust Tech solutions. The goal is to promote and facilitate innovation in Trust Tech, support digital transformation and translation into actual use cases. IHLs/RIs are required to collaborate with companies ("team") to form multi-disciplinary teams and consortia of industry domain experts, engineers, researchers, scientists, academics and other professionals to be eligible for this grant.

1.5 Please refer to paragraph 7.7 for the timeline of DTC Singapore Innovation Grant Call and deadline for submission of proposals.

2. Scope of Innovation Grant Call

2.1 In line with goals and directions above, the DTC Singapore Innovation Grant Call will partner IHLs/RIs with companies to focus on trust technologies. We are particularly interested in research that have great potential to:
- Generate innovations in trust technologies that can support digital transformation and can be translated into actual use cases,
- Address systemic real-world problems in the field that once solved, can be scaled for other players in the sector or industry.

2.2 The proposed opportunities and focus areas shall include, but not limited to, the following:

Trusted Analysis and Compute
The main focus will be related to sharing of sensitive data/model in artificial intelligence and machine learning. The emphasis will be on trust technologies enhanced computation without disclosing the actual raw data and/or analytic model:
a) **Privacy-preserving AI**
b) **Privacy-preserving tech:**

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[1] Institutes of Higher Learning (IHLs): National University of Singapore (NUS), Nanyang Technological University (NTU), Singapore Management University (SMU), Singapore University of Technology and Design (SUTD), Singapore Institute of Technology (SIT), Singapore University of Social Sciences (SUSS).
[2] Research Institutes (RIs): Such as the Agency for Science, Technology and Research (A*STAR) institutes.

     i.   Full Homomorphic Encryption (FHE)
    ii.   Searchable Symmetric Encryption (SSE) with analytics
   iii.   Data Synthesis (DS)
   iv.   Secure Multi-Party Computation (SMPC)
    v.   Federated Learning (FL)
   vi.   Differential Privacy (DP)

Decentralisation and Web 3.0

The focus will be on verifiable credentials/documents and transferable records in a decentralised environment, track and trace in supply chain, digital identity and analytics on decentralised finance:

a) **Blockchain analytics (in particular, against financial crimes)**
b) **Trusted decentralised digital identity**
c) **Decentralised computing and storage systems**

Trusted Accreditation

The focus will be on: (i) foundational AI model risks that impact on the entire AI ecosystem, (ii) services and platform available to perform foundational AI model risk assessments, and (iii) mechanisms to avoid AI risks (or at least reduce the impact of collective failure of AI ecosystem)

a) **Trustworthy AI**
     i.   Function as intended
    ii.   No unauthorised modifications
   iii.   Operated in a secure manner
b) **Responsible AI** – Traditional AI risks of user and organisations**.**
     i.   Fair, Transparent, Explainable
    ii.   Accountable, Ethically developed
   iii.   No misuse of data in favour of ML
c) **Safe AI** - Frontier AI risks of societal harms and public safety.
     i.   Harmful content, Value alignment
    ii.   Disinformation, Hallucination
   iii.   Copyright, Data supply chain risk

2.3   The proposed research, problem scope, technical approach, and potential impacts of the proposal shall be defined by the team. Moreover, proposals should clearly state the following:

- Alignment of the proposal to DTC Singapore's objective and direction
- Concise problem statement for a well-defined real-life use case, where trust is a major concern and trust technology is critical to address the problem
- Potential benefit of co-developed solution to enable digitalisation and digital transformation, and impact on the sector or industry when scaled for other players.

3. Funding Support

3.1   Funding quantum is up to **S$1 million for a project duration of 12 months.**

3.2   The proposal shall be based on a realistic budget with appropriate justifications that correspond to the scope of work to be accomplished.

3.3   The corresponding budget requested will only support IHLs/RIs and **includes** 30% Indirect Research Costs (IRC)[3] for IHLs/RIs.

3.4   The total cost of each project includes all approved direct costs[4] and 30% IRC. All expenditure budgeted should be inclusive of any applicable Goods and Services Taxes (GST) at the prevailing rates.

3.5   Companies are required to provide in-kind contributions, e.g. manpower (mandatory), equipment, data, etc.

3.6   Beyond the funding support for IHLs/RIs, companies are encouraged to provide cash co-funding. The amount of cash co-funding by companies will determine the ownership of intellectual property developed under the grant (refer to 10B. Intellectual Property).

3.7   Requested funding for the project will only be awarded to the IHLs/RIs collaborating with the companies.

3.8   For all direct cost items proposed for the project, please refer to Annex C – Guidelines for the Management of DTC Singapore Innovation Grants, including the list of "Non-Fundable Direct Costs" and note the following:
   • Host IHLs/RIs must strictly comply with their own procurement practices.
   • Host IHLs/RIs must ensure that all cost items are reasonable and are incurred under formally established, consistently applied policies and prevailing practices of the host institution.
   • All items/services/manpower purchased/engaged must be necessary for the R&D work.

3.9   Research Scholarships are not supported under the DTC Singapore Innovation Grant Call.

3.10 Funds awarded cannot be used to support overseas R&D activities. All funding awarded must be used to carry out project related activities in Singapore.

4. Project Support

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[3] Indirect research costs are expenses incurred by the research activity in the form of space, support personnel, administrative and facilities expenses, depending on the host institution (IHLs/RIs)'s prevailing policy. Host institution (IHLs/RIs) will be responsible for administering and managing the support provided by DTC Singapore for the indirect costs of research.

[4] Direct costs are defined as the incremental cost required to execute the project. This excludes in-kind contributions, existing equipment and the cost of existing manpower as well as building cost. Supportable direct costs can be classified into expenditure on manpower (EOM), expenditure on equipment (EQP), other operating expenses (OOE) and overseas travel (OT).

4.1 DTC Singapore is equipped with resources and facilities to support applicants in the broader Trust Tech community in preparation for the grant call and throughout the project. Applicants may leverage the following resources:

- **Body of Knowledge**, an online portal (https://trusttech.sg/) that provides
  a) A 'Digital Directory', a user-friendly platform that:
      i. Builds a network and facilitates easy identification of experts with trust tech capabilities in IHLs/RIs and industry in Singapore.
      ii. Foster interaction and enables connections between IHLs and the industry to explore potential collaboration on innovative projects.
  b) A Forum: A channel for the users to discuss challenges, exchange ideas, and potentially engage collaborators for problem resolution.
- **Trust-Tech Networking**
  a) At least one event will be organized by DTC Singapore before the innovation grant call.
  b) It facilitates interaction between industry and local IHLs to explore collaboration opportunities in preparation for the innovation grant call.
- **DTC Singapore Common Engineering Pool** (subject to DTC Singapore's assessment or availability)
  a) Types of capabilities in this pool of engineering resource include web services, network programming, software engineering, cloud computing, and privacy-preserving technologies.
  b) Availability of these resources is subject to factors such as resource in DTC Singapore, current activities in DTC Singapore, and potential demand from other grant call proposals. Applicants who are interested in this resource should consult DTC Singapore in advance.
- **DTC Singapore Sandbox** (subject to DTC Singapore's assessment or availability)
  a) Open to tech companies, end-user companies and IHLs/RIs to test their applications and/or datasets and to evaluate the potential of trust tech.
  b) These virtual computational sandboxes provide a secure and high-performance compute environment for the awarded projects.

4.2 Requests for resources listed in paragraph 4.1 should be aligned with current research focus of DTC Singapore stated under paragraph 2. Applicants are requested to explicitly state the expected resource to be tapped on and to quantify their need, if applicable, of such resources from DTC Singapore. This will be considered as part of their proposal request. Due to the constraints of limited resources, applicants will need to include a justification for the requests and the projected scope/utilisation of the resource. DTC Singapore will evaluate all request and assess ability to support the project based on factors including availability of resources, alignment with DTC Singapore's priorities.

4.3 Consultation
- All applicants may consult the DTC Singapore Grant team to find out how to enhance your grant proposals and increase the impact of your ideas.
- Applicants who want to apply for the common engineering resources, sandbox resources and project rooms in DTC Singapore are strongly encouraged to approach DTC Singapore for consultation ahead of the proposal submission to discuss about the demand and availability of DTC Singapore to support the request.

- Please fill up the form ([click here](#)). DTC Singapore will reach out to the applicants for further discussion or schedule a meeting based on the specific needs.

5. Project Deliverables and Outcomes

5.1 Each project is expected to deliver most, if not all, the following deliverables:
- Industry R&D jobs.
- Technologies deployed, including licences.
- Publications in top 10% journals.
- PhDs and Masters trained.

5.2 In addition to the above deliverables, each project team may state deliverables applicable to the project.

6. Eligibility

6.1 The grant call is open to Singapore-based IHLs/RIs, who must collaborate with companies.

6.2 At the point of application, the Lead Principal Investigator (PI) must be from an IHL/RI.

6.3 The Lead PI must hold a full-time[5] appointment in one of the eligible IHLs/RIs at the point of application and must be a subject matter expert in the proposed domain.

6.4 Researchers from Medical Institutions[6], start-ups in Singapore, private sector and other entities in Singapore or overseas are eligible to apply as Collaborators.

6.5 The project team must have the right skills and experience to deliver the project and demonstrate sufficient engagement with stakeholders to scope the proposal.

6.6 The overseas collaborators and/or visiting experts may be invited to Singapore on short-term engagements to assist with specific project tasks. In this arrangement, the costs of airfare, accommodation and per diem can be budgeted under the other operating expenses of the project.

6.7 Only research conducted in Singapore may be funded under DTC Singapore Innovation Grant Call. Please refer to Annex B – Terms and Conditions of DTC Singapore Innovation Grant.

6.8 Lead PI should note that parallel submissions are not allowed – i.e., applicants must never send similar versions or part(s) of the current proposal application to other agencies or grants for funding (or vice versa). Co-PIs and collaborators are recommended not to

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[5] Defined as at least 9 months of service a year based in Singapore or 75% appointment.
[6] Researchers from Medical Institutions in Singapore who hold at least 25% joint appointment in a Singapore-based IHL and/or A*STAR RI may apply as Lead PI or Co-PI. If awarded, the grant will be hosted in the IHL / A*STAR RI.
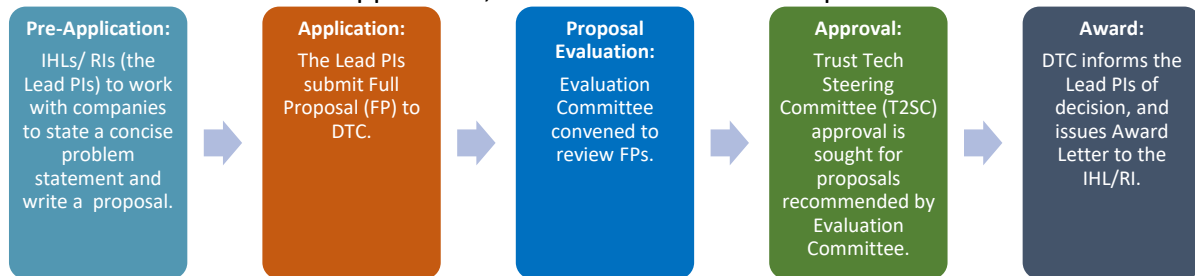
engage in more than 2 proposals. Proposals should not be funded, or currently considered for funding, by other agencies. Details of all grants currently held or being applied for by the Lead PI in related areas of research must be declared in Annex A - DTC Singapore Innovation Grant Call Proposal Template.

7. Evaluation and Selection

7.1 Full proposals are to be submitted using the Annex A - DTC Singapore Innovation Grant Call Proposal Template and must also adequately address the pointers stated in therein.

7.2 Full proposals will be evaluated by the Evaluation Committee, based on the quality of the proposals in the key aspects listed in paragraph 2.3 and project management plan.

7.3 An illustration of the application, evaluation and selection process is shown below:

Pre-Application:	Application:	Proposal Evaluation:	Approval:	Award:
IHLs/ RIs (the Lead PIs) to work with companies to state a concise problem statement and write a proposal.	The Lead PIs submit Full Proposal (FP) to DTC.	Evaluation Committee convened to review FPs.	Trust Tech Steering Committee (T2SC) approval is sought for proposals recommended by Evaluation Committee.	DTC informs the Lead PIs of decision, and issues Award Letter to the IHL/RI.

7.4 The evaluation will be carried out by the Trust Tech Technical Committee (T2TC) but based on reviews of the proposals solicited from local and overseas experts.

7.5 Evaluators will not participate in the evaluation process of his/her own proposal and should not be asked to review proposals from their affiliated institutions.

7.6 The evaluation process is expected to take approximately 12 weeks. **All decisions are final, and no appeals will be entertained.**

7.7 The timeline for this DTC Singapore Innovation Grant Call is shown below:

Event	Date
Opening date for submission (softcopy via email)	17 June 2024
Submission deadline	16 August 2024, 5:00pm
Evaluation and approval of proposals	Mid-August to Mid-October 2024
Approval process	Mid-November 2024 to Mid-February 2025
Project commencement	Mid-February 2025 onwards

7.8 Please note that respective IHLs'/RIs' internal deadline for endorsement of full proposal for submission may differ. The proposal must be submitted by the Lead PIs via email to DTC@ntu.edu.sg according to the above timeline.

7.9 DTC Singapore reserves the right to reject late or incomplete submissions, and submissions that do not comply with application instructions.

8. Project Performance Review

8.1 Project teams will be required to give a final report and presentation after the end of term for final review.

9. Application

9.1 All applicants must fully comply with DTC Singapore Innovation Grant Call Rules and Guidelines, Annex B – Terms and Conditions of DTC Singapore Innovation Grant and Annex C - Guidelines for the Management of DTC Singapore Innovation Grant, which can be downloaded from www.ntu.edu.sg/dtc.

9.2 Interested applicants should submit the Annex A - DTC Singapore Innovation Grant Call Proposal Template and other supporting documents in PDF and Word. All applications must be submitted by the Lead PIs from IHLs/RIs via email to DTC@ntu.edu.sg according to the timeline specified in paragraph 6.7.

9.3 Only complete application with the endorsement of the relevant institutional authority / director of research (or equivalent), will be accepted by DTC Singapore.

9.4 Late submissions or submissions from individual applicants without the endorsement of the relevant institutional authority / director of research (or equivalent), will not be entertained.

10. Other Guidelines and Information

A. Proposal Content

10.1 The Proposal must adhere to the page limit, prescribed format and address the points as stated in Annex A - DTC Singapore Innovation Grant Call Proposal Template.

10.2 Research support office from the IHLs/RIs are required to ensure that information submitted by their researchers is complete and compliant with the requirements outlined in the application guidelines. Failure to do so will result in rejection without review.

B. Intellectual Property

10.3 Background Intellectual Property ("BIP") is any existing IP brought by the IHLs/RIs, and company into the Project. Unless expressly agreed otherwise, this Contract shall not affect each party's rights to its BIP. The IHLs/RIs and company shall grant to each other

use rights under its BIP for the purposes of this Project only.

10.4 Intellectual Property ("IP") developed under the grant call ("Research IP") shall be co-owned by the company and IHLs/RIs in accordance with the inventive or creative contribution, as well as the company's cash contribution to the project.

10.5 All Research IP shall be owned according to each party's Inventive Contribution as follows if the company contributes a cash contribution of less than 30% of the Funding as direct costs to the project:

(i) All Research IP shall be owned by the IHLs/RIs and the company based on each party's Inventive Contribution.

(ii) If Research IP is jointly owned between the company and IHLs/RIs, the latter will provide exclusive license to the company for the first three years to translate. In the event that the company has not translated within the three year period, then, each joint owner may fully exploit and license the technology non-exclusively to third parties.

(iii) The IHLs/RIs and the company shall in any event retain all rights, title and interests in all jointly owned Research IP and, except for the rights expressly licensed shall have the free and unfettered right to use and commercialise (which include granting licenses to third parties) the jointly owned Research IP for any purpose (whether for research, education and collaborative purposes or commercial purposes) on a non-exclusive basis without seeking the consent of the other joint owner(s).

(iv) Each party grants to the other party a non-transferable, non-exclusive, perpetual, worldwide, royalty-free, fully paid-up license to use its solely owned Research IP for its internal, academic, research, development, educational and non-commercial purposes including but not limited to collaborative research projects with third parties. Any party who wishes to use the Research IP solely owned by the other party for commercial purposes shall separately negotiate with the other party for a license on terms and conditions to be mutually agreed.

(v) For jointly owned Research IP, the company shall determine the filing of IP applications and all IP applications shall be filed in the names of the joint owners. All IP expenses shall be borne by the company.

10.6 All Research IP shall be jointly owned as follows if the company contributes a cash contribution of at least 30% but less than 50% of the Funding as direct costs to the project:

(i) All Research IP developed by IHLs/RIs, whether solely developed or jointly developed with the company, shall be co-owned by the IHLs/RIs and the company in equal undivided shares.

(ii) The IHLs/RIs will provide exclusive license to the company for first three years to translate.

(iii) In the event that the Project Sponsor has not translated within the three year period, then each joint owner may fully exploit and license the technology non-exclusively to third parties. Except for the rights expressly licensed, the IHLs/RIs and the company shall in any event retain all rights, title and interests in all Research IP and shall have the free and unfettered right to use and commercialise

(which include granting licenses to third parties) the Research IP for any purpose (whether for research, education and collaborative purposes or commercial purposes) on a non-exclusive basis without seeking the consent of the other joint owner(s).

(iv) The company shall determine the filing of IP applications and all IP applications shall be filed in the names of the joint owners. All IP expenses shall be borne by the company.

10.7 If the company contributes a cash contribution of at least 50% of the Funding as direct costs to the project:

(i) All Research IP created by solely or jointly with IHLs/RIs shall be solely owned by the company, who will provide the IHLs/RIs a non-transferable, non-exclusive, perpetual, worldwide, royalty-free, fully paid-up license to use its solely owned Research IP for its internal, academic, research, development, educational and non-commercial purposes including but not limited to collaborative research projects with third parties.

(ii) The company may select any Research IP for patent protection. All cost related to the application for patent protection shall be borne by the company.

10.8 Such agreed terms shall be set out in a written agreement between the IHLs/RIs. The Investigators and Collaborators shall identify and disclose to the IHLs/RIs, details of all such Research IP.

10.9 The IHLs/RIs shall keep and maintain a fully comprehensive and updated list of all such Research IP and make such details available to DTC Singapore for inspection at any time.

10.10 The company and IHLs/RIs shall grant DTC Singapore a non-exclusive, non-transferable, sub-licensable, perpetual, irrevocable, worldwide, royalty-free right and license to use, modify, reproduce and distribute the Research IP (excluding any Research IP that is solely developed by a Collaborator) for research, development and/or commercial purposes (The "DTC License").

10.11 Except the rights expressly licensed or otherwise provided in this Rules and Guidelines or Annex B – Terms and Conditions of DTC Singapore Innovation Grant, the company and IHLs/RIs shall in any event retain all rights, title and interest in all Research IP and shall have the free and unfettered right to use and commercialise (which include granting licenses to third parties) the Research IP for any purpose on a non-exclusive basis without seeking the consent of DTC Singapore.

10.12 Management of all Research IP shall have reference to and be guided by the Host Institution IP Policy and key principles of the Singapore National IP Protocol for Publicly Funded R&D. In general, Research IP may be open-sourced for research and experimentation and licensed for commercial deployment.

10.13 The company and IHLs/RIs shall use best efforts to ensure that the Research IP is properly managed and wherever feasible, fully exploited and commercialised (including

being made available for research and development or commercial purposes). Where required to do so by DTC Singapore, the IHLs/RIs and company shall attend such meetings as DTC Singapore may direct to discuss the potential for exploitation and commercialisation of Research IP.

10.14 The company and IHLs/RIs shall reserve a royalty-free, irrevocable, worldwide, perpetual and non-exclusive right for the Singapore Government and public sector agencies to Research IP for their statutory functions, non-commercial and R&D purposes.

C. Ethics and Confidentiality

10.15 All the Investigators, Collaborators, staff, and students working on the project must comply with the relevant local laws or regulations governing the research.

10.16 All teams are responsible for ensuring that ethical issues relating to their respective projects are identified and brought to the attention of the relevant regulatory bodies for approval. Approval to undertake the research must be granted before any work requiring approval begins.

10.17 Ethical issues should be interpreted broadly and may encompass, among other things, relevant codes of practice, the involvement of human participants, tissue or data in research, the use of animals, research that may result in damage to the environment and the use of sensitive economic, social or personal data.

10.18 The work should be conducted under strict international, national, and/or institutional guidelines on privacy and confidentiality protection of personal data use.

10.19 Whenever possible, all datasets used should be de-identified and anonymised, and/or proper consents and approvals should be obtained for the use of the data.

10.20 All the Investigators, Collaborators, staff, and students working on health and biomedical related projects should obtain CITI certification (https://about.citiprogram.org/en/homepage/) on biomedical data use or similar training and certification.

E. Contact Information

10.21 For any enquiries, please contact DTC@ntu.edu.sg.