



SmartCI Research Center

Call for Concept Paper



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1. Introduction

Smart Critical Infrastructure (SmartCI) research center established in June 2013 as a collaboration between VT-MENA (Virginia Tech - Middle East and North Africa) and Alexandria University and has been approved by the University Council as independent research center in July 2018. SmartCI aims to be a pioneering research institution that cooperates with government and private institutes in Egypt and Middle East to resolve challenges facing the ever-evolving and increasingly essential integration between information and communication technology and critical infrastructure resources and services through interdisciplinary and applied research. In addition, the center comprises a public-private partnership to provide an innovative engineering and science education model through integrated research and technology transfer services.

Specifically, SmartCI targets to (1) bridge the gap between theoretical and applied research and technology development; (2) form research groups in different fields capable to collaborate with each other and provide integrated innovative solutions for the infrastructure development using ICT; (3) establish highly equipped research labs at one place for researchers; and (4) link research projects/ ideas to the related interested bodies and suitable funding agencies and engage undergraduate/graduate students and industry personnel in experiential opportunities through industry-related research.

During the past 5 years, the center has hosted 15+ research teams, 60+ researchers, during their research proposals writing phase and 10+ research teams granted from national and international funding agencies. Besides, 3+ teams are conducting their research projects in collaboration with industry. Furthermore, the center has engaged 50+ students through summer internships to build their research skills. Moreover, SmartCI researchers were capable to publish 80+ papers in prestigious and high reputation journals and conferences, during the last 4 years.

With the SmartCI goals in mind, SmartCI Research Center is planning to incubate up to 10 research teams through the year to write their research proposals. The winning teams shall be hosted at SmartCI premises to enjoy its services. Additionally, SmartCI offers monthly incentive of 1500 EGP for each member of the hosted teams. Each application should include one target call for proposals, based on Section (3) of this document.

This call is open through the year with 4 reviewing cycles in January, April, July, and October.

2. Background

The fast development of Information and Communication Technology opens the opportunity to have significant impact on advancing our critical infrastructure. The rising interests and potential applications of new technologies and renovated ones like Internet of Things, Big Data, Data Analytics, and Artificial Intelligence can help analyzing the current situation and developing smart solutions for long lasting problems.

Thus, one of the most important steps to develop Critical Infrastructure in Egypt is to integrate it with Information and Communication Technology in order to build research knowledge base that can watch, secure and control elements of this infrastructure.

3. Target Calls for Proposals

SmartCI Research Center targets solutions to real problems facing the Egyptian Society through applied research projects that integrate Communications & Information Technology (ICT) into Critical infrastructure Systems. All the submitted applications must include one of the following potential calls for proposals. Areas of research interests for each call are defined in this section, taking into consideration that all the submitted concept paper must include an ICT research component.

Call 1

- Target funding agency: STDF
- Target call for proposals
 - Demand Driven Projects (DDP), or
 - National Challenge Projects (NCP)
- Maximum hosting duration at SmartCI: 2 months
- Eligibility criteria:
 - The PI must have an experience in the proposed topic and in solving similar problems
 - The concept papers directed to NCP must be directed to national needs or stressing a problem in the nation
 - The concept papers directed to DDP must be directed to solve a problem in the private sectors
 - End user/Beneficiary commitment letter signed and stamped by a governmental body for the NCP or a private entity for the DDP is mandatory to be included in the concept paper. The letter should show the expected collaboration between the research team and the interested entity throughout the research project.
- Research areas of interest:
 - National priorities include all topics related to; Water, Energy, Health, Agro/Food and ICT. Examples may include assisting a production establishment to:
 - Introduce a new product that is being currently imported
 - Improve a nationally produced product to pass and meet exportation norms thus generating foreign currency
 - Minimize production costs of a nationally produced product thus meeting challenges

- resulting from similar imported products at lower costs
- New way in early diagnosis, prevention or treatment of endemic disease

You can check the STDF last call documents on their website:

<http://www.stdf.org.eg/index.php/en/2018-01-09-14-23-31/stdf-grants-archive-2>

Call 2

- Target funding agency: STDF
- Target call for proposals
 - Young Researcher
- Maximum hosting duration at SmartCI: 2 months
- Eligibility criteria:
 - The PI must:
 - be less than 40 years old at the date of proposal submission
 - have obtained his / her PhD degree within the past five years before the date of the proposal submission.
 - have internationally published at least two papers
 - In addition to the PI, the team may include:
 - one senior PhD holder, as a consultant,
 - one PhD holder, who has obtained his / her PhD degree after the PI's date of obtaining his PhD degree,
 - one BSc. or MSc. Holder, as a Research Assistant (RA)
- Research areas of interest:
 - All disciplines

You can check the STDF last call documents on their website:

<http://www.stdf.org.eg/index.php/en/2018-01-09-14-23-31/stdf-grants-archive-2>

Call 3

- Target funding agency: STDF
- Target call for proposals
 - Reintegration
- Maximum hosting duration at SmartCI: 2 months
- Eligibility criteria
 - The PI (returning researcher) must:
 - be less than 40 years old at the date of proposal submission
 - have obtained his / her PhD degree within the past five years before the date of the proposal submission.
 - have a PhD certificate from one of the top 500 ranked universities according to Shanghai Ranking for 2008 (<http://ed.sjtu.edu.cn/ranking.htm>)
 - The only PhD holder in the team must be the PI, in addition to at least one RA
- Research areas of interest:
 - All disciplines

You can check the STDF last call documents on their website:

<http://www.stdf.org.eg/index.php/en/2018-01-09-14-23-31/stdf-grants-archive-2>

Call 4

- Target funding agency: STDF
- Target call for proposals
 - Basic and Applied
- Maximum hosting duration at SmartCI: 2 months
- Research areas of interest:
 - All disciplines

You can check the STDF last call documents on their website:

<http://www.stdf.org.eg/index.php/en/2018-01-09-14-23-31/stdf-grants-archive-2>

Call 5

- Target funding agency: STDF
- Target call for proposals
 - Innovation Grant
- Maximum hosting duration at SmartCI: 2 months
- Research areas of interest:
 - Technological product/service innovation (All disciplines)

You can check the STDF last call documents on their website:

<http://www.stdf.org.eg/index.php/en/2018-01-09-14-23-31/stdf-grants-archive-2>

Call 6

- Target funding agency: STDF
- Target call for proposals
 - Research Support and Technology Development Grants (RSTDG)
- Maximum hosting duration at SmartCI: 2 months
- Research areas of interest:

ICT, energy, water, food and agriculture, industrial development, advanced and new technologies, prototype development, feasibility demonstration and concept validation, space technology...etc.

You can check the STDF last call documents on their website:

<http://www.stdf.org.eg/index.php/en/2018-01-09-14-23-31/stdf-grants-archive-2>

Call 7

- Target funding agency: STDF
- Target call for proposals
 - Research Support & Technology Development - Youth grant (RSGY)
- Maximum hosting duration at SmartCI: 2 months
- Research areas of interest:

ICT, energy, water, food and agriculture, health, strategic industries ...etc.

You can check the STDF last call documents on their website:

<http://www.stdf.org.eg/index.php/en/2018-01-09-14-23-31/stdf-grants-archive-2>

Call 8

- Target funding agency: NTRA
- Target call for proposals
 - Class 1 (Applied Research): starts with a proof of concept to end with a prototype
 - Class 2 (Basic Research): Starts with an idea and ends with a proof of concept (Paper or patent)
 - Class 3 (Standardization Research): Targets contributing to the standards developed by the standardization sector of the International Telecommunication Union (ITU-T)
- Maximum hosting duration at SmartCI: 3 months
- Research areas of interest:
Telecommunications, Cyber-security and E-crime, Spectrum management, Techniques to measure and increase customers' experience of QoS, 5G networks, Internet of things (IoT), Software Defined Networks (SDN), Cloud computing, Social networking, Multimedia communications, Enhancement to cellular networks, Machine to Machine communications

You can check the NTRA last call documents on their website:

<http://www.tra.gov.eg/en/industry/research-and-development/Pages/NTRA-Seventh-Call-for-Research-Proposals.aspx>

Call 9

- Target funding agency: ITIDA-ITAC program
- Target call for proposals
 - Preliminary Research Projects (PRP): starts with an Idea to end with a proof of concept
 - Advanced Research Projects (ARP): starts with a proof of concept to end with a prototype
 - Product Development Projects (PDP): starts with a prototype to end with a product
- Maximum hosting duration at SmartCI: 3 months
- Eligibility criteria:
 - For the PRP, there must be an endorsement letter from an industrial partner
 - For ARP and PDP, the name of an industrial entity, that is interested to collaborate with the research team throughout the research project duration, should be listed. For the shortlisted concept papers, the industrial partner shall be requested to show their experience and areas of collaboration with the research team.
 - For both ARP and PDP, applicants who don't have an industrial partner may clarify this in their application and we can help them in the matching process. However, priority will be given to applicants with industrial partners.
- Research areas of interest:
 - Strategic Areas: Wireless and Cyber Security, Electronics and Embedded Systems for ICT Applications, ICT for Homeland Security, ICT for Transportation, ICT for Health, ICT for Agriculture, ICT for the Disabled, ICT for Education, ICT for Energy.
 - Technology-Trend Areas: Mobile Applications and Computing, Cloud Computing, Data Analytics and Big Data, Internet of Things, Gamification, Cognitive Computing, Smart Machines, Blockchain, and Virtual and Augmented Reality.
 - Demand-Driven Areas: Determined based on specific needs of governmental bodies, ministries, governorates, ...etc.
 - Proposals incorporating the use of open-source technologies and software-defined technologies are encouraged. The above areas are updated based on global technological reports and national needs.

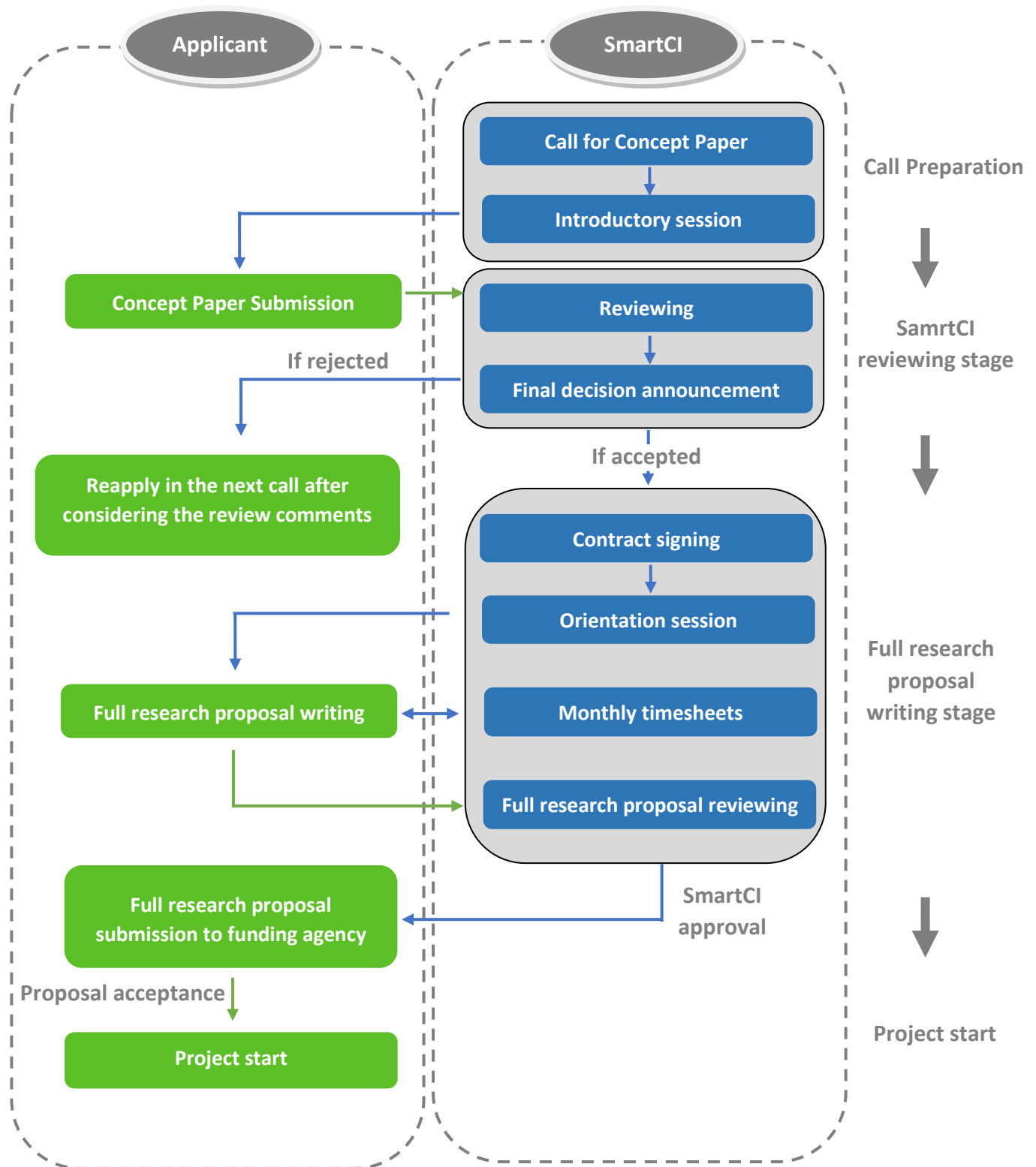
You can check the ITAC call documents on their website:

<http://www.itida.gov.eg/En/OurPrograms/ResearchInnovation/ITAcademiaCollaboration/Pages/Guides.aspx>

4. Application Procedure

- **Research Teams should:**
 - ✓ prepare concept papers to clarify their ideas to SmartCI Research Center
(SmartCI application template: <http://smartci.alexu.edu.eg/wp-content/uploads/2019/01/Concept-paper-application-template.docx>)
 - ✓ submit their concept papers to SmartCI Research Center according to submission guidelines described in sections (9 and 10) of this document.
- **Upon concept paper approval:**
 - ✓ PI signs contract with SmartCI.
 - ✓ SmartCI offers a monthly research incentive of 1500 EGP/ team member for up to 3 months or up to their full research proposal submission to the target funding agency (**the sooner of them**).
 - ✓ Administrative and financial team will help in the submission process to funding agencies as needed by the Research team.
- **Upon the receipt of funding agency acceptance notification:**
 - ✓ SmartCI Research Center signs the agreement with the funding agency.
 - ✓ SmartCI administrative and financial team take full responsibility of all research administration aspects of the research proposal.

The chart in the next page summarizes the call procedure starting from the call opening to the research project start.



5. Benefits gained by SmartCI Research Center affiliates

5.1. Upon Concept paper acceptance

- Applicants will be awarded with 1500 EGP/month for a period up to 3 months or until their full research proposal submission (**the sooner of them**);
- Some funding agencies award their funds to nonprofits rather than to individuals, affiliating yourself to SmartCI Research Center can increase your likelihood of receiving funding;

Additionally, winning teams shall enjoy a part or all of the following pre-award services:

- Access to the shared proposal writing incubator, for the PI to finalize their proposals prior to submitting it to the target funding agency, the shared incubators include:
 - Printers,
 - White boards,
 - Wi-Fi,
 - Scanner
- Access to the meeting rooms to finalize all the proposal submission requirements and negotiations with other partners, if needed;
- Workshops about proposal writing, and research projects management ...etc;
- Preparing all the paperwork needed by the target funding agency, such as signatures, stamps, recommendation letters...etc;
- Finding industrial partners to the academic teams for the collaborative research projects;
- Guidance to prepare different proposal sections including the budget and recommending refinements, as needed;
- Reviewing the research proposals to check their conformance to the target call for proposals requirements and guidelines.

5.2. Upon Full proposal acceptance, SmartCI may offer the following post-award services that include but are not limited to:

- tax-exempted fund as SmartCI Research Center is a non-profit, governmental center, which is saving the project an essential start-up fee;
- access to well-equipped incubators (as needed) that include:
 - Printers,
 - White boards,
 - Wi-Fi,
 - Scanner,
 - Kitchen area (Microwave, boiler, dispenser),
 - Projector
- access to meeting rooms, as needed;
- access to SmartCI labs and available equipment/ facilities ;
- reviewing the contractual terms and conditions of the new approved projects and helping the PI to fulfill all the contract signing requirements;
- SmartCI IT team support;

- following up the projects budget, reports, money deposits and recommending changes as needed;
- start and follow up the correspondences between the funding agencies and Projects' PIs;
- start, follow up and finalize all the procurement activities such as preparing the tender documents and any other paperwork.

6. Team Eligibility

- The PI must be a Ph.D. holder.
- The team must contain at least 1 Research Assistant (Ph.D. / MSc candidate) in addition to the PI.
- The team cannot include undergraduate students in the proposal writing period.
- Any concept paper that does not involve multidisciplinary team contribution will be excluded.
- The team may include more than three members, however SmartCI Research Center will fund up to **three** members per month for full research proposal writing.

7. General Rules and Obligations

- Projects should be related to **SmartCI** development.
- Full research proposal preparation period should not exceed the **hosting durations specified in Section (3) of this document**.
- Concept Paper should not exceed **twelve** pages including the cover page and references (excluding the resume pages).
- Ideas submitted to SmartCI shouldn't have been previously submitted to any other funding agency.
- Title to any equipment or supplies purchased or manufactured in the performance of the project shall vest in SmartCI Research Center.
- Overhead cost of the fund shall be transferred to SmartCI Research Center to be used in return of facilities and services offered by SmartCI.
- SmartCI will acquire IP share of any filed patents.

8. Evaluation

8.1. Criteria

- Relevance and eligibility to funding agency.
- Relevance to SmartCI theme.
- Importance of the proposal to industry and society.
- Research Methodology.
- Task distribution over team members.
- Timeline for full proposal writing.
- Team members' qualifications and profiles.
- Importance of the expected outcomes and liability for publication.

8.2. Decision

According to the above criteria, reviewing panel make their final decision and PIs receive decision letters include one of the following decisions:

- **Accepted:** without any changes.
- **Accepted with minor changes:** applicant is requested to make minor change and resubmit a revised version for the same cycle.
- **Rejected:** with recommendation to resubmit in the next call after addressing weaknesses clarified in the decision letter/ or the idea is not accepted for reasons clarified in the decision letter.

9. Timeline

- Submission opens: **Always**
- Submission deadline: **No deadline**
- Reviewing cycles: **January, April, July, October** of each year
- Hosting researchers for proposal writing starts on: **February, May, August, November** of each year

10. Submission Guidelines

- Applicants should submit their concept paper electronically on the website through the following form: http://smartci.alexu.edu.eg/?page_id=588
- The application to be uploaded in PDF format, file name should be “**PI’s name_ short name for the proposal**”.

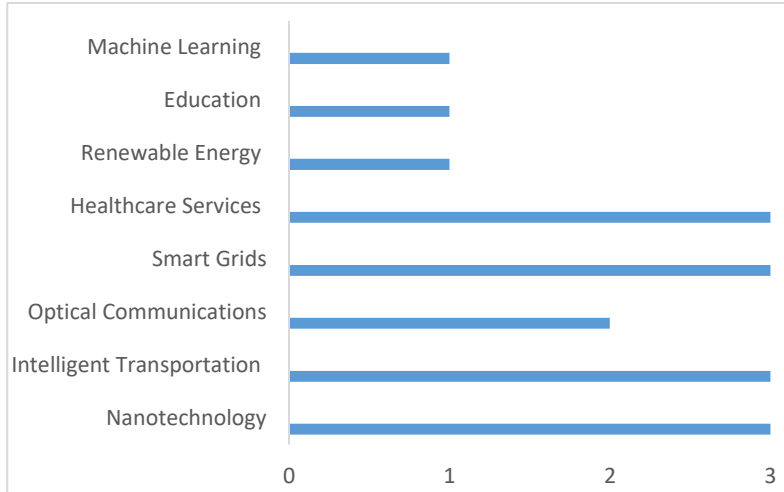


Appendix I

SmartCI Facts...

- The 1st call was within limited scope in Faculty of Engineering, Alexandria University.
- The other 5 calls were open to all Faculties of Alexandria University.
- SmartCI offered number of research seminars and workshops for researchers during their proposal writing period.
- SmartCI hosted 17 proposal writings during the previous 6 calls for concept paper in different research areas.
- Researchers at SmartCI submitted 25+ proposals to different national and international funding agencies, such as Microsoft, NTRA, STDF, ITIDA (ITAC program).
- SmartCI was/is incubating 16 funded research projects with total budget of 16 million EGP (7 million for equipment) from NTRA, STDF, AlexRep, ALEXENG, and ITIDA (ITAC program).
- On the other side, SmartCI got approvals for 19 research projects to be funded by different funding agencies with total funds of 19 million EGP, including 8.5+ million EGP were assigned to acquiring equipment to establish the following labs at SmartCI:
 - CRC testbed (Communications and Networks lab),
 - Heterogeneous high-performance computing cluster (H2PC2), and
 - Nanotechnology and photonics lab

Proposal Writings Research Areas



Funded Research Project

