SUPPLEMENTARY MATERIAL OF THE ARTICLE:

Linkage Academia–Industry/Innovative High-Performance Systems: A Pathway to Strengthen Technological Capabilities for Innovation in Public Research Centers in Mexico

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Questionnaire S1
Development of Technological Capabilities in Public Research Centers

Dear Researcher

Through this instrument, you will evaluate the level of technological capabilities within the Public Research Center (PRC) to which you are attached. Please select the frequency (never, rarely, occasionally, frequently or very frequently) the best represents how often the statements in the questionnaire apply.
The reliability and validity of the study depends on your answers, so please respond as carefully as possible based on your knowledge of your research center's activities.

1) **Name of the public research center**
2) **Position or position of the respondent**

3) With respect to the technology used within the PRC for research development

a. Standard market technology is acquired

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Specialized technology is evaluated, selected and acquired

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Proprietary technology is developed

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

4) About human resources allocated to research

a. There are assistants and/or technicians for basic engineering activities

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Auxiliaries/technicians receive training, and/or trained personnel are hired for detailed engineering activities.

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Staff specialization is encouraged, and/or new researchers are hired.

- Never
- Rarely
- Occasionally

- Frequently
- Very frequently

5) Regarding the knowledge of the personnel dedicated to research

a. Staff applies previously acquired knowledge

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Staff generates new knowledge through research and analysis

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Staff disseminates the new knowledge generated outside the organization, given its relevance.

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

6) About the projects carried out inside the center

a. Projects are carried out and administered by order of the agency to which the center belongs.

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Projects are managed (by initiative) before the agency to which the center belongs

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Projects are generated internally, and their management depends solely on the center.

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

7) Regarding the investigations that are carried out

a. Basic science is conducted (TRL 0-2)

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Applied research and/or technological development is carried out (TRL 3-5)

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Technological demonstrations and/or complete prototypes are carried out (TRL 6-8)

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

8) About the technological developments carried out at the PRC

a. Simple adaptations are made to designs with existing specifications

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Incremental innovations are made from reverse engineering and equipment design

- Never
- Rarely
- Occasionally
- Frequently

- Very frequently

c. R&D is conducted to design new products and equipment

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

9) Regarding product development

a. Incremental improvements or minor adaptations are made to existing products

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Incremental innovations are made through design and transformation processes and/or reverse engineering.

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Radical new product innovations are made through R&D

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

10) In relation to the validation of the developed technology

a. It is validated at the laboratory and/or prototype level

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. It is validated in an environment with characteristics similar to the real environment

- Never
- Rarely

- Occasionally
- Frequently
- Very frequently

c. It is validated in a real environment (with potential users)

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

11) In relation to the technological services offered by the PRC

a. Consulting/analysis/characterization services are performed without certification

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Consulting/analysis/characterization services are performed with national external certification

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Consulting/analysis/characterization services are performed with international certification

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

12) Regarding the use and management of intellectual/industrial property

a. Technology licenses and/or existing products are acquired

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Proprietary technology is developed and intellectual/industrial property is generated

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Intellectual/industrial property is transferred and/or marketed outside the PRC

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

13) About the scientific-technological linkage

a. Projects are executed in conjunction with workgroups within the center

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

b. Workgroups are formed between institutional partners

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

c. Collaboration networks are formalized outside the organization at a national and/or international level.

- Never
- Rarely
- Occasionally
- Frequently
- Very frequently

Questionnaire S2. Scientific productivity

The following information was requested, through the platform of the national transparency institute, about the productivity of public scientific and technological research centers/institutes, corresponding to the period from January 1, 2014 to December 31, 2019 was requested (excluding those dedicated to health, sciences, social, or humanities):

1. Name of each scientific and technological research center/institute affiliated with the institution
2. Name of the location of each branch of the research center/institute, including the main headquarters
3. Total number of researchers per branch, including the main headquarters
4. Total number of researchers who are members of the National System of Researchers by level (Candidate, I, II, III, Emeritus) for each branch and the main headquarters
5. Total number of technical staff, per branch and the main headquarters
6. Total number of research lines, per branch and the main headquarters
7. Total number of laboratories per branch and the main headquarters
8. Total number of scientific articles published in JCR journals, per branch and the main headquarters
9. Total number of scientific articles published in national peer-reviewed journals (not JCR), per branch and the main headquarters
10. Total number of scientific articles published in international peer-reviewed journals (not JCR), per branch and the main headquarters
11. Total number of book chapters published per branch and the main headquarters
12. Total number of books published per branch and the main headquarters
13. Total number of patent applications per branch and the main headquarters
14. Total number of patents granted per branch and the main headquarters
15. Total number of utility model applications per branch and the main headquarters
16. Total number of utility models granted per branch and the main headquarters
17. Total number of registered trademarks per branch and the main headquarters
18. Total number of technology transfers in progress per branch and the main headquarters
19. Total number of completed technology transfers per branch and the main headquarters
20. Total number of doctoral graduates per branch and the main headquarters
21. Total number of master's graduates per branch and the main headquarters
22. Total number of doctoral programs in the National Register of Quality Graduate Programs of CONACyT, per branch and the main headquarters
23. Total number of master's programs in the National Register of Quality Graduate Programs of CONACyT per branch and the main headquarters
24. Total number of research groups with national links per branch and the main headquarters
25. Total number of research groups with international links per branch and the main headquarters

26. Total number of national thematic networks to which researchers belong, per branch and the main headquarters
27. Total number of international thematic networks to which researchers belong, per branch and the main headquarters
28. Total number of projects linked with industry per branch and the main headquarters
29. Total number of projects linked with public services, per branch and the main headquarters
30. Total number of projects carried out and/or ongoing, from CONACyT calls, per branch and the main headquarters
31. Total number of technological foresight studies carried out per branch.