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Technology Platform

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Chapter 1: Introduction

1.1 Scope of the Document

This document describes the goals of the Technology Platform as well as its organization. Furthermore it shall describe selected high-level tasks and the decision flow to accomplish them. In general it follows the request dictated by the SNSF document 'Strategy for Knowledge and Technology transfer (KTT)' of 14/11/2014.

1.2 Acronyms

AD	Applicable Document
E-ELT	ESO's European-Extremely Large Telescope
ESA	European Space Agency
ESO	European Southern Observatory
FP-7	Frame Programme 7 of the European Commission
R&D	Research and Development
RD	Reference Document

Chapter 2: Current State and Aimed Goals

2.1 Assessment of the current state and general goals of the Technology Platform

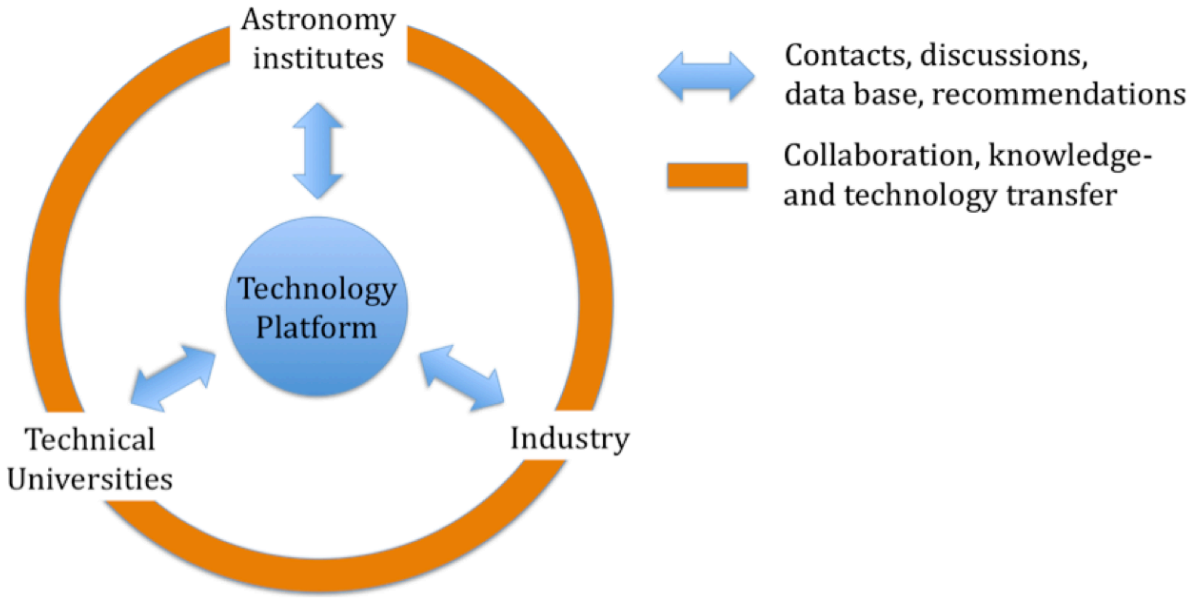
As a matter of fact, present-day instrumental projects in astronomy are subject to strong managerial constraints, in particular when they are carried out in the frame of large international and interdisciplinary projects under ESO's and ESA's control. Quality management requires configuration, costs, schedule and risks control to a high level, leaving only little room and resources for the development of new technology. One possibility to overcome this limitation is to separate R&D activity from specific project activity. This strategy has been followed by ESO, who 'outsourced' the R&D activity related to the E-ELT project to a dedicated European Union FP-7 project.

The main activities of PlanetS Institutes and Projects lies in the domain of astronomy and, more specifically, in that of exoplanets and planetary sciences. Because of the lack of infrastructures, competences and manpower, technological R&D cannot be (solely) conducted by these Institutes. On the other hand, most PlanetS Projects want to make use of cutting-edge technology to progress in their respective fields. This technology is not available ‘off-the-shelf’ and must be developed in collaboration with Industry. The development costs of high-end prototypes cannot be afforded by the industrial Partner alone, and because of the risks inherent to R&D, the commercial benefits cannot be ensured from the beginning. In addition, scientific requirements set by the 'end user' have to be converted into technical requirements of a prototype first, and a final product later. This task may be out of reach of both the PlanetS project and the industrial Partner. A third actor, as e.g. Technical Universities or specialized centers, may be required to make the link between the scientific requirements on one side, and the industrial product on the other side.

The main goal of the Technology Platform (TP) is to integrate the various PlanetS projects with specific R&D, which will be useful and in some cases even critical for the success of these sub-projects. It will offer the possibility to investigate the use of new technology, develop or adapt it for the specific project.

In the frame of PlanetS we aim at developing a strategy on Swiss scale, involving in a symmetric way Partners from Universities, Technical Universities, Industry and other institutions related to astronomy. The tool foreseen for this purpose is the Technology Platform. Its goal is to bring these Partners together, promote exchange of information and knowledge, develop and exploit synergies, and promote and coordinate R&D activities.

Figure 1: Technology Platform triggering the exchange of information and knowledge between the various actors and enabling R&D through seed funding.



2.2 Areas of intervention

The present strategy paper aims at describing two main areas of intervention requested by the KTT-strategy of SNSF to the NCCRs. The two areas are:

1) Technology transfer between private and public sector
   - Collaborations
   - Seed funding for R&D projects
   - Seed funding for Start-Up and Spin-Off creation
   - Industry grants and CTI projects

2) Knowledge transfer between private and public sector
   - Collaborations
   - Events and workshops
   - Expositions
   - Portals and data bases
   - Services

The TP shall be understood as a general service to any Institute of PlanetS and involve Technical Universities and Industry. It shall be a structure that 'enables' and provides 'seeds' for important activities such R&D, creation of spin-offs, exchange of information. Its top-level objectives are:

1. The TP should not aim at replacing funding agencies. It must be a structure that 'enables' and provides 'seeds' for important activities such R&D, creation of spin-offs, exchange of information.
2. The TP shall first (during the first years) focus on networking activities, for instance:
   a. Organize the collection of information and identification of topics of interest.

   b. Organize topical workshops.
   c. Create and support networking
   d. Define contact persons within the various Projects and Partners
   e. Organize data bases of people, machines, expertise and infrastructure

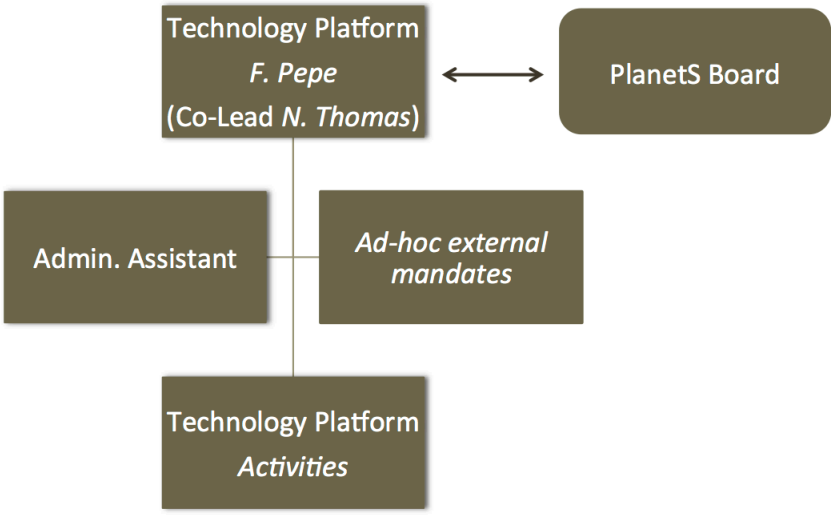
3. The TP shall select specific projects for seed funding taking advantage of interactions with the various PlanetS projects. It shall to promote:The TP should provide, in a second stage (>= year 2), seed funding for
   a. Coaching (or help) in creating spin-offs and or preparing CTI proposals
   b. Coaching (or help) in space qualification tasks
   c. R&D of high-risk high-gain components/technology
4. The TP shall emphasize personal relations, networking, more that technical and financial aspects. Exchange of people and ideas must be supported.

Chapter 3: Organization and Resources Allocation within the Technology Platform

3.1 Organization

1. A TP Director and the deputy are appointed by the PlanetS Board for the duration of the (approved) NCCR period of 4 years and is automatically re-conducted. They form together the *Directorate*. The NCCR Board can decide to change the composition of the Directorate at any moment. The TP director and the deputy can resign at any moment but remain operational until a successor has been appointed by the PlanetS Board. This transition period is limited to a maximum of 2 months.
2. The TP Director is formally responsible for the achievement of the general goals on long term (duration of PlanetS) and the execution of the specific tasks on the short term (year).
3. The TP Director has decision authority over all decisions taken within the rules defined in the present document. Decisions must however be taken unanimously with the Deputy Director. In case of conflict between the director and the Deputy Director, the latter may request that the decision is submitted to the PlanetS Board for approval.
4. Changes of goals, organization and rules can be proposed by the Director, the Deputy and Members of the PlanetS Board. They must be approved by the PlanetS Board and the present document must be updated accordingly to become applicable.
5. In order to accomplish specific and demanding tasks the Directorate can appoint external experts on the basis of mandates.
6. The Directorate members may request administrative support from their host institutes. The hosting institutes commit to provide at least a 10% of an administrative assistant each.

Figure 2: Organigramme of the Technology Platform



3.2 Use of funding

1. The TP is allocated a budget on a 4-year basis. The yearly budget is reviewed and approved by the PlanetS Board at the beginning of each administrative PlanetS year.
2. At least 50% of the allocated budget must be used for R&D projects and seed funding.
3. The Directorate decides about funding allocation for administrative tasks and mandates as long as 50% of the yearly budget is not exceeded.
4. The Directorate organizes calls for and allocates funding for R&D projects and other seed funding.
5. The Directorate reports about the use of funding to the PlanetS Board at the end of each administrative PlanetS year.

3.3 Seed funding for R&D projects

1. Proposals for R&D activities and seed funding related to PlanetS can be submitted at any time to the TP. The proposal must have a connection with at least one Project of PlanetS, in the sense that a possible benefit for the Project can be identified in advance.
2. The proposal can be submitted by anybody, in particular also third parties from Industry, Technical Universities and specialized centers, as long as they are supported by at least one PlanetS Project leader.
3. The Directorate prepares rules for the proposal submission and selection, which have to be approved by the PlanetS Board. The rules must be published on the TP web page.
4. The Directorate selects successful proposals, which request funding not exceeding 10’000 CHF.
5. In the case of proposals requesting funding exceeding 10’000 CHF, the directorate will select a short list of proposal compliant with the goals of the TP and submit it to the PlanetS Board. The PlanetS board will decide whether to allocate funding and to which project considering the recommendations by the Directorate.

Chapter 4: Action Plan

After consultation with external experts, the following high-priority tasks have been identified in the two main areas of intervention:

1) Technology transfer between private and public sector

a) Define paths and propose coaching (through eternal experts) for various activities, e.g. spin-off and start-up ideas, preparation of CTI proposals, space qualification activities, etc.

b) Support submission of patents issued for PlanetS-related activities.

c) Assign seed funding to R&D projects related to PlanetS activities and involving at least a PlanetS project and at least one partner from industry and technical universities

2) Knowledge transfer between private and public sector

a) Prepare a web portal describing goals and rules of the TP. Describe individual PlanetS projects, their interests and competences, technologies, contact persons. Also, the rules for applying for seed funding must be published.

b) Mandate an 'expert' to establish a list of Swiss-wide contacts in the fields related to astronomy/planets (SW, electronics, mechanics, optics, and combinations) containing:

- Company/Technical Universities/Research Institutes/Labs
- Competences and technologies
- Interests
- Contact persons

c) Organize 1 or 2 topical workshops per year on areas identified as 'interests' in a large number of companies/institutes. Possibly combine with other NCCRs, SwissPhotonics, or other organizations.

d) Create contacts with other NCCRs and organisations, such as MUST, EUROSEARCH, SSOM, local consulting entities like UniTec at UniGe and similar services in other Universities.

e) Mandate an expert for a Swiss-wide database containing available infrastructures and instruments (and conditions) in the previously mentioned entities. Could be done through a web form. Database will be made available to all the contributors.

f) Organize, enable or contribute to events that help improving the exchange of information and knowledge between all the parties, including students and futures collaborators.

The list of high-priority tasks is updated once per year and must be in agreement with the general goals of the Technology Platform.

Chapter 5: Appendix

5.1 Examples for the Technology Platform activities

5.1.1 External mandate

An external expert will be mandated by February 1st, 2015, to accomplish the task 2b). A preliminary Statement of Work foresees:

- Make a list of all the Swiss companies related to Space and Ground-based astronomy through the market of high-end components or R&D in mechanics, electronics, optics, SW, or a combination of them.
- Contact companies in order to
  i. Identify a person of contact, coordinates
  ii. Identify 'off-the-shelf' products
  iii. Identify areas of interest and R&D in which a collaboration is suitable
- Listen for suggestions and complaints with respect to knowledge and technology transfer with Technical Universities, Research Institutes and other NCCR or organizations.
- Produce a report on the status of the KTT in the areas related to astronomy and issue recommendations to PlanetS and the Technology Platform to enable and improve KTT.
- Propose a web-based solution to collect information of interest that could enhance the KTT (more the concept and a list of information items than the implementation of the tool, itself that would be subcontracted)
- Propose two topics for swiss-wide workshops, e.g. in collaboration with MUST, including a preliminary list of participants (the workshop would be organized on a separate mandate.

5.1.2 CTI project

Recently, a new CTI project 'Development of a highly efficient and miniaturized femto-second fiber-laser system at kHz repetition rates' proposed by the University of Bern and related to PlanetS has been approved. The Technology Platform will, within task **1a)** support these activities to further strengthen KTT in this area between PlanetS and industry.

5.1.3 R&D project

CSEM proposes, in collaboration with Project 3, to start the laboratory development of a stable and accurate calibration source for precise calibration of high-resolution spectrographs. The proposal foresees also to include industry in the early phase in order to identify possible commercial slots. If approved, this project will be placed under task **1c)** of the Technology Platform.