



Personal Views on R&D Cooperative Projects with Industry

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Presentation Outline

- Formal Mechanisms for Interacting with Industry
- A Recent Experience on Industrial Academic Collaboration
- Traits of Cooperative Projects
- Major Benefits from Industrial-Academic Collaborations
- Major Challenges
- Final Remarks



Formal Mechanisms for Interacting with Industry

- The Industrial Liaison University Office
- Non-profitable Foundations promoting technology transfer



Formal Mechanisms for Interaction with Industry

Advantages

They allow researchers:

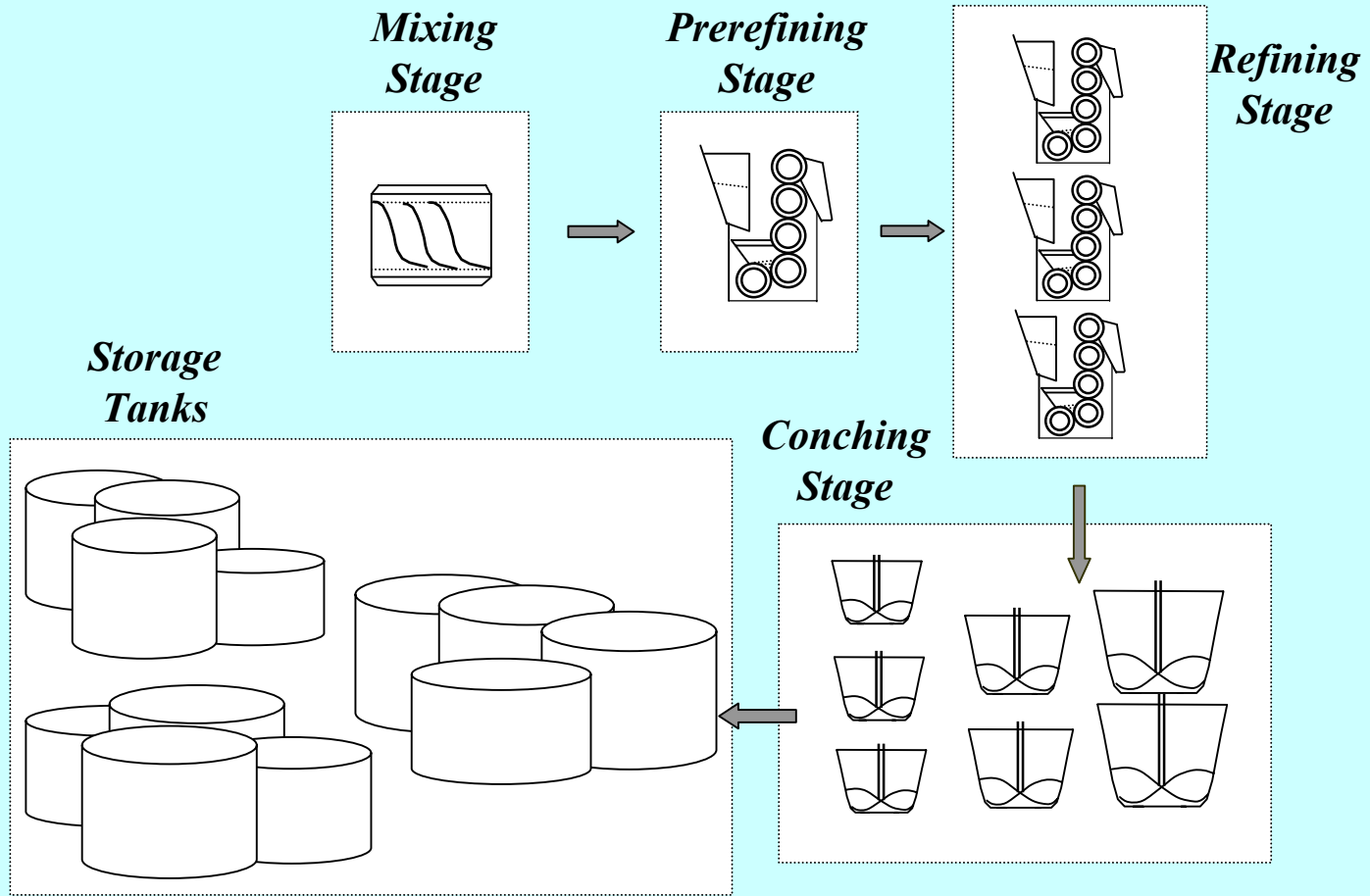
- To execute R&D cooperative projects using university facilities and equipments.
- To sign contracts with industry without running a company.
- To have administrative support for billing, payment claims and legal assistance.



A Recent Experience on Industrial Academic R&D Collaboration

- **Project Goal**
Development of a scheduling support system for a chocolate paste production facility
- **Project Team**
Four-member team, two from the academia and the other two from industry
- ***Plant Output***
Chocolate pastes (five classes or families)
Plain / White / Milk Chocolate, Couvertures, Fillings

Chocolate Paste Plant Layout





A Recent Experience on Industrial Academic R&D Collaboration

Plant Structure

- A mixed multiproduct plant
- Four production lines
- Three of the lines are batch-oriented and equipped with batch and semicontinuous units
- The remaining one is a continuous production line



A Recent Experience on Industrial Academic R&D Collaboration

- ***Product Destinations***

- Moulding machines in a neighboring plant.
- Heated trucks transporting chocolate pastes to other food manufacturing plants.

- ***Problem Size***

200 batches & 40 different pastes each week, 46 tanks,
16 conching units



Traits of Cooperative Projects with Industry Based on Personal Experience

- Industrial companies are just interested in effective tailor-made products and their development time & costs.
- Developments are fully made in the academic environment under industrial supervisory control.
- Ph.D.'s are hardly participating on the project team from the industrial side.



Traits of Cooperative Projects with Industry Based on Personal Experience

- Industrial team members are responsible for:
 - Providing a detailed description of the problem.
 - Supplying all the required problem data.
 - Making product assessment & evaluation
- Detailed product features are often defined by the team during the development phase.



Traits of Cooperative Projects with Industry Based on Personal Experience

- The methodology is chosen by the academic team based on both problem complexity and timing constraints.
- A prototyping approach is usually followed.
- Industrial-academic interaction is stronger at the project start. On average, a pair of monthly meetings.
- Project success means that the desired product integrated to other company's systems is on duty at the plant mostly on schedule.



Major Benefits from Cooperative Projects with Industry

- It gives the opportunity to test problem-solving methodologies in real-world industrial environments.
- It provides an inside picture of how the issue is handled in an industrial company.
- It helps identifying new key problem aspects, usually overlooked in the literature, and even new R&D projects.



Major Challenges in the Interaction with Industry

- **Within the academic environment**
 - Postdoctoral fellows hardly participate in R&D cooperative projects.
 - A cooperative project usually implies a lot of time and effort during a one-year period.
 - The academic performance is mostly determined by the number of publications in indexed journals.



Major Challenges in the Interaction with Industry

Stemming from the industrial environment **At the Project Start**

- Very tight time constraints
- Vague project goals and objectives
- Lack of a complete problem description
- Exclusivity



Major Challenges in the Interaction with Industry

Stemming from the industrial environment

During system development

- Key information is provided after a demo of the first prototype.
- Frequent changes in the personnel involved in the project
- Lack of dedication to the project in favor of day-to-day activities
- Lack of commitment from high-level management



Major Challenges in the Interaction with Industry

Stemming from the industrial environment **During system assessment and evaluation**

- Integration with other company's systems
- Attainment of an error-proof system
- No feed-back on systems' performance other than failures



Major Challenges in the Interaction with Industry

Stemming from the industrial environment After transferring the system

- No arrangement for system maintenance and support
- Lack of continuity in the development efforts
- Request for resuming collaboration on the same issue and location at any time
- A single-user license is provided to the company. New licenses require the agreement of both parts.



FINAL REMARKS

From my viewpoint, the major concerns on industrial academic collaborations are:

- **Explicit academic recognition of such activities**
- **Continuity in the interaction beyond the project completion**
- **Joint planning on future collaborations**
- **Alliance with software developing companies or generation of academic spin-off companies**