

**FIG Working Week**  
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 Marrakech, Morocco  
 May 18-22, 2011

# Technology Innovation Management in Indonesia Construction

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 Affiliation:

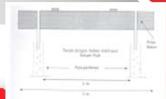
 **INDONESIA CONSTRUCTION EXPERTS ASSOCIATION**

 **INSTITUT TEKNOLOGI INDONESIA**



- BACKGROUND
- INDUSTRIALIZATION OF CONSTRUCTION TECHNOLOGY INNOVATION
- INDUSTRIALIZATION OF CONSTRUCTION TECHNOLOGY INNOVATION IN INDONESIA
- CONCLUSION

**OUTLINE**







- Low Competitiveness of Indonesia for **weak technology capabilities** → **Ministry of Public Work (MPW) Concerns for construction sector**
- MPW conducts researches and develop technology innovation through its **R&D units** in sectors of settlements, road and bridge, and water resources for decades
- An Act (UUJK 18/1999) concerning Construction Services effective since 1999 → **Agency of Construction Services Development (Lembaga Pengembangan Jasa Konstruksi-LPJK)** to conduct technology innovation development
- A special unit (**Agency for Construction and its Human Resources Improvement PUSBIKTEK- BPKSDM**) for construction technology innovation development was also founded in MPW since 2000s to facilitate the industrialization process between the ministry's research units and industry as a respond to the act.

→ **no progress has been made on technology innovation implementation in the industry**

**BACKGROUND**



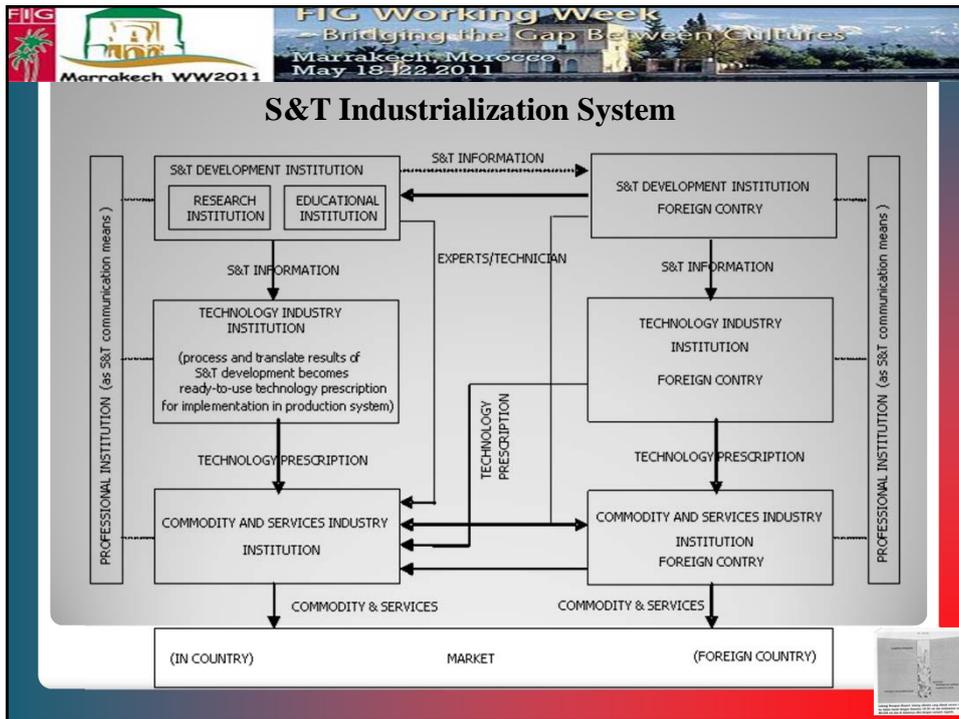




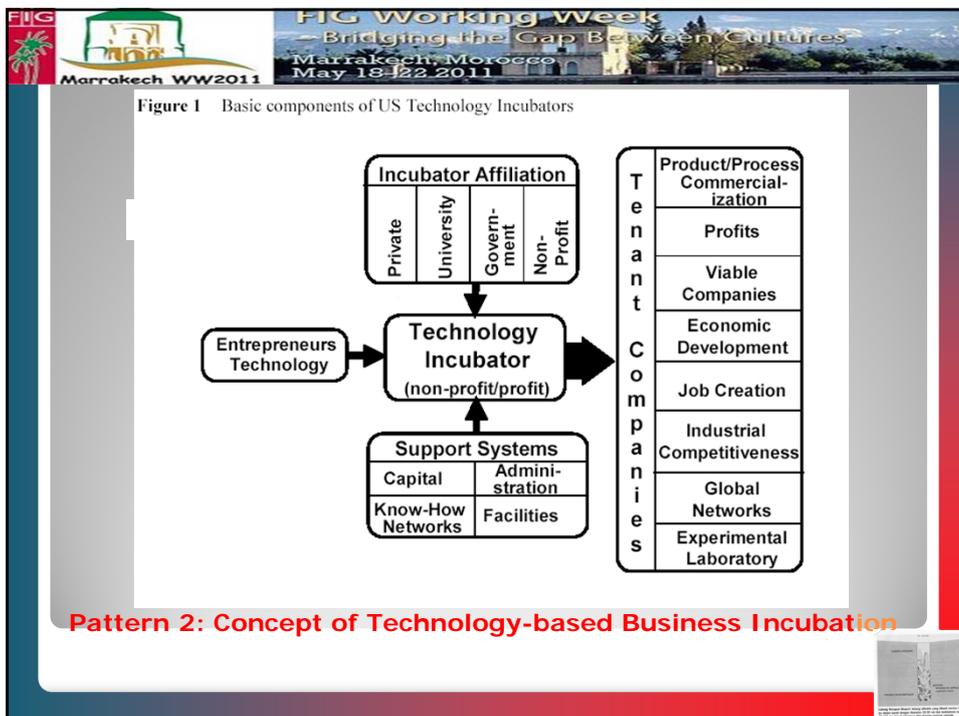
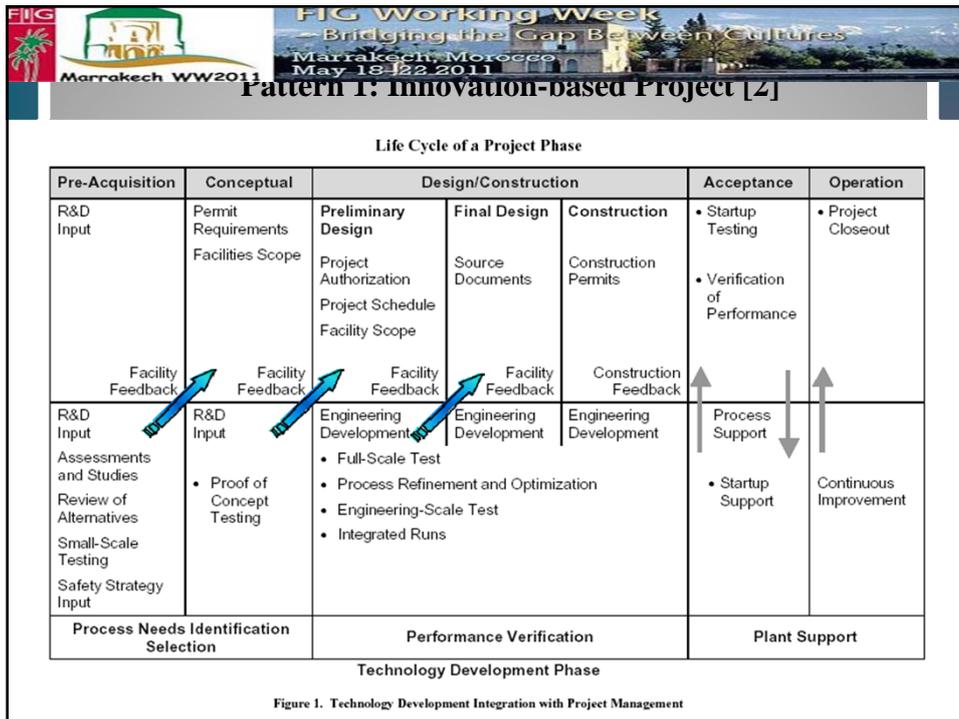
- **New Rubber (Synthetic Latex/Polymer) Asphalt (MPW Road R&D Agency)**
  - More durable than conventional asphalt
- **New Mix of ASBUTON (Indonesian Asphalt) (MPW Road R&D Agency)**
  - To make quality of ASBUTON competitive with imported oil asphalt
- **New Method of Expansive Soil Improvement (MPW Housing R&D Agency)**
  - Using Paddy Ash (Abu Sekam Padi) waste
- **New Technic of Biopores (Bogor Institute of Agricultures R&D)**
  - To conserve ground water and solve flood problems

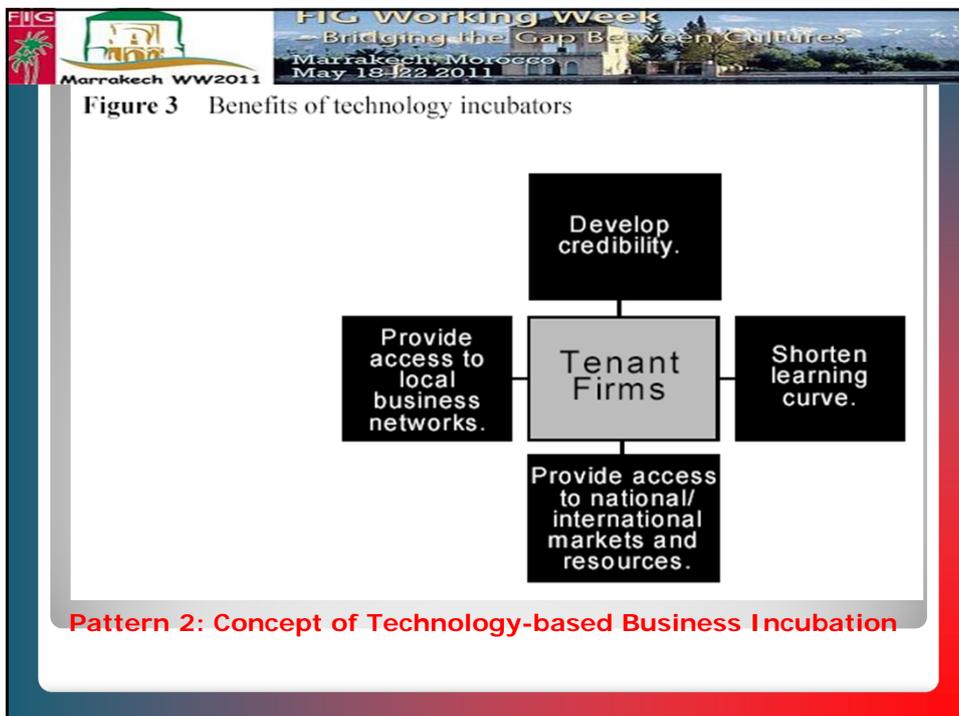
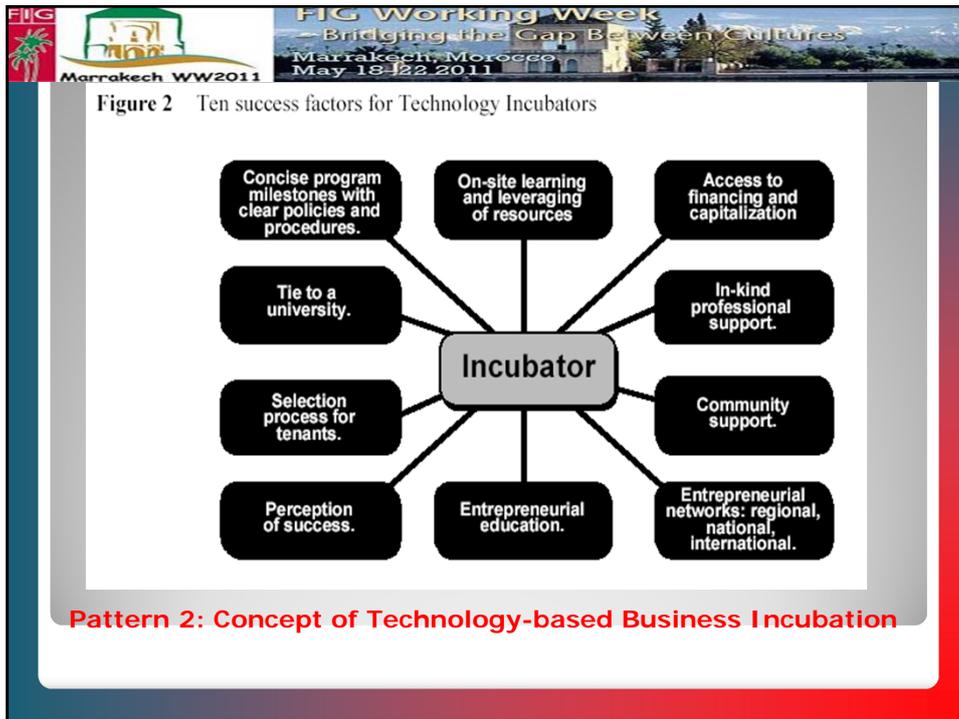
**Examples of Innovation**





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- ### INDUSTRIALIZATION OF TECHNOLOGY INNOVATION
- Three alternative approaches:
    - “Innovation-based Projects“
    - “Technology-based business incubation“
    - “Partnership“







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## EXAMPLES OF TECHNOLOGY INCUBATORS

- **Concept of Technology-based Business Incubation**
  - **Austin Technology Incubator**
    - Services (by more than 75% of the respondents) offered by technology incubators (National Business Incubation Assc:NBIA):
      - links to higher educational institution/ Research Center
      - assistance with **business** basics
      - marketing assistance
      - accounting/financial management
      - investor and strategic partner linkages
      - networking activities




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## EXAMPLES OF TECHNOLOGY INCUBATORS

- **Tech Bussiness Incubator (Mid Missouri)**
  - Assures a pathway for forming and retaining companies that arise from innovation, primarily at or with University/R&D Centers.
  - Specializes in companies that offer products or services based on proprietary technology in fields such as life sciences, engineering and information technology
  - Incubators translate research investment into higher paying jobs and attract private capital investment
  - Colleges and research units are actively participating in the incubator initiative. Science and engineering units are likely to produce most of the innovations that will result in new business ventures







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**EXAMPLES OF TECHNOLOGY INCUBATORS**

- **Concept of Technology Incubators**
  - Super Incubator (The Ayer Islands, U of Maine)
    - R&D facilities, several target industries: composites and precision manfctrng, space tech, marine science, etc.
    - Aggressive High Technology commercialization center
    - Help grow High tech-companies: mngmnt, finance, tech, and prototyping new products.
    - Facilities incl: Commercial, Exhibition, Conference etc.
  - BioScience Incubator (San Jose, Silicon Valley)  
 6.5 Mill USD
    - To support development of new tech and entrepreneurs
    - well-equipped scientists, start up companies → leader in tech and invtn
    - Close to industry and research company



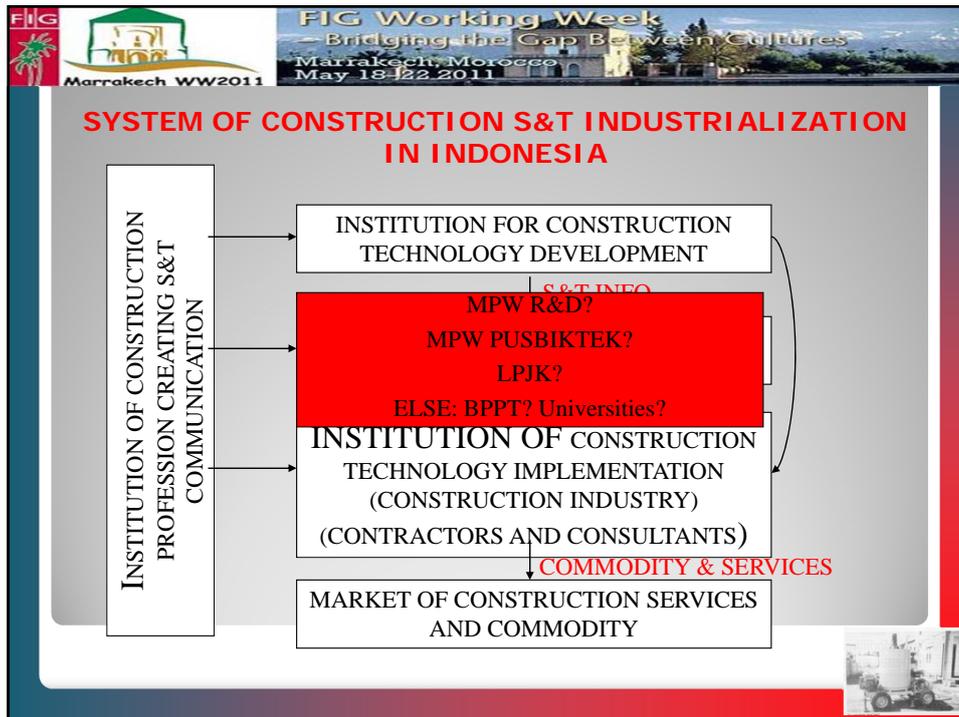




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- **Pattern 3: "partnership" or "collaboration":**
  - is collaboration and synergy of all stakeholders (UNIVERSITY/RESEARCH INST , GOV, INDUSTRY) in creating and implementing a technology innovation, so that the process of industrialization is a "win-win solution", because all parties benefit from this activity, so that the S&T industrialization can take place with effective and efficient.
  - Most countries (Canada, U.S., Ireland, UK) operate a research and industrialization of research results using partnership or collaboration programs with formal institution authorities

**INDUSTRIALIZATION OF TECHNOLOGY INNOVATION**



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- Existing condition assesment:
    - MPW R&D Centers (road and bridges, settlements, water resources) have produced a lot of new technology, but has not been so successful in its industrialization efforts because of the funds due to the limited authority in their formal functions.
    - MPW PUSBIKTEK has formal authority but no proper HRD, budgets, and networks that are still limited due to its present formal Duties and Function (MPW decree)
    - LPJK which is a collaborative organization is busy only on the program of construction expert certification policies and practices, and not on programs of industrialization of research results.
- ### INDUSTRIALIZATION OF CONSTRUCTION TECHNOLOGY INNOVATION IN INDONESIA
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**Existing condition assesment: (Cont'd)**

- Universities (faculty/academic researchers) are focusing more on basic research, and not on applied research.
- Formal authority for industrialization the Government Agency of Technology Development and Implementation (BPPT) through Business Technology Center (BTC) (Incubators) and the Education Ministry has put forward a variety of collaborative research program, but the results in the field of construction has not been significant.
- Researchers work individually, and they do not collaborate with industry with the orientation only on their academic position promotion.

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**Existing condition Assesment: (Cont'd)**

- Industries, through company associations, do not prioritize research and application of its results yet.
- Individually, some industries have been successful to find and implement new technology/methods/process in the field through their R&D Centers, because the research problem is usually the problems faced in the field or in the projects that are currently running or completed

→ Individually, there are few success, but in an integrated and more broadly, it seems efforts on S&T innovation industrialization in Indonesia has not yet appeared results.





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- Results of the survey in some R&D Centers in various government institutions, universities, and companies in Indonesia:
  - the most often effort: to provide guidance of innovation transfer to the target users, especially in terms of management, human resources, and equipment improvement.
  - The most common problem found in the effort is problem of
    - funding and formal function of institutions that have not been emphasized on industrialization of construction technology innovation efforts.
  - Hence the solution proposed that is most frequently cited is improvement of institution function beside the improvement of resources and research equipment.

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- FGD on S&T industrialization attended by various stakeholders element concludes:
  - The process of R&D is still more oriented to running programs of each institution only, and still not oriented to the results of the implementation and the industrialization process of R&D result
  - R&D Center of MPW affirms that its result is still very limited, and the industrialization is limited on projects in the Minsitry, and it is also still very limited. It is expected of increase in the future with the improvement of system and resources of industrialization of construction technology innovation.
  - BTK Pusbiktekk also stressed and confirmed that the programs that run mostly in the areas of education, whereas in the case of industrialization of construction technology innovation programs are still limited to cooperation with universities that have a technology innovation that need to be socialized.

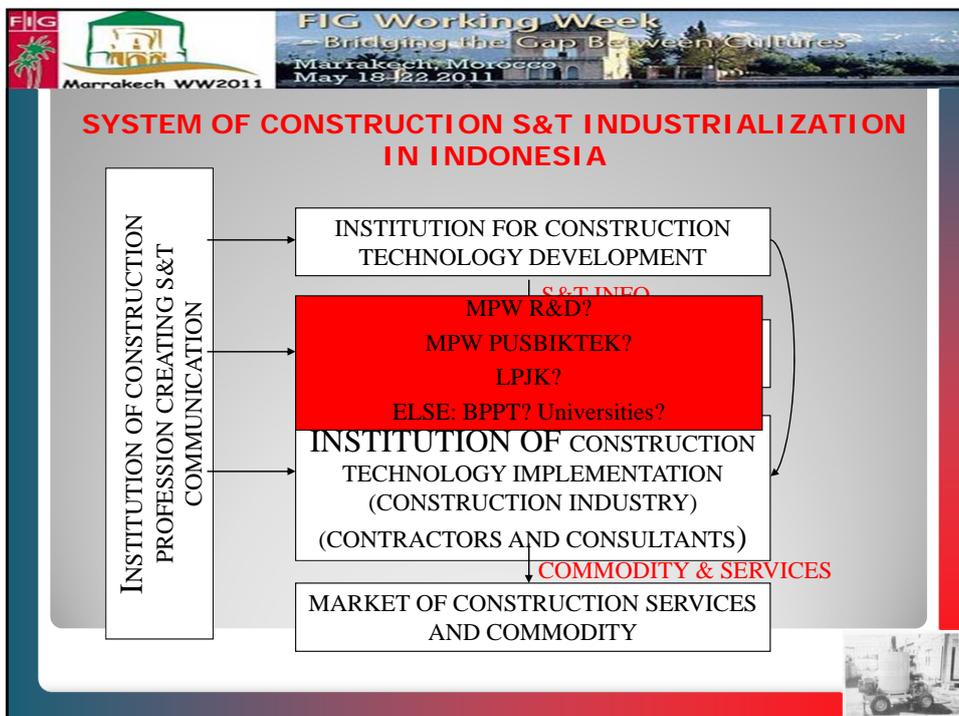






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- FGD on S&T industrialization attended by various stakeholders element concludes : (Cont'd)
  - In terms of **researchers** themselves, representatives from the Ministry of Transportation expect the profession of researchers find **improvements** both in terms of status and respect → **researchers union**
  - Activities of Business Technology Center (BTC) of BPPT are confirmed by its representative in the discussion still no progress





**INDUSTRIALIZATION OF CONSTRUCTION TECHNOLOGY INNOVATION IN INDONESIA**

- Proposed direction of structured action in the future:
  - Preparation of the Roadmap is highly recommended to be implemented as soon as possible in the future.
  - BPKSDM and LPJK institutions are considered the "eligible" (formal function's perspective, the nature of the organization, mandate of Act 18/1999 on Construction Services, etc.) institutions to play the role of industrialization of construction technology innovation in construction;
  - The industrialization of construction technology innovation long-term programs should be gradually adjusted to the conditions and readiness of institutional providers in three phases:
    - Phase I (preparatory phase; 2010-2012) → MPW Pusbikte
    - Phase II (stage of consolidation / The; 2012-2017) → MPW Pusbikte
    - Phase III (stage of development; 2017-2022) → LPJK







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- Proposed direction of structured action in the future: (Cont'd)
  - MPW Pusbikte and LPJK strategic plan, program and activities are analyzed and compiled:
    - human resources (especially the preparation of researchers)
    - research facilities
    - the collaboration of all stakeholders
    - structured efforts of industrialization of construction technology innovation such as technology management, partnership, and incubation





**INDUSTRIALIZATION OF CONSTRUCTION TECHNOLOGY INNOVATION IN INDONESIA**

- MPW proposed changes (R&D Centers and PusbikteK):
  - must be developed to the direction of technology in accordance with market demand in the construction industry
  - should focus also on aspects of its management and marketing
  - must consider market demand and networking/partnerships with other research institutions, both in the environment of the Ministries and private → avoid duplication
  - also need to take inventory needs of CTI in the industry, that is the conduct of intensive interaction with stakeholders, consultants, contractors and manufacturers of building materials and property developers as the end-users
  - Socialization and marketing of CTI products should be conducted professionally (interesting and easily understood) and continuing like the ads of commercial products consumer



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- Proposed direction of structured action in the future: (Cont'd)
  - Phase I: MPW PusbikteK is to reinforce its policy, formal function, strategic plan expansion, programs and activities related in aspects of industrialization of construction technology innovation → it is ready to perform the function as a short-term action plan for the year 2012
  - Phase II:
    - increased capacity of Institution Organizer of industrialization of construction technology innovation on MPW PusbikteK,
    - continued expansion through consolidated system of coordination with stakeholders,
    - start of industrialization through the application of the model approach, including project-based approach, partnership, and business incubation
  - Phase III: LPJK whose formal functions in Act No. 18/1999 among others is industrialization of construction technology innovation in construction should be ready in 2017 after taking over, expand, and improve the task from MPW PusbikteK.



**CONCLUSION**

- Implementation of industrialization of construction innovation in Indonesia still has not been brisk.
- LPJK, universities, companies, government institutions (BPPT, MPW Pusbikte) do not touch the efforts on industrialization of research results.
- To overcome this situation, a recommendation of the direction of the development of structured action of industrialization of innovation in the of field construction services in the future is developed based on current readiness of each institution to play the role of industrialization of innovation in construction technology, including MPW (Pusbikte) and LPJK.
- LPJK is to be the final institution for that strategic role in the long term for the year of 2017 and beyond.

→ The final result should be the improvement of Indonesia world competitiveness in technology innovation.

→ Lesson learnt for similar countries




**THANK YOU  
TERIMA KASIH**

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