ENGAGING BUSINESS AND INDUSTRY

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DIRECTOR GENERAL FOR INNOVATION STRENGTHENING
MINISTRY OF RESEARCH, TECHNOLOGY AND HIGHER EDUCATION
1. NAWACITA AND INDONESIA COMPETITIVENESS
2. THE CURRENT CONDITIONS OF INDUSTRY IN INDONESIA
3. THE CURRENT CONDITIONS OF RESEARCH INSTITUTION & UNIV
4. STRENGTHENING INNOVATION PROGRAM
5. THE PROGRAM OF DG FOR INNOVATION STRENGTHENING
NAWACITA AND INDONESIA COMPETITIVENESS
9 (Nine) Agenda Priority of Development (Nawa Cita)

1. Returning the state to its task of protecting all citizens and providing a safe environment;
2. Developing clean, effective, trusted and democratic governance;
3. Developing Indonesia’s rural areas;
4. Reforming law enforcement agencies;
5. Improve quality of life;
6. Increasing productivity and competitiveness;
7. Promoting economic independence by developing domestic strategic sectors;
8. Overhauling the character of the nation;
9. Strengthening the spirit of “unity in diversity” and social reform
Triple Helix Synergy In National Development Towards Vision Indonesia 2045

THE AGENDA OF NATIONAL DEVELOPMENT

SISTEM INOVASI NASIONAL

ADDED VALUE

ADDED VALUE ACADEMIC

ADDED VALUE SOCIAL CULTURE

ADDED VALUE ECONOMY

ADDED commercial

VISON OF INDONESIA DEVELOPMENT 2045

ECONOMIC MACHINE

Machine of government

- A holistic policy
- Critical Occupation List (COL), for ASN
- Sustainable development
- Independence and competitiveness
- Good governance and RB e-Gov (digital gov)

National Industry development

- Utilization of digital tech

Industrial Revolution 4.0

Critical Occupation List (COL), for the workforce

The level of industry productivity and competitiveness

Technology-based entrepreneur (incubation, STP, TTO, teaching industry)

Utilization

VISION OF INDONESIA DEVELOPMENT 2045
The Creation of added value based competitive (natural & human resource, science & Tech)

Reforming the NKRI, developing Indonesia to secure, peaceful, justice, and democratic, by enhancing prosperity

Consolidating the reformed Indonesia, increasing quality of human resources, capacity building in science & technology, strengthening economic competitiveness

Consolidating overall development by emphasizing enhancement of economic competitive advantage based on available natural resources, quality of human resources, and capability in science and technology

Realizing Indonesia that is self-reliant, justice, and prosperity, through acceleration of development in all fields, with an economic structure that is solid based on competitive advantage
GLOBAL COMPETITIVE INDEX – INDONESIA
2015-2016

Rank at 37 of 140 Countries

| 1st pillar: Institutions | 4.1 |
| 2nd pillar: Infrastructure | 4.2 |
| 3rd pillar: Macroeconomic environment | 5.5 |
| 4th pillar: Health and primary education | 5.6 |
| 5th pillar: Higher education and training | 4.5 |
| 6th pillar: Goods market efficiency | 4.4 |
| 7th pillar: Labor market efficiency | 3.7 |
| 8th pillar: Financial market development | 4.2 |
| 9th pillar: Technological readiness | 3.5 |
| 10th pillar: Market size | 5.7 |
| 11th pillar: Business sophistication | 4.3 |
| 12th pillar: Innovation | 3.9 |

<table>
<thead>
<tr>
<th>Higher education</th>
<th>Technology Readiness</th>
<th>Business Sophistication</th>
<th>Innovation</th>
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<tbody>
<tr>
<td>5th pillar</td>
<td>Score 4.5 Rank 65</td>
<td>9th pillar Score 3.6 Rank 85</td>
<td>11th pillar Score 4.3 Rank 36</td>
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<tr>
<td></td>
<td><strong>12th pillar</strong></td>
<td></td>
<td><strong>Score</strong> 3.6 <strong>Rank</strong> 39</td>
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**Pillar: Technological Readiness and Innovation**

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Score</th>
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<th>Indicators</th>
<th>Score</th>
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<tr>
<td>9th pillar: Technological readiness</td>
<td>3.6</td>
<td>85</td>
<td>12th pillar: Innovation</td>
<td>3.6</td>
<td>39</td>
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<tr>
<td>Availability of latest technologies</td>
<td>4.9</td>
<td>72</td>
<td>Capacity for innovation</td>
<td>3.9</td>
<td>30</td>
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<tr>
<td>Firm-level technology absorption</td>
<td>4.9</td>
<td>56</td>
<td>Quality of scientific research institutions</td>
<td>3.9</td>
<td>56</td>
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<tr>
<td>FDI and technology transfer</td>
<td>4.8</td>
<td>61</td>
<td>Company spending on R&amp;D</td>
<td>3.9</td>
<td>25</td>
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<td></td>
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<td>Univ-industry collaboration in R&amp;D</td>
<td>4.2</td>
<td>40</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Gov’t procurement of advanced tech products</td>
<td>4.0</td>
<td>29</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Availability of scientists and engineers</td>
<td>4.3</td>
<td>51</td>
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<td></td>
<td></td>
<td></td>
<td>PCT patents, applications/million pop.*</td>
<td>0.1</td>
<td>101</td>
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</table>
THE CURRENT CONDITIONS OF INDUSTRY IN INDONESIA

FROM THE PERSPECTIVE OF TECHNOLOGY AND PRODUCT DEVELOPMENT
The issues:

1. Market
   - The absorb of industry to the existing innovation is still low and has not been optimal.

2. Integration Research-Industry
   - The research does not fit to industry need because it is not supported from industry requirement.

3. Higher Education
   - The supporting infrastructure of research and development is really limited and need the big cost.

Program of Ristek-Dikti:

- Forefront Bridging system:
  - Mapping industry potential
  - Curasy system of industry proposal and supporting funding

- Regular Partnership system:
  - Business matching
  - Policy of transfer technology, etc.

- Directional Support system:
  - Selection system of Research and Funding
  - Center of incubation and prototyping center
<table>
<thead>
<tr>
<th>No</th>
<th>Weaknesses</th>
<th>Policy and Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Low Skill Labor</td>
<td>- Quality management for education</td>
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<td>- Revitalize of Recruitment</td>
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<td></td>
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<td>- Revitalize of Curriculum</td>
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<tr>
<td>2</td>
<td>Innovation Strategy</td>
<td>- Scientific Publication</td>
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<tr>
<td></td>
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<td>- Supporting budget for submitting to international Journal</td>
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<td></td>
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<td>- Development model of training for scientific publication</td>
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<tr>
<td></td>
<td></td>
<td>- Budgeting</td>
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<td></td>
<td></td>
<td>Coordination in conducting the program to make efficiently in the budget system</td>
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<tr>
<td></td>
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<td>- University/industry collaboration</td>
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<td></td>
<td></td>
<td>- Consortium for center of excellent</td>
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<tr>
<td>No</td>
<td>Weaknesses</td>
<td>Policy and Strategy</td>
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<tr>
<td>1</td>
<td>Lack of industrial independence</td>
<td>- Strengthen the utilization of human resources as needed in industry,</td>
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<tr>
<td></td>
<td></td>
<td>- the mobility of researchers / engineers into the industry,</td>
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<td>- the award for producer of intellectual property rights (IPR),</td>
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<td></td>
<td>- the industry take advantage of R &amp; D Results as optimally as possible,</td>
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<td></td>
<td></td>
<td>- do transfer of technology to the scheme Turn Key Project, Licenses, FDI (FDI),</td>
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<td></td>
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<td>- Joint Production, Off Set, BOT,</td>
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<td>- strengthening audit technology institutions,</td>
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<td></td>
<td></td>
<td>- select technology For the independence of Industry,</td>
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<tr>
<td></td>
<td></td>
<td>- dissemination and</td>
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<tr>
<td></td>
<td></td>
<td>- Diffusion Technology R &amp; D results and make changes paradigm &quot;OBJECT&quot; to &quot;SUBJECT&quot;.</td>
</tr>
</tbody>
</table>
THE EXAMPLE OF INDUSTRY BASED ON FOCUS PRIORITY OF RISTEKDIKTI

- **FOOD**
  - BIOFARMA

- **ENERGI**
  - PLN, PERTAMINA

- **TRANSPORTATION**
  - PT. INKA, PT. KAI

- **TEKNOLOGI INFORMASI**
  - PT. INTI

- **DEFENCE, ADVANCED TECHNOLOGY**
  - PT. DIRGANTARA INDONESIA, PT. PINDAD

- **HEALTH AND MEDICINE**
  - PT. BIOFARMA
Industry Revolution

**Industry 1.0**
Steam engines, Hydropower, wind, and solar
1784

**Industry 2.0**
Electrical energy for mass production
1870

**Industry 3.0**
Information technology and electronics applied to automatic production systems
1969

**Industri 4.0**
Digital technology, massive wireless & massive data technologies are integrated with manufacturing activities

Now
THE CURRENT CONDITIONS OF RESEARCH INSTITUTION & UNIV

FROM PERSPECTIVE OF RESEARCH AND DEVELOPMENT WHICH DO NOT FIT TO INDUSTRIAL NEED
THE GAP AMONG
INDUSTRY, GOVERNMENT & ACADEMICIAN (ABG)

GOVERNMENT
• The low coherence - Intersectoral policy
• Political will - lack of pro-government on the utilization of R & D results
• Policy and regulatory agencies do not support the government budget
  lack of incentive? government

INDUSTRY
- Dominated by companies with a request or a low innovation absorption
  The high cost of R & D facilities
  Limitations HR R & D

R &D, GOV & UNIVERSITY
Mission and culture of R & D institutions
Professionalism? Technology services
The study does not fit the needs of the industry.
Obscurity tenure policy IPR / licensing
Low Budget of R & D

- Weak Channels Transaction and partnership
- Different interests
- Communication barriers and facilitation (the information system of R & D results and information clearing-house)
More innovation takes place outside the university.

Innovation “Back-to-Campus”
THE ISSUES OF RESEARCH AND INNOVATION IN UNIVERSITY

Current condition

- University conducts research as an independent activity, without cooperating with industry
- Research at university ends in the form of report and/or publication
- University has no industrial partners (industry concorcium) for its innovation
- University has not yet implemented innovation management function, from upstream to downstream
- University produces locally innovation production on small scale as a result of a faculty or prodi experiment
- Innovation in the UNIV is not tested so it is not trusted by the industry

The expected conditions

- University cooperates with industry in doing research to produce innovation
- Research at University ends with a competitive product of innovation
- University has an industrial partner (industry consortium) for its innovation
- University is able to manage innovation, from upstream to downstream through various models
- University is able to produce innovations that are mass produced by industry
- University produces innovative industrial competitiveness

Institutionalize the system Innovation Management In University

Development model of innovation in univ (partnership with industry teaching industry, incubation unit, TTO etc)

Synergy Program and Optimalyzation the resources of Strengthening innovation at University

Integration of strengthening Innovation at university

- Teaching Industry
- One univ one Innovation
- Technology Transfer Office
- Mobility of HR R&D
- Business Incubator
- Other innitiative
STRENGTHENING INNOVATION PROGRAM
STRATEGIC PROGRAM OF MINISTRY OF RESEARCH TECHNOLOGY AND HIGHER EDUCATION

The qualified institution
1. Univ institution development
2. Univ Institution building
3. Strengthen & develop Research Institution
4. Development Sains Park& Tech

INNOVATION
1. Development Innovation system (Sinas/SIDa)
2. Develop & Management PP Iptek
3. Develop PPBT (Univ & Business)
4. Strengthen Innovation Industry & Innovation univ in Industry

RESEARCH AND DEVELOPMENT
1. Research quality in university
2. The increase of IPR
3. Research in Industry
4. Research and Development Policy

THE QUALIFIED RESOURCE
1. Human Resources Dev in Univ (S2&S3)
2. Infrastructure Development in Univ&science tech
3. The increase Human Resource Qualification in Univ & Human Resource of research & Development

SKILL EMPLOYMENT
1. Increase Learning Quality
2. Learning development of entrepreneurship, vocation education & politechnic
3. Increase quality service of higher education

COMPE TITIVE NESS
(1) Innovation Indeks
(2) University Indeks &
(3) Bureaucratic Reform indeks
PLATFORM OF STRENGTHENING INNOVATION

REGULATING

Formulation and Fix of Policies, Sectoral Policy Harmonization

To increase the Capacity and Capability, Mediation, Diffusion and Dissemination, Standardization, Certification.

EXECUTING

EMPOWERING

Funding Innovation: Collaboration among Industry, Startup, Cluster Innovation, Teaching Industry
### THE INITIATIVE FOR STRENGTHENING NATIONAL INNOVATION

<table>
<thead>
<tr>
<th>Regulating</th>
<th>Executing</th>
<th>Empowering</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mobility of researcher / engineer/lecturer to Industry</td>
<td>1. Roadmap of innovation product priority year 2025</td>
<td>1. Development/Strengthening of Intermediation Unit/ Technology Transfer Office – TTO</td>
</tr>
<tr>
<td>2. Reward for researcher/ engineer/lecturer → valuation of credit point</td>
<td>2. Facilitate of innovation funding</td>
<td>2. Development of Help Desk of innovation consultation small medium enterprise</td>
</tr>
<tr>
<td>4. Flexibility research funding, development and innovation through Block Grant Scheme</td>
<td>b. Univ Innovation in Industry</td>
<td>4. Strengthening the standardization based on R&amp;D result; strengthening the certification institution</td>
</tr>
<tr>
<td>5. Fiscal and Non Fiscal incentive</td>
<td>c. Start up company tech based</td>
<td>5. Strengthening the collaboration between State own company and Industry as an innovation trigger</td>
</tr>
<tr>
<td>6. Government Procurement for pre-commercialize of R&amp;D product result</td>
<td>d. Innovation of start up company tech based at univ</td>
<td>6. Regionalisation of Univ Innovation</td>
</tr>
<tr>
<td>8. The obligation of state univ to produce the innovation product every year</td>
<td>4. Development of Innovation Concorcium</td>
<td>8. Strengthening diffusion and dissemination; exhibition and promotion, business gathering</td>
</tr>
<tr>
<td>9. Harmonization of sectoral policy</td>
<td>5. Development of interaction area of Industriy(STP, Innovation Cluster)</td>
<td>9. Strengthening of international cooperation (G to G; B to B)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10. Strengthening of innovation balance and competitiveness</td>
</tr>
</tbody>
</table>
THE ALTERNATIVE INSTRUMENT OF POLICY FOR STRENGTHENING THE INNOVATION SYSTEM

- Sinkroninze & policy coherence:
- Applied constitution related to S&T and its derivative
- The mainstream of S&T
- Policy of Transfer Tech
- Policy of Intelectual Property Right and Publication
- The consistency of job performance measurement
- Roadmap of competition and Research and Development

GOVERNMENT
Strengthen the function of motivation, stimulate, facilitate, and create the conducive atmosphere for strengthening innovation system

Put the institution of research and dev and universites to strengthen the innovation of supporting capability

R &D And Univ

To stimulate the development of company capacity and investment in innovation activity

INDUSTRY

- Start up company based tech
- The usage of gov need and state-own company need
- Prototyping center
- Testing and certification center
- R and D Program strategis
- strategic Alliances between R & D institutions and company
- start up capital support through capital ventura

intermediation institutions STP, incubator center of transfer tech, center of S & T Promotion, the partnership center

- Tax incentive
- matching fund guidance
- loan guarantee
THE PROGRAM OF DG FOR INNOVATION STRENGTHENING
The strengthening of National Innovation is holistically and integratively managed as a system that "operates" based on a focused, consistent and sustainable development roadmap to support the creation of added value to strengthen the nation's competitiveness and independence.
THREE MAIN COMPONENTS OF REGIONAL INNOVATION CLUSTER

1. SUBJECT
- REGIONAL GOVERNMENT
- BUSINESS
- UNIVERSITY
- COMMUNITY

MODEL QUADRUPLE HELIX

2. INSTRUMENT
- Business Model
  - Canvas Model (Osterwalder)
- Technology Acquisition
  - Appropriate
  - Diffusion
- SUPPLY & VALUE CHAIN
  - SCM
  - VCA

3. OBJECT
- KATSINOV
  - Instrument/measurement tools of innovation product
MANAGEMENT OF INNOVATION FUNDING ARRANGEMENT

INPUT

Parameter:
- The number of Funding
- The number of Proposal

OUTPUT

Parameter:
- The number of Funding
- The number of Proposal

Output:
- Prototype Enhancements
- Testing
- Certification
- Initial Production

OUTCOME

Parameter:
- The number of Funding
- The number of Proposal

Output:
- Prototype Enhancements
- Testing
- Certification
- Initial Production

Outcome:
- Production
- Market Analysis
- Business Model
- Entry to the Market

OUTCOME+ BRANDING

Parameter:
- The number of funding
- The number of Proposal

Output:
- Prototype Enhancements
- Testing
- Certification
- Initial Production

Outcome:
- Production
- Market Analysis
- Business Model
- Entry to the Market

Branding:
STRENGTHENING OF INNOVATION UNIVERSITY IN INDUSTRY

1. Purpose
Develop Industry technology based which has function as a place for learning and innovation product development

2. Focus
ICT; Defence; Food; Health; Energy; Transportation; Advanced material

3. Teaching Industry

4. Selection Criteria
The quality of learning; the quality of business (Industry); readiness and track record of researcher; output, risk and impact

5. Output/Outcome
Learning, Industry and Innovation Product
START –UP COMPANY DEVELOPMENT (PPBT)

INVENTOR

INNOVATOR

INVESTOR

RESEARCHER/ACADEMIA/ENTERPRENEUR

FUNDS PROVIDER

INCUBATOR

START UP (PPBT)
Infrastructure
Start-up Tenant Business Space;
Office Space;
Meeting (business) room;
Internet access;
Telecommunication facility;
Office supplies.

Accompaniment
Business Development
Technology Development and production process;
Business and management Consultation;
Business Plan and Feasibility Study;
Business Legal for start-up company;
Product Standardization;
Product Certification;
Intellectual Property Right Registration;
Accompany and Mentoring;
Product Testing;
Product promotion and Business;
Market Research;
Pelatihan Bisnis.

Networks and Collaboration
Regularly Business Meeting;
Research or Technology Transfer Agency;
Business Partners;
National and international forum.

Capital Access
Capital access facilitation to banking or non-banking institutions;
Financial access to government institutions.
VALUE-CHAIN SMARTPHONE INDUSTRY

CHIPSET & COMPONENTS VENDORS

INDEPENDENT DESIGN HOUSE

MANUFACTURE

BRAND OWNER

DISTRIBUTOR

Cellular Phone Reference Design

SW Design

HW Design

Completely Knocked Down

Semi Knocked Down

Lead Firms
Case Study: Internal and External Synergy
Simple example of Atsiri supply chain

- **Raw Material**
  - Cultivation technology
  - Material

- **Technology**
  - Extraction Technology
  - Distillation Technology
  - Intermediate product (example, crude Atsiri oil)

- **Actor**
  - University (UGM, Brawijaya, Syiah Kuala, etc)
  - community farmers groups

- **Downstream product**
  - Purification Technology
  - Fractionation Technology
  - Manufacture of cosmetics, toiletries and detergents (e.g., Martha Tilaar), Food Industry Pharmaceutical Industry
INNOVATION PRODUCT

Diving Propulsion Vehicle (DPV)  
PT. Robo Marine Indonesia

Weather radar – PT. INTI

Bridge Pads  
PT. Ngagel Citra Rubberindo

Purification Reactor of Patchouli Oil —  
PT. Bahagia Jaya Indo

LRT – PT. INKA

Contactless Smart Card  
PT. Xirka

Salt Pro Analysis  
PT Karya Daya Syafarmasi

ADSB – PT. INTI

Catalyst – PT. Pertamina Cilacap dan Dumai

anti-radar paints

Organic Trash Processing Becomes Biogas  
PT. Rancang Bangun Sejahtera

Stem Cell - UNAIR
Village car west java
PT Tawon Banten

Metrokapsul
PT. TREKKA

Train chair
PT. INKA

Used Lubricant Processor to be fuel oil - PT. BES

lifeboat
PT. Fiberboat Indonesia

panel aircraft N219
PT. Dirgantara Indonesia

Smart Level Crossing
Regional gov of Pekalongan

multipurpose car ITS
PT. Smartech

waste processors POME to be Biogas - PTPN V Riau

Rubber Airbag
PT. Samudera Luas Paramacitra

Train damper
PT. INKA

AC Induction Motor Bow Thruster
PT. RISEA Propulsion Indonesia
Thank you!

Diretorate General for Innovation strengthening
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