Implementation Strategies for Making Indonesia 4.0

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Industrie 4.0 is a response to these changing requirements

Evolution of Production Systems

- 1850: Individualization
- 2000: Globalization
- 1980: Mass Customization
- 1913: Manual Shop Production
- 1955: Mass Production
- 2015: 3D Printed Car
- 2015: iPhone
- 2015: DriveNow

# BENEFITS OF DIGITALIZATION ON PRODUCTION

<table>
<thead>
<tr>
<th>KPIs improvements</th>
<th>Impact range observed</th>
</tr>
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<tbody>
<tr>
<td>Factory output increase</td>
<td>10-200%</td>
</tr>
<tr>
<td>Productivity increase</td>
<td>5-160%</td>
</tr>
<tr>
<td>OEE increase</td>
<td>3-50%</td>
</tr>
<tr>
<td>Quality cost reduction</td>
<td>5-90%</td>
</tr>
<tr>
<td>Product cost reduction</td>
<td>5-40%</td>
</tr>
<tr>
<td>Energy efficiency</td>
<td>2-50%</td>
</tr>
<tr>
<td>Inventory reduction</td>
<td>10-90%</td>
</tr>
<tr>
<td>Lead time reduction</td>
<td>10-90%</td>
</tr>
<tr>
<td>Time to market reduction</td>
<td>30-90%</td>
</tr>
<tr>
<td>Change-over shortening</td>
<td>30-70%</td>
</tr>
<tr>
<td>Lot size reduction</td>
<td>50-90%</td>
</tr>
</tbody>
</table>

**Source:** World Economic Forum and McKinsey & Company lighthouse site analysis
BENEFITS OF DIGITALIZATION ON WORKFORCE

Indonesia’s positive story: many more jobs will be created to 2030 than are lost to automation.

23 million
jobs could be displaced by automation

27 million to 46 million
new jobs could be created in the same period

10 million
of these jobs will be new types of occupations

Healthcare, construction, manufacturing, and retail
will benefit from increased labor demand

McKinsey&Company, 2019
The Impact of Industry 4.0 Optimization on the Distribution of Indonesian Workers

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Accommodation and food service</td>
<td>6.81</td>
<td>7.8</td>
<td>4</td>
</tr>
<tr>
<td>Government</td>
<td>0.65</td>
<td>4.2</td>
<td>0</td>
</tr>
<tr>
<td>Agriculture</td>
<td>9.69</td>
<td>57.0</td>
<td>-4</td>
</tr>
<tr>
<td>Arts</td>
<td>1.21</td>
<td>1.5</td>
<td>1</td>
</tr>
<tr>
<td>Construction</td>
<td>6.01</td>
<td>14.2</td>
<td>2</td>
</tr>
<tr>
<td>Education</td>
<td>2.94</td>
<td>6.3</td>
<td>1</td>
</tr>
<tr>
<td>Finance</td>
<td>0.80</td>
<td>2.0</td>
<td>0</td>
</tr>
<tr>
<td>Healthcare</td>
<td>2.58</td>
<td>4.3</td>
<td>1</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>4.48</td>
<td>24.4</td>
<td>-1</td>
</tr>
<tr>
<td>Professional services</td>
<td>0.09</td>
<td>0.5</td>
<td>0</td>
</tr>
<tr>
<td>Real estate</td>
<td>0.03</td>
<td>0.7</td>
<td>0</td>
</tr>
<tr>
<td>Retail and wholesale trade</td>
<td>3.40</td>
<td>21.1</td>
<td>-2</td>
</tr>
<tr>
<td>Transportation</td>
<td>-0.44</td>
<td>5.2</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>0.76</td>
<td>5.6</td>
<td>1</td>
</tr>
</tbody>
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McKinsey&Company, 2019
INDONESIA HAS OPPORTUNITY TO GET ADDITIONAL GDP OF USD 155 BILLION BY 2025

Through the implementation of Industry 4.0, the additional GDP will be gained from Labour Input and Productivity Enhancement

<table>
<thead>
<tr>
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<th>Additional GDP (USD Billion)</th>
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<tbody>
<tr>
<td>Labour Input</td>
<td>35</td>
</tr>
<tr>
<td>Productivity</td>
<td>120</td>
</tr>
<tr>
<td>Cumulative</td>
<td>155</td>
</tr>
</tbody>
</table>

Source: Global Insight (WMM), IHS data, Euromonitor International, Team analysis

Addition of Digital Workforces:

- Workforce of Manufacturing 4,5 million people
- Workforce of Manufacturing Supporting Industry 12,5 million people

Source: McKinsey,
Policy Direction 2020-2024

#1 Increasing Productivity

Fact 1: Indonesia real labor productivity has stagnated in the past decade. China increased real labor productivity by 2X.

Fact 2: Product design and core manufacturing skills are limited. Assembly/after-sales services dominate skills landscape.

#2 Increasing Manufacturing Export Competitiveness

Fact 1: Manufacturing export share is 73 percent of total export; but Indonesia is significantly outcompeted by peers in manufacturing exports, and >50 percent of export are commodity-related.

Fact 2: Indonesian Export/GDP ratio (19%) is well below Thailand (69%), Vietnam (93%) and Singapore (172%).

#3 Strengthening Strategic Upstream Industries

Fact 1: 71 percent of Indonesia total imports are for raw materials and intermediate input products.

Fact 2: 69 percent of Chemical import are subject to Non-Tariff Measures, further reducing firms cost competitiveness.

6 Key Strategies

#1 Strengthening Investment Climate, Trade Openness and Involvement in Global Production Network

#2 Strengthening RD&D Capabilities, Innovation Drive and Acceleration of Technology Adoption

#3 Increasing Economic Diplomacy and Utilization of Free Trade Agreements

#4 Optimizing Potential Sources of Economic Growth

#5 Strengthening the Supporting Pillars of Manufacturing Sector Growth

#6 Creating Conducive Macroeconomic Policies to Support Manufacturing Development
Industry 4.0 can revive the Indonesian manufacturing sector; Indonesia should launch “Making Indonesia 4.0” initiative.

Impact of Industry 4.0

- Revive Production Sector
- Regain Net Exporter Position
- Improve Country Financial Strength
- Enhance Government Spending
- Build Robust Economy
- Better labor market

Making Indonesia 4.0

Global Top 10 Economy by 2030

- 10% Net Export contribution to GDP (Regain net export position (the same level as 2000))
- 2x current\(^1\) productivity-to-cost (Enhance output while managing cost (Similar improvement speed to India))
- 2% of R&D spending share to GDP (Build local innovation capabilities (Similar level to China\(^2\))
### 5 priority sectors for Industry 4.0 implementation

<table>
<thead>
<tr>
<th>Sector</th>
<th>Mfg. GDP</th>
<th>Mfg. Exports</th>
<th>Mfg. Workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food &amp; Beverage</td>
<td>29%</td>
<td>24%</td>
<td>33%</td>
</tr>
<tr>
<td>Textile &amp; Apparel</td>
<td>7%</td>
<td>15%</td>
<td>20%</td>
</tr>
<tr>
<td>Automotive</td>
<td>9%</td>
<td>7%</td>
<td>2%</td>
</tr>
<tr>
<td>Electronics</td>
<td>6%</td>
<td>9%</td>
<td>2%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>6%</td>
<td>9%</td>
<td>2%</td>
</tr>
</tbody>
</table>

*Source: BPS, A.T. Kearney*
# 10 National Agenda in *Making Indonesia 4.0*

<table>
<thead>
<tr>
<th>Reform Material Flow</th>
<th>Attract Foreign Investments</th>
</tr>
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</table>
| • Enhance **domestic supply** for basic materials while increasing **cost competitiveness** against imports  
  • Build capabilities for **high value component** manufacturing | • Initiate **targeted negotiations** with global top 100 manufactures for FDI while ensuring technology transfer to local talents/companies  
  • Prepare **potential investors list** for all industrial sectors |

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<th>Redesign Industrial Geographical Footprint</th>
<th>Upgrade Human Capital</th>
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</table>
| • Build a **single nationwide comprehensive industry zoning roadmap** across industries including oil & gas  
  • Review and redesign economic zones; build **new economic zones for industry 4.0** | • Review and redesign **national education curriculum under 4IR era**  
  • Establish professional talent development program; e.g. foreign talent mobility program, vocational schools |

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<thead>
<tr>
<th>Accommodate Sustainability Plan</th>
<th>Establish Innovation Ecosystem</th>
</tr>
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<tbody>
<tr>
<td>• Mitigate risks and grab opportunities under global sustainability and <strong>clean tech trends</strong> (e.g. EV, Bio fuel/plastics, renewables, low emission tech, etc.)</td>
<td>• Design <strong>masterplan for national innovation centers</strong> including government innovation/R&amp;D center, private companies, universities, etc.</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Empower SMEs</th>
<th>Incentivize Innovation</th>
</tr>
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<tbody>
<tr>
<td>• Establish a <strong>SME empowerment plan</strong> by leveraging technologies (e.g. ecommerce platform for local farmers and craftsmen, microfinance through fintech, etc.)</td>
<td>• Introduce <strong>tax exemption, subsidies</strong> or other form of incentives for advanced technology adoption (e.g. new machine introduction, R&amp;D spending, employee training, technology transfer, etc.)</td>
</tr>
</tbody>
</table>

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<thead>
<tr>
<th>Build Digital Infrastructure Nationwide</th>
<th>Reoptimize Industry Regulations &amp; Policies</th>
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</table>
| • Upgrade **national broadband infrastructures** i.e. fiber and 4G/5G  
  • Enhance **digital platform capabilities** e.g. datacenter and cloud, security mgmt., e-payment, etc. | • Review key industry policies/regulations and align existing roadmaps from various ministries to **maximize Indonesian national benefit**, e.g. trade policies, labor policies, energy policies, tax policies, etc. |
**INDI 4.0 Self-Assessment Result on 323 Companies**

*INDI 4.0 : Indonesia Industry 4.0 Readiness Index*

<table>
<thead>
<tr>
<th>Industrial Sector</th>
<th>Total</th>
<th>INDI 4.0 Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food &amp; Beverages</td>
<td>39</td>
<td>2.47</td>
</tr>
<tr>
<td>Textiles</td>
<td>10</td>
<td>2.51</td>
</tr>
<tr>
<td>Chemicals</td>
<td>30</td>
<td>2.31</td>
</tr>
<tr>
<td>Automotive</td>
<td>193</td>
<td>1.72</td>
</tr>
<tr>
<td>Electronics</td>
<td>28</td>
<td>1.84</td>
</tr>
<tr>
<td>Metal</td>
<td>11</td>
<td>1.57</td>
</tr>
<tr>
<td>Various</td>
<td>11</td>
<td>1.97</td>
</tr>
<tr>
<td>EPC</td>
<td>1</td>
<td>2.74</td>
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</table>
At the WEF Annual Meeting of the New Champion held in China this year, the WEF established 10 new pilot companies in terms of implementing Industry 4.0 according to their respective fields. Of the 10 companies, 2 (two) companies are from Indonesia, namely:

**PT. Schneider Electric Manufacturing Batam**

**PT. Petrosea, Tbk.**
INDUSTRY 4.0 TRANSFORMATION MENTORING SCHEME

Finalize Implementation Roadmap I4.0 for Industry
1. Business Case Preparation
2. Presentation to Senior Level Management

Pilot Selected Industry
1. Define potential industry per industry sector
2. Senior Level Management Commitment

Deployment of I4.0 Project
1. Pilot Project of Key Technology I4.0
2. Collaboration with I4.0 Ecosystem

Do Assessment
1. External Technical Expertise Assessment
2. Recommendation Action

Train the Trainer I4.0 Transformation Manager
1. Workshop for I4.0 Transformation Manager
2. Workshop for Technical Engineer
3. Certification

Define Assessment Document – INDI 4.0
1. Government Awareness Socialization
2. Work On Specific Industry Sector
3. Validation Value Chain Point

Monitoring & Evaluation
1. Site Visit & Monthly Review
2. Evaluation

INDI 4.0 Assessment
Industry 4.0 (I4.0) Mentoring
COMPANIES ALREADY MENTORED TOWARDS INDUSTRY 4.0 TRANSFORMATION
RESULTS AND RECOMMENDATIONS

General Findings
- Lack of Understanding of Industry 4.0
- Limited Integration of the different systems
- Strategy for Industry 4.0 is not defined; no actionable roadmap

Gaps and Needs
- Strong partners required to guide necessary transformation
- Training for leadership and operation
- Specific solutions and vendors to start implementation

Recommendations for companies
- Roadmap, Business Case Development
- Scalable pilots and implementation
- Individualized training and upskilling

Source: TUV SUD
FUTURE NEEDS ON SKILL AND COMPETENCE

21st Century Skills

- **Foundational Literacies:** Literation, numeration, culture literation
- **Competencies:** Critical thinking, creativity, communications, collaboration
- **Character Qualities:** Curiosity, initiatives, leadership, social sensitivity

Universities

- Preparation of Qualified & Competitive Human Capital
- Improvement of Technology Adoption Capability & Innovation Creation

- **R&D for Science & Technology Creation**
- **Knowledge Development**
- **R&D Collaboration**
- **Effective Innovation**

- **R&D**

- • Increasing of Technology & Science Contribution to the Acceleration of Economic Growth
- • Increasing of National Income supported by Competitive Workforces

Source: BAPPENAS
INDUSTRIAL VOCATION REVITALIZATION PROGRAM
MINISTRY OF INDUSTRY  2020-2024

Establishment Politechnic

Link and Match

3-in-1 Program

Competent Industrial Workforce

Making Indonesia 4.0
DIGITAL & INNOVATION CENTER 4.0 PERMATA HIJAU
- Pusat Inovasi dan Digital 4.0 (PIDI 4.0) -

2. Showcase center
   - E2E showcase auto, F&B industries
   - Select relevant product, process for “model company”
   - Map specific technologies and solutions along the whole value chain
   - Develop roadmap of use cases
   - Derive simpler showcase(s) for DCC satellites
   - Go-and-see (e.g., to lighthouse sites, other DCC abroad and in Indonesia)

3. Capability center:
   - Blueprint of full curriculum program leveraging 60+ thematic modules from DCC network and 100+ modules for front-line
   - Tailor the program to the needs of Indonesia’s industries
   - On board strategic partners for relevant topics (e.g., vocational training)
   - Define go-to market strategy for training

4. Ecosystem for Industry 4.0:
   - Blueprint ecosystem construct with relevant stakeholders and recruit anchor users
   - Leverage global network to recruit leading technology companies and accelerators
   - Assess potential partners using robust parameters / criteria
   - Create governance system e.g. with membership tiering system and benefits

5. Delivery center:
   - Supporting companies along adoption journey:
     - Deploy relevant parties to drive INDI 4.0 assessments and blueprint of delivery model
     - Implement DIY delivery portal, providing guidance for companies to self-launch Industry 4.0
   - Set up two distinct value propositions

6. Innovation center:
   - Research brokering between industry users and academic setting
     - Directing users to relevant research based on the industry need, and ensuring industry-relevance of output
   - Safe test bed for piloting and validating new technologies through the 2 “model company” showcases

7. Strong economic model, organizational structure, partnership and sustainability model
   - Build the business model with:
     - Define strong organization structure and
     - Create roles and responsibility and
     - Prepare 5-year business plan
Partner Country at HANNOVER MESSE 2020 is Indonesia

Representatives from Indonesia set the stage for their country’s role as Partner Country at HANNOVER MESSE 2020 with the unveiling of the official Partner Country logo. From 20 to 24 April 2020, the resource-rich country will be the center of attention at the world’s leading trade fair for industrial technology. Indonesia belongs to the Association of Southeast Asian Nations (ASEAN) and has the biggest economy within the group.

From 20 to 24 April 2020, one of the largest manufacturing economies in Asia takes center stage at the world’s leading tradeshow for industrial technology. Indonesia is by far the largest economy within the Association of Southeast Asian Nations (ASEAN). The archipelagic country aspires to become a global top ten economy by 2030.
THANK YOU

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