Digitalization - Steel Industry

Rizwan Janjua, Head of Technology

28 Sep 2017, OECD Steel Committee
Disclaimer

For presentations to the general public:
This document is protected by copyright. Distribution to third parties or reproduction in any format is not permitted without written permission from worldsteel.
worldsteel operates under the strictest antitrust guidelines. Visit worldsteel.org\About us for detailed antitrust guidelines.
Contents

- Introduction
- Trends & Examples from the Steel Industry
  - Vertical digitalisation
- Horizontal Digitalization
- Implications for Society
Introduction
Traditional Industry vs Next Generation (I3, Industry 4.0)

- The next paradigm shift calls for a new industry classification

(Agricultural Era) (Industrial Era) (Information Era) (Smart Era)
- (Neolithic Age ~ Mid-18th Century) (2H 18th Century ~ Mid-20th Century) (2H 20th Century ~ Present) (Present)

Current industrial classification fails to reflect
- Convergence of industries
- Breakdown of boundaries

Servitization
Product-Service Systems

(Source: POSCO)
Digitalization: Areas of opportunity for the steel industry

**Key Areas of Opportunity**

- **Energy**
- **Resource efficiency**
- **Environment**
- **Safety**
- **Operational & commercial excellence**

**Steelworks**

- Systemic optimization
- Yield, material quality
- CO2, greenhouse gases
- Process & occupational safety
- Order processing, Reliability, inventory

**Supply-chain**

- Micro/mini grid
- 3R - Circular economy
- Value creation, supply-chain management

**Horizontal digitalization**

**Vertical digitalization**
Vertical Digitalisation
(Trends & Examples from the Steel Industry)
Vertical digitalisation - Drivers

**INDUSTRY DRIVERS**

- Min. in-process inventory
- Reliability – Minimum down-time
- Safety – Process & Occupational

**CUSTOMER NEEDS**

- Quality
- Transparency
- Customization
- Circular economy
- **DIFOTIS***
- Flexibility
- Service orientation

**DRIVERS**

- High yield – 100% Quality, zero waste
- Make to order – Dynamic swift response
- Real-time actionable information

* DIFOTIS – Delivery in Full on time in specification
Example Areas

Predictive maintenance & Safety
Higher uptime

Logistics
Dynamic scheduling of process & order-flow

Product Quality
100% testing, inspection

Self-learning systems

Process Control
Real-time analysis & control
Horizontal Digitalization
Supply Chain: Requirements

- **Collaboration**: customers & suppliers sharing data openly
  - Data is value. Slim chance of delivering value and customised products with limited transparency

- **Servitization**
  - Departure from selling product to selling *Product-Service* systems
  - Link with end-user products, cars, buildings, infrastructure

- **Security**
  - Potential risk from competitors and hackers with malicious intent

- **Standardisation**: an invisible road block
  - The total cost of ownership from implementation to managing and upgrading processes can be much higher.
Social implications
(Needs on & Implications for the Society)
Economies

- Digitalization will have profound impacts on society at macro and micro levels:
  - Speed of change: days instead of years
  - Advanced, developing and economies in transition
- Labour cost differentials will play diminishing role
## Challenges

<table>
<thead>
<tr>
<th>Education</th>
<th>Businesses</th>
<th>Policymakers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduates with the right skillset</td>
<td>Reskilling</td>
<td>Structural transformation</td>
</tr>
<tr>
<td>Lifelong learning</td>
<td></td>
<td>Social &amp; organizational challenges</td>
</tr>
</tbody>
</table>
Shift towards high-skilled jobs

The distribution of occupational employment over the probability of computerisation based on US Employment Data

Transformation of Jobs

- Previous industrial revolutions have been mostly positive
- Though manufacturing jobs will decrease, profitability and ROCE rise will create new investment opportunities e.g.
  - Manufacturing of smart drones, robots, digital medicine, precision machines
  - Software development
Workforce & Social Systems

- **Education**
  - STEM subjects are of prime importance
  - Systemic thinking
  - Ability to deal with self-learning systems

- **Revision of social systems**
  - Division of labour (automation & human)

- Legal obligations on liabilities & insurance claims
Concluding remarks

- Enormous opportunities for the industry & society
  - Human needs to be at the heart of the change
- Change towards complex jobs requires multi-disciplinary skills
- Technological advances largely predictable – social impacts are less so
  - Social welfare systems will need review to tackle inequality
- Though there are further opportunities of wealth & higher living standards, it requires:
  - Major efforts to train and educate people
  - Ensure digital inclusion & move from competition to connection and collaboration
- Ignoring the change or wanting to be a follower may not allow your business to be maintained. Join in and participate or you may never catch up.
Thank you for your attention.

For further information contact:

Dr Rizwan A. Janjua | Head, Technology
World Steel Association
janjua@worldsteel.org | T: +32 (0)2 702 89 00 | worldsteel.org