Advanced digital technologies in South African manufacturing: Emerging issues

Elvis K. Avenyo
Senior Researcher
Importance of digital industrialisation to reverse SA’s de-industrialisation and engender structural transformation (CCRED, 2019)

Advanced manufacturing and automation increase productivity; develop and integrate into value chains

South Africa is unprepared to fully adopt and adapt frontier digital technologies for sustainable structural transformation (IDTT 2022; DCDT 2021; CCRED, 2019)

General lack of understanding of digital industrialisation in SA firms
Multi-level framework to analyse digitalisation

Source: Authors
The Digital Skills Survey 2021

- Collaboration between the IDTT and SARChl-ID, supported by the DTIC
- SETAs: manufacturing and engineering services (MerSETA), chemicals (CHIETA), and textiles and fibre processing (FP&M SETA)
- Conducted in March 2021, via emails using standard survey questionnaire: LA cases; UNIDO

Table 2: Breakdown of survey

<table>
<thead>
<tr>
<th>Invitations</th>
<th>7,432</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response Rate</td>
<td>≈7%</td>
</tr>
<tr>
<td>Total Responses</td>
<td>516</td>
</tr>
<tr>
<td></td>
<td>MerSETA (67%); CHIETA (17%); FP&amp;M (16%)</td>
</tr>
</tbody>
</table>

- Use knowledge gleaned from a unique online survey of three manufacturing sector education and training authorities (SETAs) - CHIETA, MerSETA, and FP&M
Firms reliant on manual and semi-automated technologies

PD and PM have higher adoption rates of more advanced technologies
Technology by firm size

- **Medium-sized firms** leading adoption of digital system-enabled technologies
- **Micro- and small-sized firms** dominating in automation and ICT-enabled technologies

Source: Authors

Notes: Small - Sales valued at between R11 and R50 million in the 2019/20 financial year, Medium - Sales valued at between R51 and R250 million 2019/20 financial year, and Large - Sales valued at more than R250 million 2019/20 financial year.
Firms at the industry level reliant on manual and semi-automated technologies

Observed heterogeneity in adoption of digital technologies

Leaders

Laggards
Emerging issues

- Results show a mix of factors that influence the adoption of digital technologies across the three business functions under consideration.

- Cost-related constraints = crucial determining factor of adoption.
  - Supplier and customer relations business functions most affected

- Older, export-orientated, and foreign-owned firms displayed higher degrees of digital technology adoption.
  - Across all business functions.

- Human capital is essential for the adoption of digital technologies across the functions.
  - Emphasising the importance of STEM skills.
Conclusions

- Digital industrialisation fundamental to structural transformation
  - Escape middle-income technology trap
- Inequality between firms in the adoption and use of advanced digital technologies
  - Uneven speed and scale
- Digital divide across several levels of analysis (SETA, industry, and firm size)
- Opportunities for regional (digital) industrial policy.
Thank you!
elvisa@uj.ac.za