



Integrate. Manage. Empower.

Smarter energy for a smarter planet.

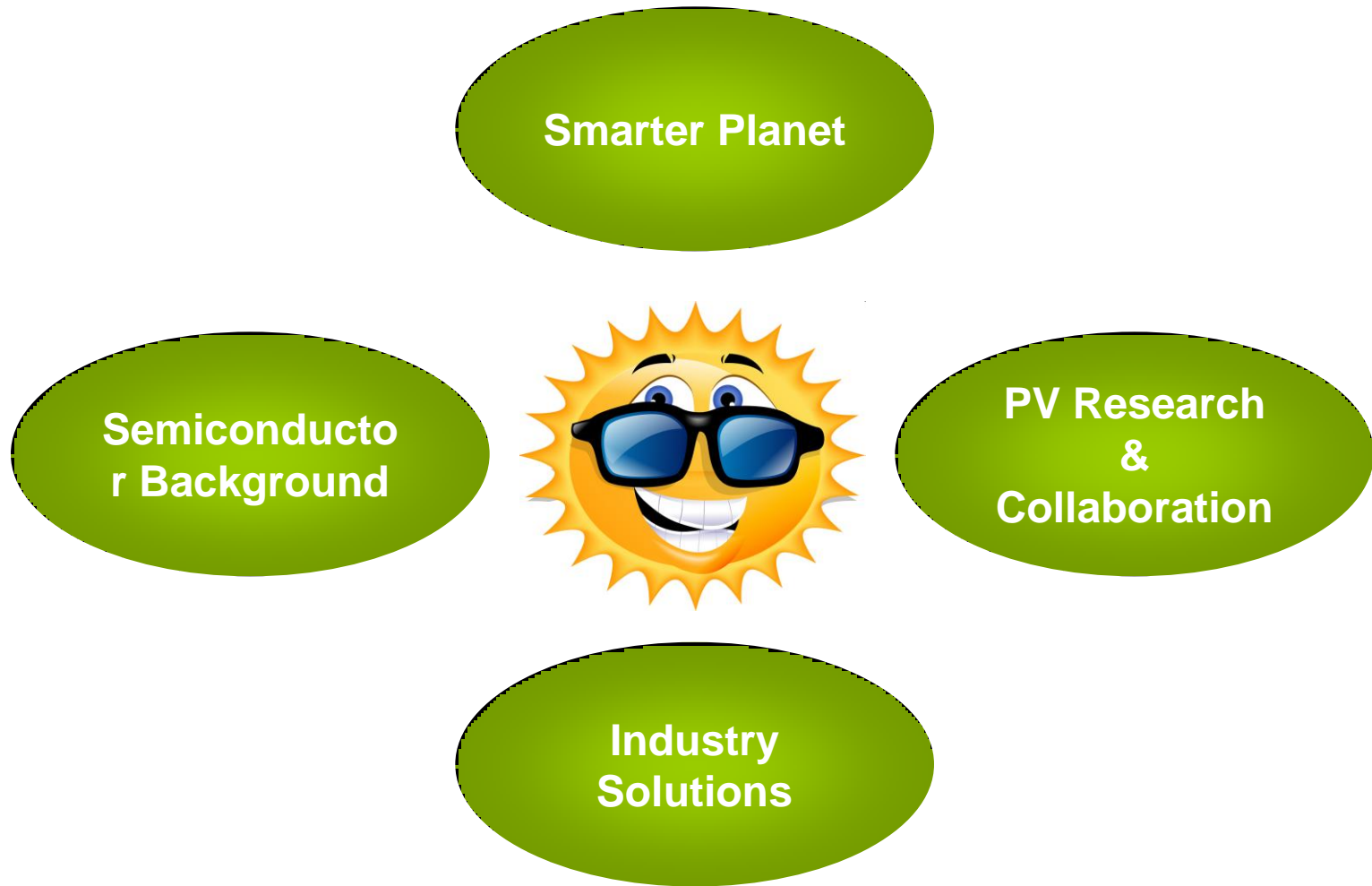


Integrated PV value chain – a smarter approach to success

Christian Seider, Solar Segment Leader, IBM Business Consulting

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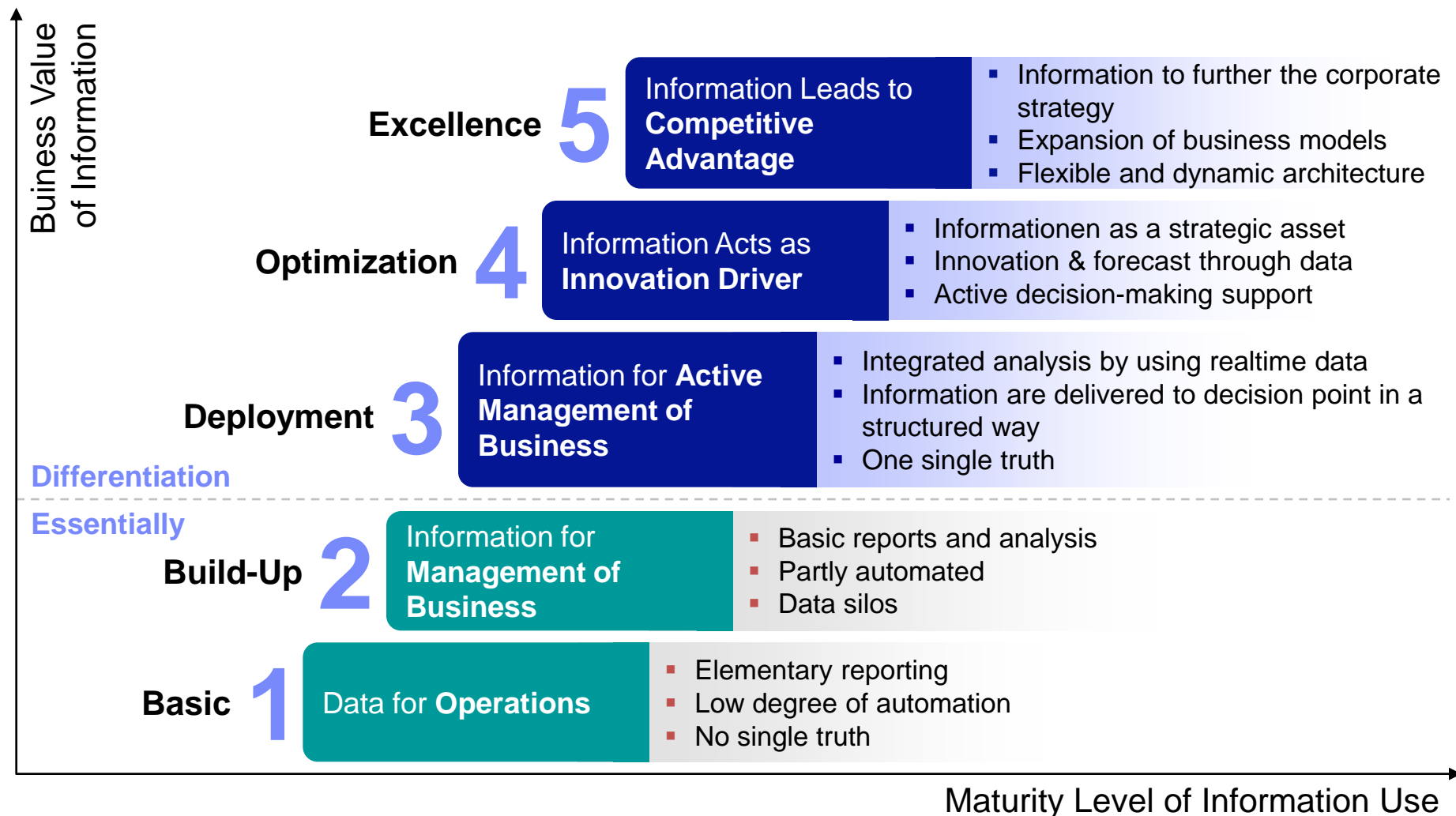
IBM and Photovoltaics





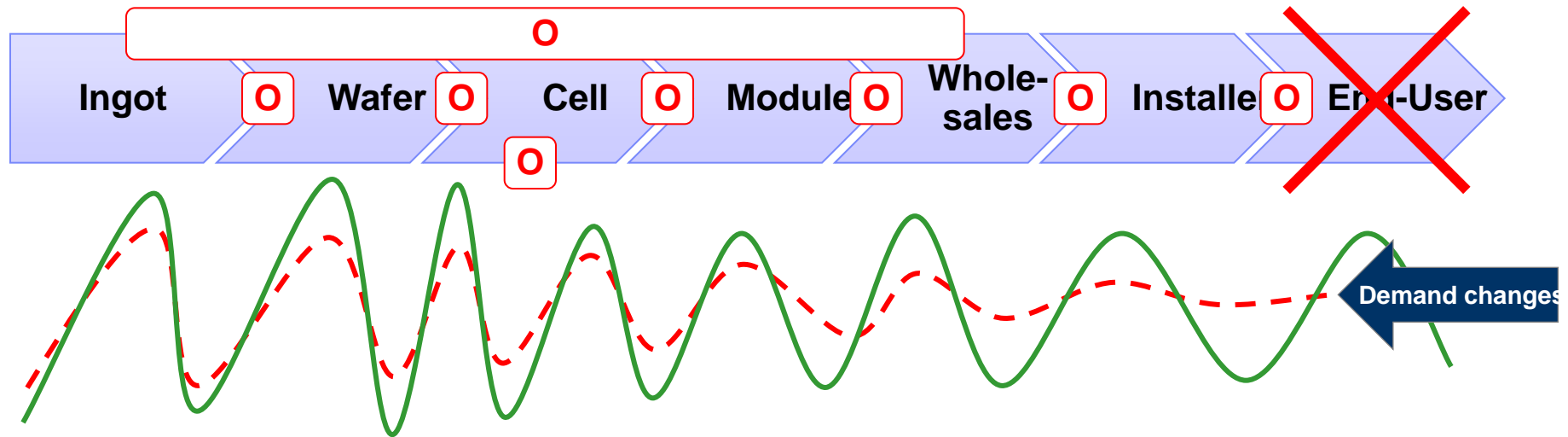
***“It looks like you have all of the data –
what is the holdup?”***

We all have too much data available – the secret is how effectively and efficiently we are using it



The PV value chain is growing in terms of global complexity and volatility **which calls for advanced use of information**

Example: Crystalline Silicon PV value chain



Rapid demand changes caused by:

- Rise of new geographical markets
- Natural catastrophes
- Local politics and incentives
- Oil and gas prices
- Public opinion

 Opportunities

There are significant opportunities in today's PV value chain

1



Low use of electronic commerce

**Exchange of
Electronic Data**

2



Lack of value chain visibility

**Forecasting, Analytics,
Alerting and Event
Management**

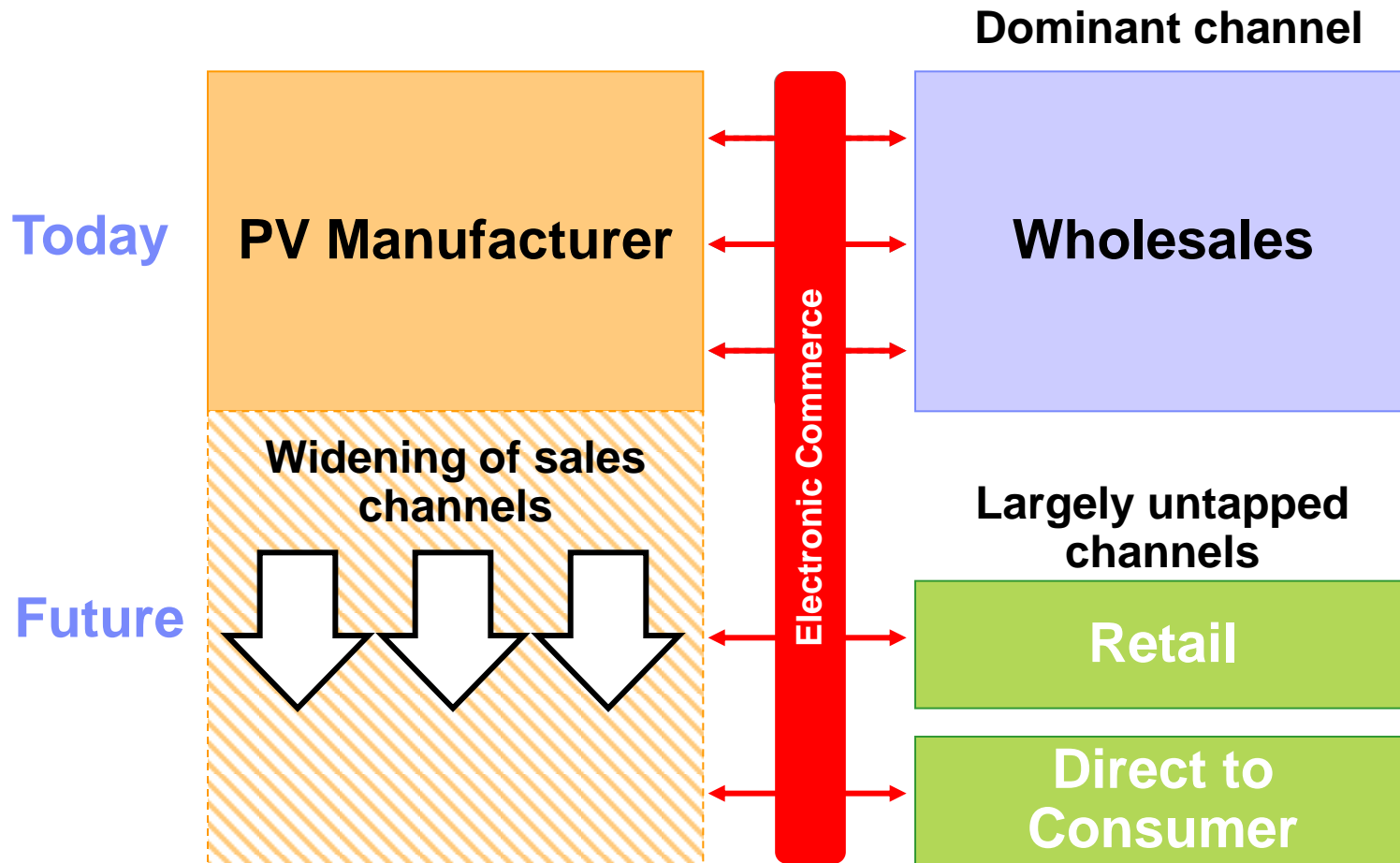
3



**Limited integration of
manufacturing equipment data**

**Advanced
Analytics**

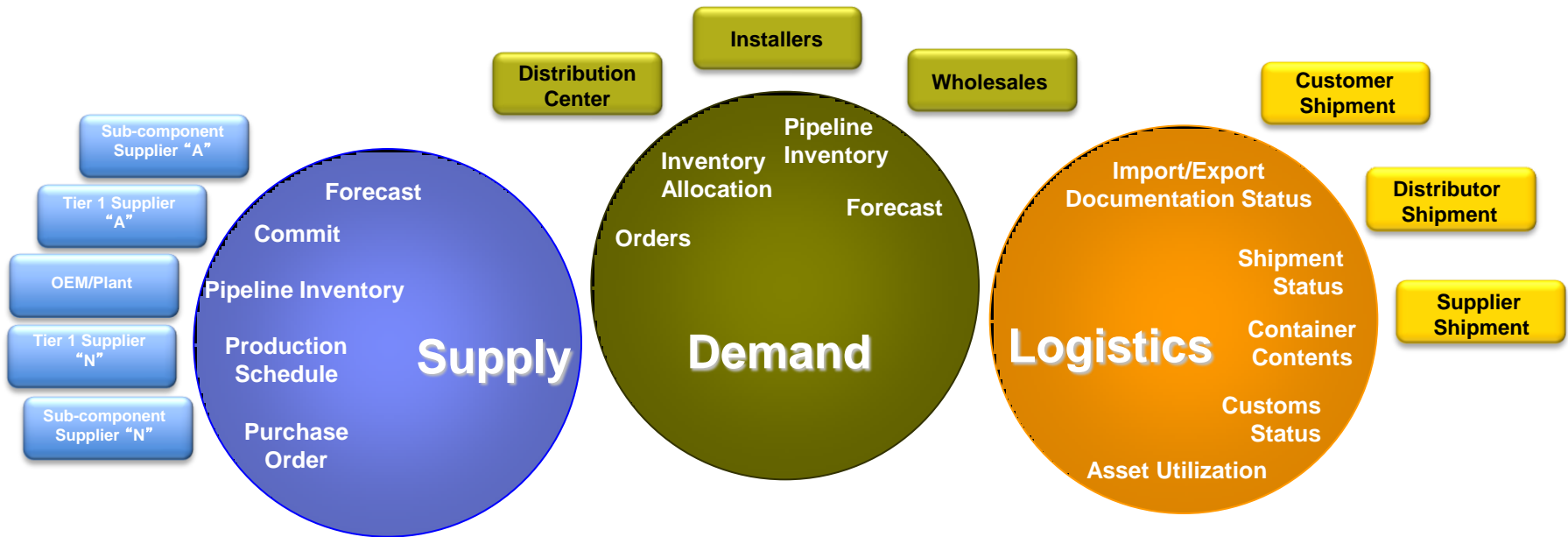
Low use of electronic commerce increases manual efforts and limits insight for PV manufacturers



Lack of value chain visibility drives uncertainty and inventories



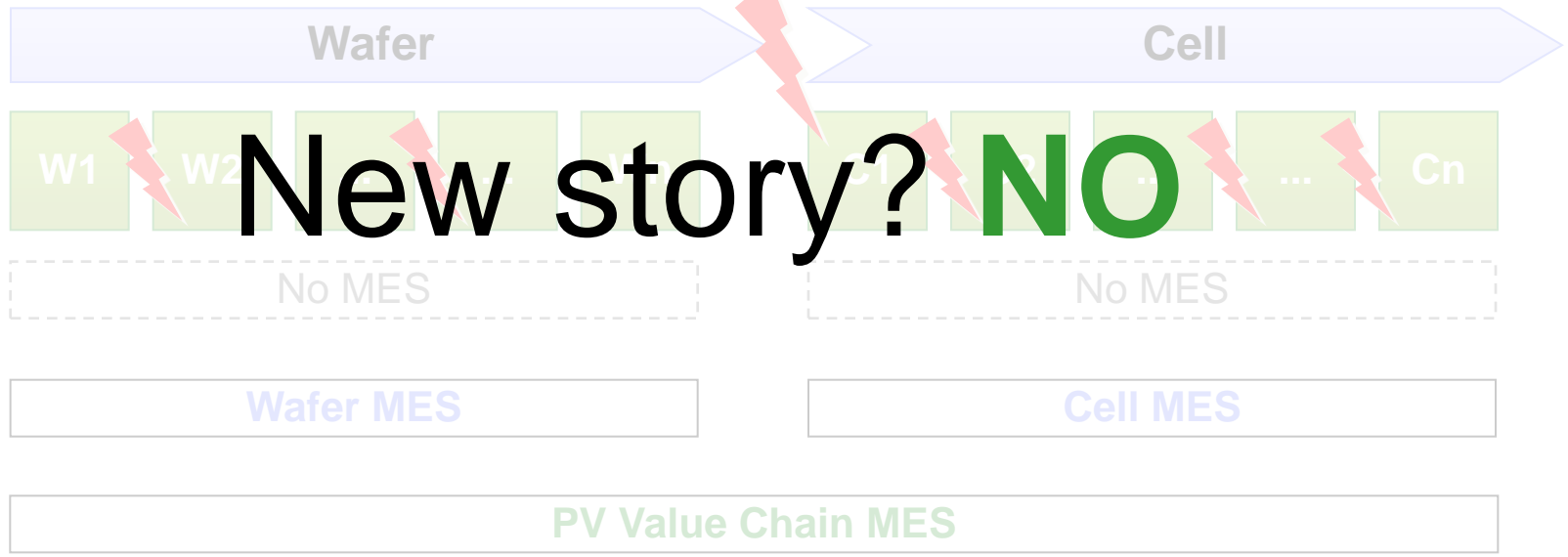
Value Chain Visibility integrates and synchronizes demand, supply and logistics to **optimize performance**



Limited integration of manufacturing equipment data **inhibits** efficiency gains and productivity

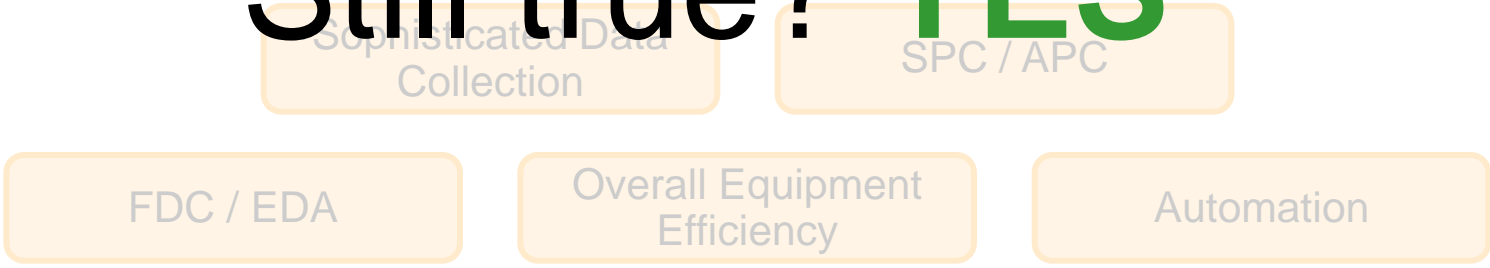


Trend towards larger and integrated fabs



New story? **NO**

Still true? **YES**



So why is it not fully implemented yet?



Improvement Opportunities reside in:

Half-baked PV equipment interface standard

Value chain steps are considered independently

Best-practice analytics are not fully exploited

Benefits are attractive



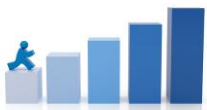
**Low use of
electronic
commerce**

- Reduction in manual data entry efforts
- Reduction of faulty or duplicate data
- Improved process transparency
- Easier aggregation and quicker forecasting of data
- Opening of new sales channels



**Lack of value chain
visibility**

- Better management of demand fluctuations
- Reduction of raw, semi- and finished goods inventories
- Quicker and better decision making



**Limited integration
of manufacturing
equipment data**

- Faster ramp-up of production lines
- Improved root cause analysis
- Improved yields and efficiencies

Main levers to exploit those PV value chain opportunities

1. Apply advanced analytics
2. Collaborate within and across the industry
3. Adopt best-practices from high-tech industry
4. Identify biggest pains and develop a roadmap
5. Be ruthless in the implementation



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Thank You!

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christian.seider@de.ibm.com