

# Digital Engineering – The new growth engine for AEC Market

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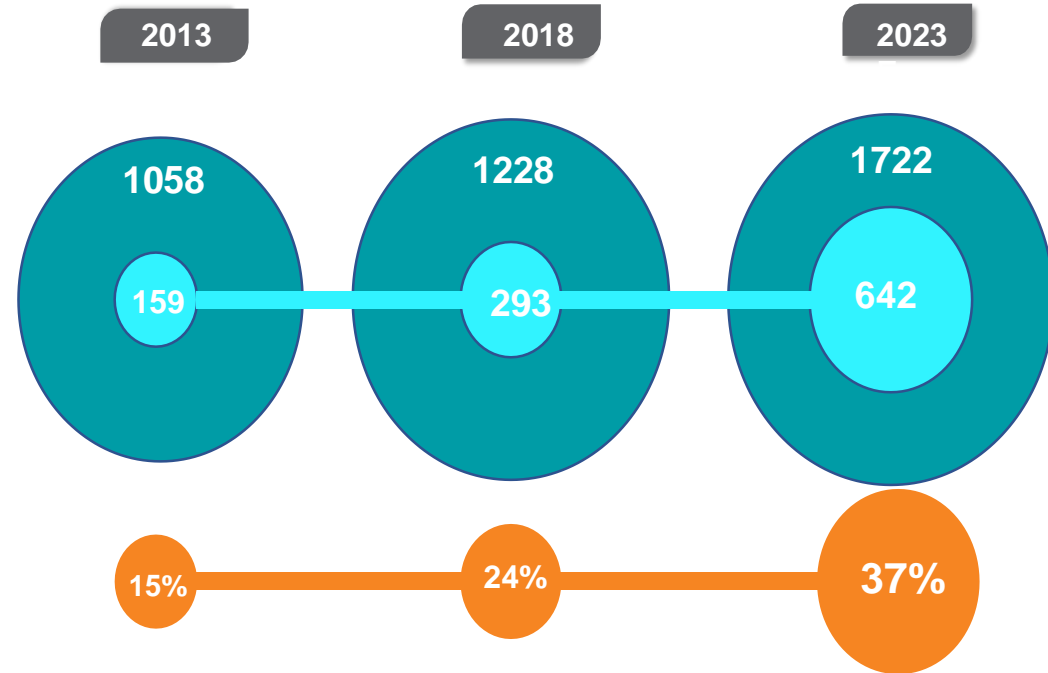
Former Chairman, Nasscom

Chairman, Board of Governors, IIT Hyderabad

# Digital Engineering Transforming Industries



**Digital Engineering Spend to Account for 37% of Total ER&D Spend by 2023**



**Digital engg driven by convergence of:**





- Tech innovations
- Business model innovations
- Growth of tech giants & startups
- vibrant global digital ecosystem



# Digital Engineering “Renewing the Old” & “Building the New”

	Modernize product development process “RENEW THE OLD”	New/Connected Products and Services “BUILD THE NEW”
<b>Automotive</b>	<ul style="list-style-type: none"> <li>• Robotic automation in plants</li> <li>• 3D printing for components</li> <li>• Digital PLM</li> </ul>	<ul style="list-style-type: none"> <li>• Autonomous vehicles</li> <li>• Connected vehicles</li> <li>• ADAS</li> </ul>
<b>Consumer electronics</b>	<ul style="list-style-type: none"> <li>• Digital modernization of product launch/ development process</li> <li>• Digital tools feedback for design</li> </ul>	<ul style="list-style-type: none"> <li>• Connected &amp; smart devices</li> <li>• Platformization</li> </ul>
<b>Industrial</b>	<ul style="list-style-type: none"> <li>• Factory 4.0 and plant automation</li> <li>• Digital Twins</li> <li>• 3D Printing</li> </ul>	<ul style="list-style-type: none"> <li>• Predictive asset maintenance</li> <li>• Connected equipment</li> </ul>
<b>Medical devices Healthcare &amp;</b>	<ul style="list-style-type: none"> <li>• Drug manufacturing and plant automation</li> <li>• Robotic surgery</li> </ul>	<ul style="list-style-type: none"> <li>• Wearables for monitoring</li> <li>• Preventive healthcare</li> </ul>
<b>Software &amp; Internet</b>	<ul style="list-style-type: none"> <li>• Modernization of product portfolio (Cloud engg)</li> <li>• Agile and DevOps engineering</li> </ul>	<ul style="list-style-type: none"> <li>• New products and platform (SaaS, PaaS)</li> <li>• IoT platforms</li> <li>• AI and ML software</li> <li>• DevOps platforms</li> </ul>
<b>AEC</b>	<ul style="list-style-type: none"> <li>• Revamping modeling-3D modeling &amp; printing tools</li> <li>• BIM for project management</li> </ul>	<ul style="list-style-type: none"> <li>• Drones, cloud to report progress, safety in real time</li> <li>• VR - 360° immersive views to monitor construction progress</li> </ul>

## Outcomes

- Enhanced product dev. velocity 
- Enhanced product ownership experience 
- Alternate revenue streams 
- Efficient processes & quality control 

# Combined Cycle Power Plant (CCPP) – Digital Approach



Cyient performed Engineering Design (BED) of a 450MW Combined Cycle

- Using BIM based approach
- Virtual Reality based process design simulation of Lube oil system in the plant
- Linked live MATLAB process simulation into VR model

Item	Specifications
Total Power Output	450 MW @ ISO / 365MW @ Site Condition
Plant Configuration	300MW Gas Turbine   Condensing Steam Turbine   HRSG
Plant Operation Mode	Gas Turbine Unit : Base/Peak load Steam Turbine Unit : Base Load

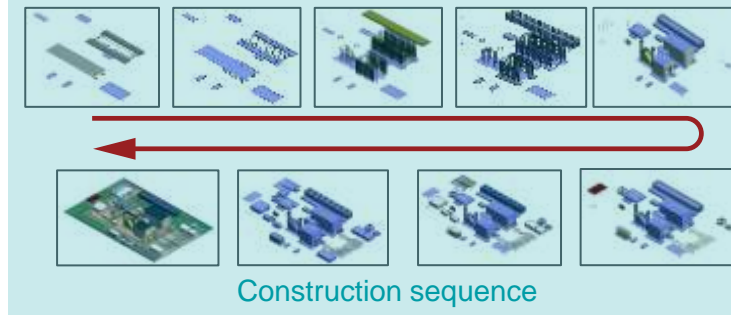
BIM - Dimension	BIM Activities
1D - Conceptual	Site study, Turbine cycles, Key equipment spec, Prelim. plant layout
2D- BED	Heat & Mass balance studies, Plant controls LOD- 200~300 model
4D-Construction Management	Prepare construction sequence, Construction schedule
5D-Cost Management	Project costing, Cost optimization

**BIM Scope : 5D**  
 From Concept to Cost Management  
 Level of Detail (LOD) : 200~300  
 Tool : Revit

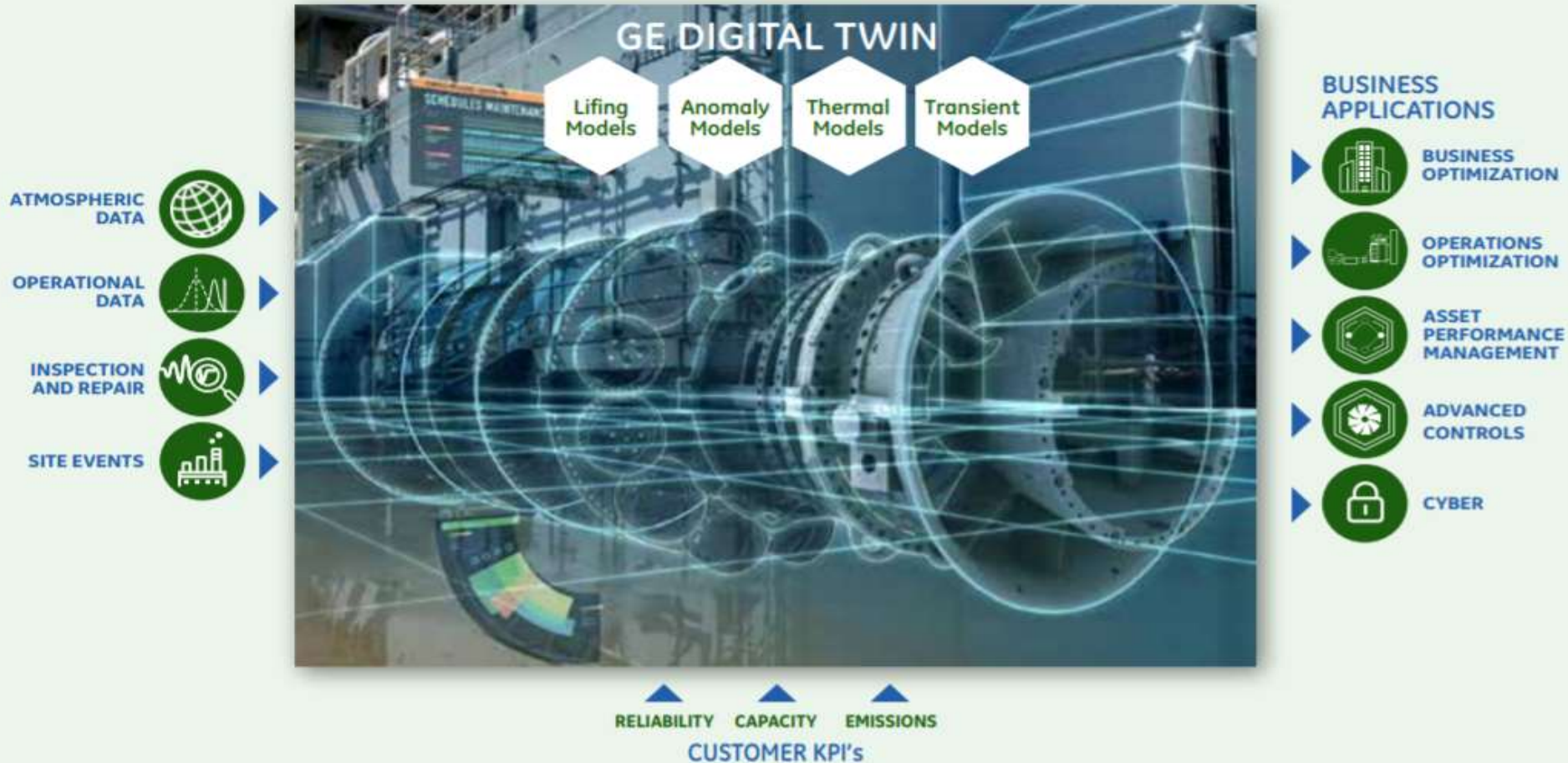


Immersive Experience of Lube Oil system in Power plant (Virtual reality)

- MATLAB process simulation linked to VR Model - Stream live simulation results
- Developed simulation scenarios – Lube oil system start up and shut down
- Plant maintenance training



# Keeping Power Plant up-to-date with Latest Field Data – GE Digital Twin



# 5 Imperatives to Win in Digital Era



## Make 'Where - to-Play' choices & innovate

- Actively prioritize select 'domains/hotspots' to scale – **innovate in-house & shift focus** to hyper growth cells vs 'land-grab'



## Open innovation to build 'full-stack' with partner ecosystem

- Corporate venturing
- E2E 'full-stack' services** across value chain for maximum impact
- Ecosystem of partners** fastest way to scale



## New talent models in digital era

- Re-skill** for digital and re-define **people supply chain**
- Adopt new talent playbook** – from 'hire to retire'



## Programmatic M&A & ability to integrate

- To Access relevant & advanced** technologies, skills and markets
- Culture, business values fit**



## Create value to customer

- Agile organization** taking best of **domain, technical and service line** capability to create value to customers

**Thank you!**