

ICED Evidence Library

Frontier Technology solutions for improved manufacturing

Tags: Energy, Digital, Financial Services, Investment, Infrastructure, Energy, Manufacturing



Using industry research along with professional experiences, ICED designed this toolkit to explore the application, benefits, use cases and foundational dependencies for the eight frontier technologies by sector. Creating a powerful snapshot of these technologies in a contextualized fashion so that DFID programme managers can understand and see the versatility of these frontier technologies. The tool should be used in conjunction with the ICED Digital Benchmarking tool, which contains indicators and qualitative questions exploring country's readiness for digital and frontier technology adoption. For more information on improving the use of digital solutions in programming please consult the ICED website or contact ICED programming.

Frontier Digital Technologies	Internet of Things	Blockchain	Big Data Analytics	Artificial Intelligence	3D Printing	Digital Financial Services	Online Marketplaces	UAVs
	<i>Internet of Things (IoT): Loosely defined as the "infrastructure of the connected society", IoT represents the networking of physical devices, vehicles, buildings, and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data</i>	<i>A digital ledger in which transactions made in bitcoin or another cryptocurrency are recorded chronologically and publicly.</i>	<i>The process of examining large and varied (structured or unstructured) data sets -- i.e., big data -- to uncover hidden patterns, unknown correlations, market trends, customer preferences and other useful information that can help organizations make more-informed business decisions</i>	<i>The theory and development of computer systems able to perform tasks that normally require human intelligence, such as visual perception, speech recognition, decision-making, and translation between languages.</i>	<i>The action or process of making a physical object from a three-dimensional digital model, typically by laying down many thin layers of a material in succession.</i>	<i>Using digital technology to improve access to payments, savings, credit products and other financial services.</i>	<i>Establishing a virtual platform where users can transact goods and services digitally.</i>	<i>An aircraft piloted by remote control or onboard computers.</i>
Application & Benefits	<ul style="list-style-type: none"> Use sensors to track movement of inputs throughout the supply chain to trace speed and productivity Use sensors to track holes in the production line in real time and improve efficiency while reducing downtime 	<ul style="list-style-type: none"> Use blockchain to generate production logs that accurately reflect outputs and cannot be tampered with; to be shared with OEMs and regulators 	<ul style="list-style-type: none"> Track product quality and defects through large data sets of production inventory Improve forecasts and supply planning through real time big data analysis 	<ul style="list-style-type: none"> Through robotics, automate production line to improve efficiency, product quality while reducing leakages 	<ul style="list-style-type: none"> Use 3D printing to prototype new ideas while iterating based on customer feedback When needed, print spare parts needed during the manufacturing process 		<ul style="list-style-type: none"> Use of online market places to improve supply chain and better connect suppliers and buyers 	<ul style="list-style-type: none"> Use of drones for transport, sourcing, safety and asset monitoring
Rest of World Project Examples	Intel Case Studies	IBM Blockchain	Intel Case Studies	Robotics adoption in China Manufacturing	3D Printing Potential article by Dr. Bitange Ndemo N/A		Alibaba	Use of UAVs (across OECD countries) to improve real time inventory and asset monitoring. (using QR codes)

Foundational Considerations

Reliable Broadband Networks								
Affordable Devices and Data								
IT Capacity and Skills								
Digital Literacy and Use								
Digital Payments Infrastructure								
Availability of Capital								
Labour Market								
Ecosystem Policy & Regulation								
Reliable Energy Infrastructure								
Reliable Transportation and Logistics Infrastructure								