KAIHAN'S

MANUFACTURING

INSIGHTS AND PERSPECTIVE

CONTEXT

- The industrial IoT market is estimated to grow from $77.3B in 2020 to $110.6B in 2025 (Forbes) based on a 7.4 percent CAGR (Cision).
- Seventy-three percent of manufacturers plan to increase spending on smart factory implementation in 2021 (RFID Journal).
- Just 12 percent of manufacturing companies have implemented a strategy for IoT technologies in production processes (The MPI Group).
- Manufacturers are moving operations from a business-to-business (B2B) focus to a business-to-consumer model (B2C) in an effort to reduce complexity and increase control (Hitachi Solutions).
- The use of 3D printing for medical devices during the pandemic proved its viability as a flexible option in manufacturing processes (Hitachi Solutions).

TRENDS

1. Digital Twin Technology

- Manufacturers are seeking ways to enhance product design and construction utilizing digital twin technology. Using numerous IoT sensors connected to a tangible product, manufacturers can track and visualize, in real time, the status of an object and create a digital twin of it, allowing them to collect data and diagnose issues from anywhere (IBM). The digital twin assists in data collection for better simulation and visualization of future events and how the tracked asset will perform.

- Twenty-four percent of executives investing in digital technology agree that digital twins are one of the most desirable technologies for investment in 2021 (Deloitte).

- Microsoft, through Azure, offers an enterprise-grade IoT platform for the implementation of digital twins in asset performance monitoring, simulation modeling, and predictive maintenance (Microsoft).

- Barbara Humpton, the CEO of Siemens, envisions a future in which there is a national, digital twin "reserve" to aid manufacturers in maintaining an agile and flexible production strategy (The Hill).

2. Combining B2B and B2C/D2C

- Manufacturing and retail companies alike are beginning to understand the tremendous benefits offered by a business-to-consumer (B2C) operations model.

- With B2C, manufacturers remove intermediaries, allowing for better direct connection to retailers and consumers. Manufacturers can see increased profit, roll-outs, and controls over supply chain, brand image, and consumer data gathering (Hitachi Solutions).

- B2C allows for higher levels of personalization; 56 percent of B2C customers value a personally tailored experience that compounds on past interactions and transactions (Zaius).

- Manufacturing direct-to-consumer (D2C) can complement B2B operations by diversifying a manufacturer's sales, marketing, and operations channels to meet the needs of both individual customers and corporate partners. Manufacturers can translate AI technology from B2B connections into fostering personalized D2C relationships (Salesforce).

3. The Rise of 3D Printing

- 3D printing in various applications will become increasingly more affordable and flexible for manufacturers. 3D printing is being widely utilized for prototyping, tooling, and on-demand manufacturing (Hitachi Solutions).

- 3D printing as an on-demand service for individual customers is seeing growth. Companies across a wide variety of industries are consulting 3D printing manufacturers to fulfill a number of needs—from prosthetic limbs to custom-fitted footwear (Manufacturing Global), to aerospace and aviation parts.

- Velo3D is a metal additive manufacturing company whose printers have enabled companies like SpaceX and Honeywell Aerospace to print outer space- and aerospace-grade parts for aircraft (Fast Company).

- HP is continuously innovating upon their Metal Jet technology, which combines HP's printer prowess with metal additive manufacturing to create a metal-printing 3D printer that is 50 times more productive than competitor offerings (Manufacturing Global).

Leverage Point	"8Ps" of Strategy	Opportunity for Disruption	Recommended Leverage Points
Position	The core customer you serve, what need you meet with what brand attributes	4	• How are you planning to target a new segment of potential customers? • How do you measure your brand's success in delivering your CVP?
Product	The products and services you deliver, where you outperform and where you underperform	6	• What systems do you have in place to ensure product quality and accuracy are increasing? • How can you utilize digital twin technology to innovate your product line?
Promotion	How you communicate with customers (including your marketing, sales, and PR teams)	8	• How can you improve (and even automate) CRM with B2B and B2C customers to improve personalization? • What digital platforms can you use to reach current customers? • How can you utilize creative digital marketing to reach a broader base and add value to your brand image?
Price	How much you charge for services, how you monetize	5	• How can you offer better price transparency to customers? • How are you structuring your pricing model to separate B2B and B2C transactions?

Leverage Point	"8Ps" of Strategy	Opportunity for Disruption	Recommended Leverage Points
Placement	How you deliver on your value proposition, through what channels	7	• How can you deliver more personalized experiences to B2C customers? • Where do you first interact with potential customers? What other connection channels can you explore? • How would B2B and B2C customers rate the accessibility of your product?
Physical Experience	The customer experience, what they see, smell, feel, taste, or hear	5	• How can you create satisfying personalized experiences for B2C customers ordering on a small scale? • How do you measure customer satisfaction?
Processes	Your operations and processes	9	• What steps are necessary to roll-out a B2B/B2C operations model? • How can you implement 3D printing into your production process? • How can your product development benefit from digital twin technology?
People	The choices you make regarding hiring, organizing, and incentivizing your people. Your values.	4	• How do you incentivize productivity? • How is your organization preparing for a smaller work force brought on by automation?

- Instrumental designs AI-powered cameras for production lines to help manufacturers detect defects and pinpoint their location on the line (Fast Company).
- The company released its Discover AI in 2020, which is a machine learning program that can help companies reduce waste and cut production costs by detecting and diagnosing issues within just 30 analyzed units.
- Using Discover AI, production engineers and designers can analyze data from the production lines remotely, reducing issue resolution times.

- In 2020, Arris Composites introduced additive molding, a process which combines additive manufacturing, or 3D printing, with molding to make parts that are stronger, lighter, and cheaper than metal.
- The process of additive molding reduces production costs on conventionally labor-intensive carbon fiber products, and can lead to a higher production volume of carbon fiber and other products (Fast Company).