



Module 14: Digital Transformation and Innovation for Enabling Reconfigurable Production Systems

Timoleon Farmakis, PhD
Stavros Lounis, PhD
Athens University of Economics and Business




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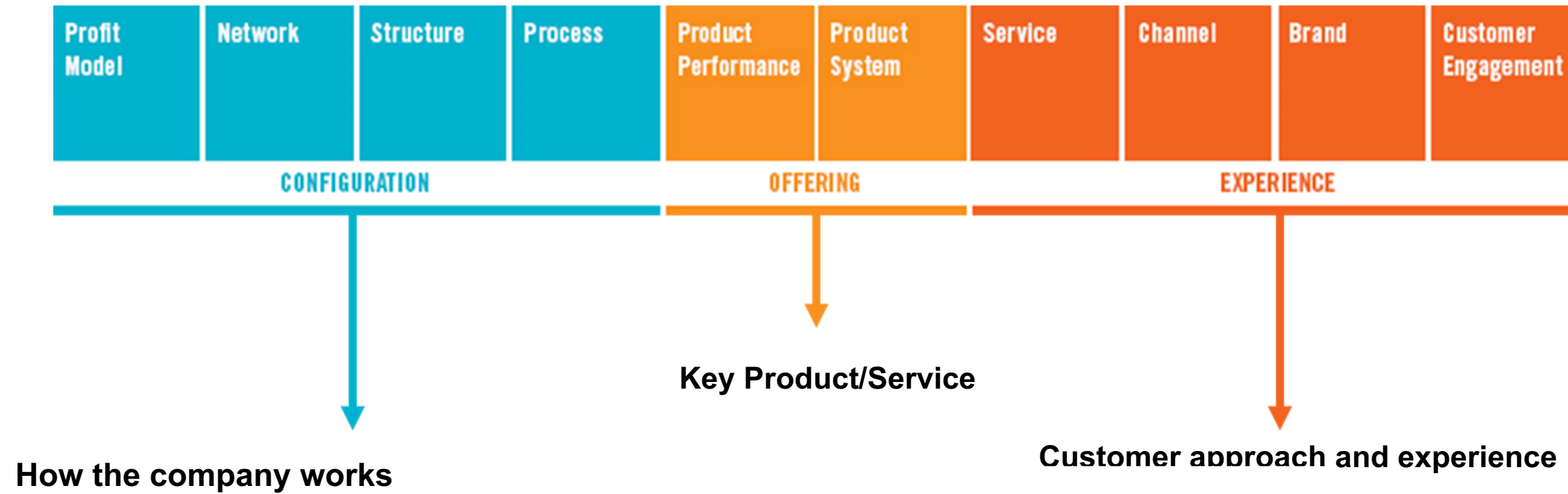


14.3. Innovations in Manufacturing BMs



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10 Types of innovation



Ten types of innovation

Configuration	Profit Model	Make money
	Network	Connect with others to create value
	Structure	Align your talent & assets
	Process	Superior methods
Offering	Product Performance	Features & functionality
	Product System	Create complimentary products / services
Experience	Service	Support & enhance value of offering
	Channel	Deliver your offerings to customers
	Brand	Represent your business & offerings
	Customer engagement	Foster distinctive interactions

Source: Doblin



Examples – 10 Types of Innovation

1. Profit Model

Michelin – Introduced a **tire-as-a-service** model where customers pay per kilometer instead of purchasing tires outright, ensuring cost efficiency and predictive maintenance.

2. Network

Airbus – Developed the **Skywise** open-data platform, allowing suppliers and airlines to share operational insights and optimize aircraft performance collaboratively.

3. Structure

Siemens – Created the **Digital Enterprise Suite**, integrating smart manufacturing solutions across its ecosystem, helping businesses optimize production digitally.

4. Process

Tesla – Pioneered the **gigafactory** concept, using highly automated production lines and AI-driven quality control to scale electric vehicle manufacturing efficiently.

5. Product Performance

General Electric (GE) – Integrated **predictive maintenance and AI-powered diagnostics** into industrial turbines, reducing downtime and optimizing energy efficiency.



Examples – 10 Types of Innovation

6. Product System

Bosch – Developed a **connected factory ecosystem** where IoT-enabled tools communicate in real time to adjust processes and improve production efficiency.

7. Service

ABB Robotics – Offers **remote robot monitoring and predictive maintenance services**, allowing manufacturers to prevent breakdowns before they occur.

8. Channel

Caterpillar – Launched a **digital parts distribution platform**, enabling customers to order spare parts via an app and receive real-time delivery updates.

9. Brand

Schneider Electric – Strengthened its **brand identity in Industry 4.0** by promoting sustainability-focused smart manufacturing solutions.

10. Customer Engagement

Haier – Uses a **co-creation model**, allowing customers and businesses to customize smart home appliances and industrial solutions through digital platforms.

10 Types of Innovation of MODAPTO

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TEN TYPES OF INNOVATION

TACTICS OVERVIEW

Profit Model

Premium
Price at a higher margin than competitors, usually for a superior product, offering, experience, service or brand.

Cost Leadership
Keep variable costs low and sell high volumes at low prices.

Scaled Transactions
Maximize margins by pursuing high volume, large scale transactions when unit costs are relatively fixed.

Microtransactions
Sell many items for as little as a dollar—or even only one cent—to drive impulse purchases at volume.

Forced Scarcity
Limit the supply of offerings available, by quantity, time frame or access, to drive up demand and/or prices.

Subscription
Create predictable cash flows by charging customers up front (a one time or recurring fee) to have access to the product/service over time.

Membership
Charge a time-based payment to permit access to locations, offerings, or services that non-members don't have.

Installed Base
Offer a "core" product for slim margins (or even a loss) to drive demand and loyalty; then realize profit on additional products and services.

Switchboard
Connect multiple sellers with multiple buyers; the more buyers and sellers who join, the more valuable the switchboard.

Auction
Allow a market—and its users—to set the price for goods and services.

User-Defined
Invite customers to set a price they wish to pay.

Freemium
Offer basic services for free, while charging a premium for advanced or special features.

Flexible Pricing
Vary prices for an offering based on demand.

Float
Receive payment prior to building the offering—and use the cash to earn interest prior to making margins.

Financing
Capture revenue not directly from the sale of a product, but from structured payment plans and after-sale interest.

Ad-Supported
Provide content/services for free to one party while selling listeners, viewers or "eyeballs" to another party.

Licensing
Grant permission to some other group or individual to use your offering in a defined way for a specified payment.

Metered Use
Allow customers to pay for only what they use.

Bundled Pricing
Sell in a single transaction two or more items that could be sold as standalone offerings.

Disaggregate Pricing
Allow customers to buy exactly—and only—what they want.

Risk Sharing
Waive standard fees/costs if certain metrics aren't achieved, but receive outside gains when they are.

Network

Merger/Acquisition
Combine two or more entities to gain access to capabilities and assets.

Consolidation
Acquire multiple companies in the same market or complementary markets.

Open Innovation
Obtain access to processes or patents from other companies to leverage, extend, and build on expertise and/or do the same with internal IP and processes.

Secondary Markets
Connect waste streams, by-products, or other alternative offerings to those who want them.

Supply Chain Integration
Coordinate and integrate information and/or processes across a company or functions of the supply chain.

Complementary Partnering
Leverage assets by sharing them with companies that serve similar markets but offer different products and services.

Alliances
Share risks and revenues to jointly improve individual competitive advantage.

Franchising
License business principles, processes, and brand to paying partners.

Coopetition
Join forces with someone who would normally be your competitor to achieve a common goal.

Collaboration
Partner with others for mutual benefit.

Structure

Organizational Design
Make form follow function and align infrastructure with core qualities and business processes.

Incentive Systems
Offer rewards (financial or non-financial) to provide motivation for a particular course of action.

IT Integration
Integrate technology resources and applications.

Competency Center
Cluster resources, practices and expertise into support centers that increase efficiency and effectiveness across the broader organization.

Outsourcing
Assign responsibility for developing or maintaining a system to a vendor.

Corporate University
Provide job-specific or company-specific training for managers.

Decentralized Management
Distribute decision-making governance closer to the customer or other key business interfaces.

Knowledge Management
Share relevant information internally to reduce redundancy and improve job performance.

Asset Standardization
Reduce operating costs and increase connectivity and modularity by standardizing your assets.

Process

Process Standardization
Use common products, processes, procedures, and policies to reduce complexity, costs, and errors.

Localization
Adapt an offering, process, or experience to target a culture or region.

Process Efficiency
Create or produce more while using fewer resources—measured in materials, energy consumption or time.

Flexible Manufacturing
Use a production system that can rapidly react to changes and still operate efficiently.

Process Automation
Apply tools and infrastructure to manage routine activities in order to free up employees.

Crowdsourcing
Outsource repetitive or challenging work to a large group of semi-organized individuals.

On-Demand Production
Produce items after an order has been received to avoid carrying costs of inventory.

Lean Production
Reduce waste and cost in your manufacturing process and other operations.

Logistics Systems
Manage the flow of goods, information and other resources between the point of origin and the point of use.

Strategic Design
Employ a purposeful approach that manifests itself consistently across offerings, brands, and experiences.

Intellectual Property
Protect an idea that has commercial value—such as a recipe or industrial process—with legal tools like patents.

User Generated
Put your users to work in creating and curating content that powers your offerings.

Predictive Analytics
Model past performance data and predict future outcomes to design and price offerings accordingly.

Product Performance

Superior Product
Develop an offering of exceptional design, quality, and/or experience.

Ease of Use
Make your product simple, intuitive and comfortable to use.

Engaging Functionality
Provide an unexpected or newsworthy experiential component that elevates the customer interaction.

Safety
Increase the customer's level of confidence and security.

Feature Aggregation
Combine existing features found across offerings into a single offering.

Added Functionality
Add new functionality to an existing offering.

Performance Simplification
Omit superfluous details, features, and interactions to reduce complexity.

Environmental Sensitivity
Provide offerings that do no harm—or relatively less harm—to the environment.

Conservation
Design your product so that customers can reduce their use of energy or materials.

Customization
Enable altering of the product or service to suit individual requirements or specifications.

Focus
Design an offering specifically for a particular audience at the expense of others.

Styling
Impart a style, fashion or image.

Product System

Complements
Sell additional related or ancillary products or services to a customer.

Extensions/Plug-ins
Allow first- or third-party additions that add functionality.

Product Bundling
Offer several products for sale as one combined product.

Modular Systems
Provide a set of individual components that can be used independently, but gain utility when combined.

Product/Service Platforms
Develop systems that connect with other, partner products and services to create a holistic offering.

Integrated Offering
Combine otherwise discrete components into a complete experience.

Service

Try Before You Buy
Let customers test and experience an offering before investing in it.

Guarantee
Remove customer risk of lost money or time stemming from product failure or purchase error.

Loyalty Programs
Provide benefits and/or discounts to frequent and high-value customers.

Added Value
Include an additional service/function as part of the base price.

Concierge
Provide premium service by taking on tasks for which customers don't have time.

Total Experience Management
Provide thoughtful, holistic management of the consumer experience across an offering's lifecycle.

Supplementary Service
Offer ancillary services that fit with your offering.

Superior Service
Provide service(s) of higher quality, efficacy, or with a better experience than any competitor.

Personalized Service
Use the customer's own information to provide perfectly calibrated service.

User Communities/Support Systems
Provide a communal resource for product/service support, use and extension.

Lease or Loan
Let customers pay over time to lower upfront costs.

Self-Service
Provide users with control over activities that would otherwise require an intermediary to complete.

Channel

Diversification
Add and expand into new or different channels.

Flagship Store
Create a store to showcase quintessential brand and product attributes.

Go Direct
Skip traditional retail channels and connect directly with customers.

Non-Traditional Channels
Employ novel and relevant avenues to reach customers.

Pop-up Presence
Create a noteworthy but temporary environment to showcase and/or sell offerings.

Indirect Distribution
Use others as resellers who take ownership over delivering the offering to the final user.

Multi-Level Marketing
Sell bulk or packaged goods to an affiliated but independent sales force that turns around and sells it for you.

Cross-selling
Place products, services, or information that will enhance an experience in situations where customers are likely to want to access them.

On-Demand
Deliver goods in real-time whenever or wherever they are desired.

Context Specific
Offer timely access to goods that are appropriate for a specific location, occasion, or situation.

Experience Center
Create a space that encourages your customers to interact with your offerings—but purchase them through a different (and often lower-cost) channel.

Brand

Co-Branding
Combine brands to mutually reinforce key attributes or enhance the credibility of an offering.

Brand Leverage
"Lend" your credibility and allow others to use your name—thus extending your brand's reach.

Private Label
Provide goods made by others under your company's brand.

Brand Extension
Offer a new product or service under the umbrella of an existing brand.

Component Branding
Brand an integral component to make a final offering appear more valuable.

Transparency
Let customers see into your operations and participate with your brand and offerings.

Values Alignment
Make your brand stand for a big idea or a set of values and express them consistently in all aspects of your company.

Certification
Develop a brand or mark that signifies and ensures certain characteristics in third-party offerings.

Customer Engagement

Process Automation
Remove the burden of repetitive tasks from the user to simplify life and make new experiences seem magical.

Experience Simplification
Reduce complexity and focus on delivering specific experiences exceptionally well.

Curation
Use a distinct point of view to separate the proverbial wheat from the chaff—and in the process create a strong identity for yourself and your followers.

Experience Enabling
Extend the realm of what's possible to offer a previously improbable experience.

Mastery
Help customers to obtain great skill or deep knowledge of some activity or subject.

Autonomy and Authority
Grant users the power to use your offerings to shape their own experience.

Community and Belonging
Facilitate visceral connections to make people feel they are part of a group or movement.

Personalization
Alter a standard offering to allow the projection of the customer's identity.

Whimsy and Personality
Humanize your offering with small flourishes of on-brand, on-message ways of seeming alive.

Status and Recognition
Offer cues that infer meaning, allowing users—and those who interact with them—to develop and nurture aspects of their identity.

Table 2

The effect of Industry 4.0 on the business model elements of manufacturing SMEs.

Value creation	Value offer	Value capture
<p>Production equipment (26)</p> <ul style="list-style-type: none"> - Productivity increases - Energy savings - Load balancing - Higher fault resistance of production equipment - Fast access to manufacturing data - Machine-health monitoring - Self-controlled production - Increased in-house production - Lower stocks - Easier production maintenance - Retrofitting of older machinery and new equipment required <p>Workforce (22)</p> <ul style="list-style-type: none"> - Attenuation of job shortages in manufacturing, yet likely shortages in Industry 4.0-qualified personnel - Better integration of lower qualified and elderly personnel - New job profiles - New workplaces - Higher technical expertise and employee trainings required - Technology-based trainings - Support in failure recognition - Decreasing number of manufacturing jobs <p>Partners and suppliers (16)</p> <ul style="list-style-type: none"> - Higher inter-company connectivity - Co-design of the value offers - Joint data analysis - Higher information transparency - Higher delivery reliability - Innovative partnerships - Increased virtual contact - Higher standardization required 	<p>Products (20)</p> <ul style="list-style-type: none"> - Larger product spectrum - Less maintenance required - Versatile, flexible products (particularly machines) - Higher quality and output of the produced machines - Incorporation of manufacturing data in products and in production management systems - Products tailored to customer demands - Human-machine-interfaces <p>Services (15)</p> <ul style="list-style-type: none"> - Machine retrofitting services - Condition monitoring - Remote maintenance - Digitization services for customers - Data analytics services - Manufacturing and product simulations - Virtual product development - Engineering and product configuration services 	<p>Customer groups (11)</p> <ul style="list-style-type: none"> - New customer groups addressed within the B2B customer base - Both the risks and the opportunities for customer retention are intensified <p>Customer interaction (23)</p> <ul style="list-style-type: none"> - Customer contact via digital platforms - Eased interaction through digital communication - Co-design and co-engineering - Higher cost transparency - Joint decision-making - Value chain integration of customers - Suppliers become more transparent to customers - Decreases in customer loyalty due to higher anonymity <p>Payment methods (12)</p> <ul style="list-style-type: none"> - Digital accounting and automated invoices - Increased payment reliability - Streamlined payment documentation - Increase in subscription models, pay-per-use and pay-per-feature

(Müller, Buliga and Voigt, 2018)

Innovations in Manufacturing Business Models Enabled by Digital and AI-driven Transformation

