

Social Innovation in Industry 4.0
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Lecture
Digital Innovation (Part 2 of 2)

Welcome to the next lecture on Digital Innovation.

Types of Digital Innovation

Digital innovation can be categorized into two main types: incremental innovation and radical innovation.

1) Incremental Innovation-
Small improvements or enhancements to existing products, services, or processes.

Example 1: Smartphone Evolution
incremental improvement in terms of software, camera, power consumption and better interface.

Example 2: Software Updates
(bugs are fixed, enhance user experience of main down for firmability)

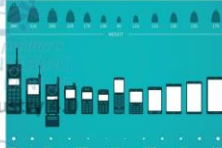


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What are the different types of innovation? There are two types of innovation, one is Incremental innovation and the other one is Radical innovation. Incremental innovation is nothing, but small improvements or enhancements to existing product, service or processes incremental innovation. Example, software or smart phone evolution. So, in smart phone evolution, we will always see incremental improvement in terms of software, camera, power consumption and better interface. So, these are some of the evolution which happens in smart phone.

When we talk about the software updates, the bugs are fixed and then, we also try to enhance user experience and maintain functionality. So, the these two are some examples under digital under incremental innovation.

Types of Digital Innovation

2) Radical Innovation

Significant breakthroughs or disruptive changes that introduce entirely new products, services, or business models.

Example 1: Electric Vehicles - fossil fuel engines/vehicles.

Example 2: Cloud Computing - (the way businesses store, process +

Both types play a significant role in driving progress and advancement in technology across industries.

When we talk about Radical innovation, it is significant breakthrough or disruptive change that introduce entirely new product service or business models. For example, electric vehicles are completely different from your fossil fuel engines or vehicles.

Fossil fuel is a completely different domain and electric vehicles are different domain. In fossil fuel, the number of parts can be 1000 and in electric vehicles, the number of parts can be reduced to 100. The number of moving parts will be less than 50. So, now, if there are now the moving parts are less the friction is less the efficiency is high. So, a disruptive technology, earlier we used to use a grass cutter, which is which is powered by an IC engine, today it is replaced by a battery.

So, electric vehicles, right. The next one is Cloud Computing. It tries to transform the ways businesses in store process and assess data providing scalability and flexibility in computing resources. So, both types play a significant role in driving progress and advancement in technology across industry. So, digital technology, two innovations, Incremental and Radical.

Types of Digital Innovation

In addition to incremental and radical innovation, digital innovation can be further classified into two types:

- Product innovation
- Process innovation

1) Product innovation:

Product innovation involves developing new or improved products or services to meet customer needs or create entirely novel offerings.

Characteristics:

- Customer Value : creating offering that meet customer needs & preferences
- Novelty :- new design
- Market Differentiation : creating a competitive advantage with unique & innovative products.

In addition to the Incremental and radical innovation, digital innovation can be further classified into Product innovation and Process innovation. What is Product innovation? The Product innovation involves developing new or improved products or service to meet customer needs or create entirely novel offering, that is product innovation. So, here we try to have characteristics like customer value, it creating offering that, meet customer needs and preferences, that is the customer value.

Technology is introducing new design that differentiates from the older one and then the market differentiator is gaining a competitive advantage with unique and innovative products. So, market differentiator is going to be gaining a competitive advantage with unique and innovative products. So, these are all Product innovation.

Types of Digital Innovation

Example: Apple's iPhone

- Apple's iPhone is a prime example of product innovation, revolutionizing the mobile phone industry.
- With each new generation, Apple introduces innovative features, such as
 - Face ID
 - Advanced cameras
 - Augmented reality capabilities
 - Enhanced user interfacessetting new standards for smartphones.

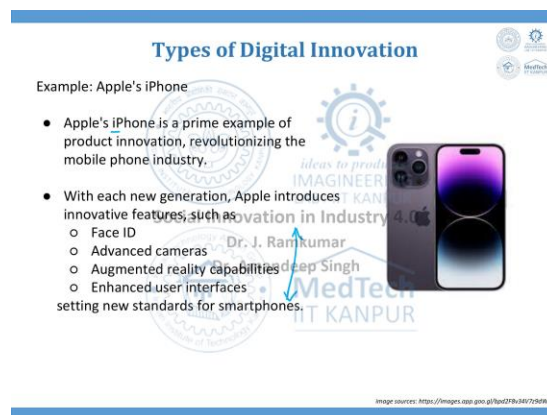


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So, let us see Product innovation example. Apple iPhone is a prime example for Product innovation revolutionizing the mobile phone industry. With each new generation, Apple introduces innovation features like face ID, advanced camera, augmented reality capability, enhanced user interface. So, all these things are product innovation it is incremental, but it happens slowly slowly on a product

So, Apple is one example. In the same way, there can be for a software also, there can be for any product. For example, first the product was made out of steel, now, it is made out of plastic or it was made out of plastic, now, it is made out of steel, you can change. Initially it was made out of stainless steel, now, it is made out of titanium then, later it will be made out of magnesium, completely changed. So, types of product innovation, Apple is an example we saw.

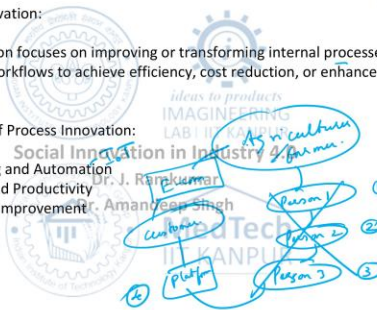
Types of Digital Innovation

2) Process Innovation:

Process innovation focuses on improving or transforming internal processes, operations, or workflows to achieve efficiency, cost reduction, or enhanced performance.

Characteristics of Process Innovation:

- Streamlining and Automation
- Efficiency and Productivity
- Continuous Improvement



The next one is Process innovation. Process innovation focuses on improving or transforming internal processes operation or workflow to achieve efficiency, cost reduction and enhanced performance. For example, this is how the business happens for example, this is an agriculturer or farmer. So, he tries to produce something, it comes to a person 1 and then, person 1 connects to person 2 and then, person 2 connects to person 3, person 3 tries to move towards a platform and then, it goes to a customer. So, at every phase 1, 2, 3, 4, four times people will try to add money, the x can be different, but it will add money and then, it will try to make the material, when it goes to the customer expensive.

So, now if I can try to introduce a e-commerce platform, which directly connects. So, all these things can be eliminated. So, that is what the Process innovation focuses on improving or transforming internal processes. How does a company work? How does a family work? So, all those things are internal process then, operation or workflow to achieve efficiency, cost reduction and enhanced performance. So, the processes are in used for streamlining and automation.

So, that is what we try to talk about IoT today and then efficiency and productivity, continuous improvement for these are the characteristics of the Process innovation.

Types of Digital Innovation

Example: Lean Manufacturing

- Minimizes waste and maximizes value in manufacturing operations.
- Utilizes practices like just-in-time inventory and continuous improvement.
- Reduces waste, improves quality, and increases productivity.

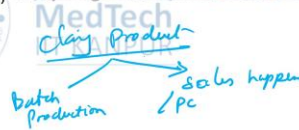


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So, lean manufacturing is a process innovation minimizing waste, maximizing the value in manufacturing product. For example, we have a clay product where in which, the firing happens in a batch production whereas, the sale happens in a piece by piece. So, in between these two, we have to do a packaging. When you do a packaging, we also have to do handling.

So, we use today robo, which is very very cost effective to handle and to better help in packaging. So, utilizes practices like, just in time inventory continuous improvement. So, all these things are process modification, it also reduces waste, improve quality and increases productivity.

Types of Digital Innovation

In addition to product and process innovation, digital innovation can be further classified into two types:

- Business model innovation
- Service innovation

1) Business Model Innovation:

Business model innovation involves creating or modifying the way a company

- Delivers value,
- Generates revenue
- Sustains competitive advantage in the market.

Characteristics of Business Model Innovation:

- Value Proposition - Redefine customer value of solutions their needs.
- Revenue Generation - New revenue streams of pricing model → digital marketing
- Market Disruption - innovate business model.

So, the addition to product and process. So, we also have in Digital Innovation, Business Model Innovation and Service Innovation.

So, innovation product process. So, again here, Incremental, Radical. So, product can be two process, can be two and apart from this, we are trying to talk about business and

service. Business Model Innovation involves creating or modifying the way a company deliver value, generates revenue and sustains competitive advantage in the market. So, that is Business Model.

How do you reach out to the customers? For example, if you try to put a online purchase of a craft item. So, they deliver it within a short time, in a right time, in a right condition, in a right quantity, at the right moment. If they do it, then the delivery value increases, then when you try to deliver, if it is packed properly in a colorful attractive box, then delivery value increases, then this generates revenue and sustains competitive advantage. The characteristics of Business Model Innovation is going to be a value proposition. So, where in which, we try to redefine customer value and address their needs value proportion.

Revenue generation is exploring new revenue streams and pricing model. For example, in India, today we do lot of transaction through digital money. We have a wallet, in the digital wallet, we put money there and then, when we scan a QR code, money is getting transferred. Market Disruption: So, we try to do disruptive industries and we try to develop innovative business models. So, these are some of the characteristics of Business Model Innovation.

Types of Digital Innovation

Example: Airbnb *Business innovation*

- Business model innovation in the hospitality industry.
- Connects travelers directly with hosts for accommodations.
- Disrupted traditional hotels with a unique rental platform.
- Creates new revenue streams for homeowners.
- Provides travelers with affordable and personalized lodging options.

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airbnb

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So, can we see what is a Business Model Innovation? Example is Airbnb. Business model innovation in hospitality industry was done by Airbnb. So, connected travelers directly with the host for accommodation, disrupted traditional hotel with a unique rental platform, then created new revenue streams for house owners, provides travelers with affordable and personalized lodging options.

So, all these things are business innovation. In the same way, we can connect with artists, same way, we can connect with people who extract honey, in same way we can connect with perfume making. So, all these things can be made through digital innovation where in which, it can try to give a big revenue for the artisans or craftsmen.

Types of Digital Innovation

2) Service Innovation:

Service innovation involves creating new or improved services that

- Provide value,
- Enhance customer experiences, and
- Address evolving needs and preferences.

Characteristics of Service Innovation:

- Customer-Centricity
- Service Delivery Transformation
- Differentiation


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The service innovation involves creating new or improved services that can provide value, enhance customer experience, address evolving needs and preferences. The characteristics can be customer centric or user-centric which we have already dealt, then Service Delivery Transformation and Differentiation.

Types of Digital Innovation

Example: Uber

- Service innovation in the transportation industry.
- Mobile app platform for convenient ride booking.
- Upfront pricing, driver ratings, and cashless payments enhance customer experience.
- Disrupted traditional taxis with a more convenient and efficient alternative.



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So, the example is Uber. Uber provides service innovation in the transport industry, mobile app platform for convenient ride booking.

So, ride booking is initially used to do it as 1 percent shared driving, all those things. Then, you have upfront pricing, driver rating, cashless payment, enhance customer

experience and disruptive traditional taxis with a more convenient and efficient alternative. This is a service innovation, which has happened under Digital Innovation.

Key Technologies Driving Digital Innovation



Digital innovation is powered by several key technologies that enable transformative advancements.

Key Technologies Driving Digital Innovation:

- Artificial Intelligence (AI)
 - Mimics human intelligence for tasks like speech recognition and decision-making.
 - Analyzes data to automate processes and improve efficiency.
- Big Data
 - Involves large volumes of structured and unstructured data.
 - Provides insights for innovation, customer experiences, and operational optimization.
- Internet of Things (IoT)
 - Network of interconnected physical devices and objects.
 - Enables automation, remote monitoring, and data-driven decision-making.

So, the key technologies driving digital innovation are going to be Artificial Intelligence which mimics human intelligence for tasks like, speech recognition and decision making, analyzing data to automated processes and improve efficiency. Big data involves large volume of structured and unstructured data, provide insight for innovation, customer experience and operation optimization.

Next is Internet of Things, network of interconnected physical devices and objects, the enabling automation, remote monitoring and the data driven decision making.

Key Technologies Driving Digital Innovation



- Blockchain
 - Distributed ledger technology for secure and transparent transactions.
 - Ensures trust, transparency, and accountability.

These key technologies drive digital innovation, revolutionizing industries and unlocking new opportunities for businesses and society as a whole.

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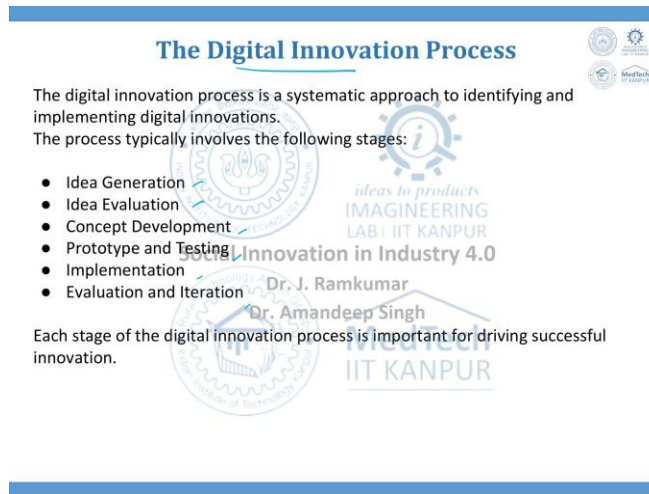

Blockchain is a new word which is disrupted ledger technology for secure and transparent transactions, ensure trust transparency and accountability in a big way by using Blockchain. These key technologies drive digital innovation, revolutionizing industries and unlocking new opportunities for business and society as a whole.

The Digital Innovation Process

The digital innovation process is a systematic approach to identifying and implementing digital innovations. The process typically involves the following stages:

- Idea Generation
- Idea Evaluation
- Concept Development
- Prototype and Testing
- Implementation
- Evaluation and Iteration

Each stage of the digital innovation process is important for driving successful innovation.



So, here if you look at the digital innovation process, it has Idea Generation, Idea Evaluation, Concept Development, Prototype and Testing, Implementation and Evaluation and Reiteration. These are the steps which are involved in the Digital Innovation process. Each stage of innovation process is important for driving a successful innovation.

Identifying Digital Opportunities and Challenges

Identifying digital opportunities and addressing challenges is a crucial step in the digital innovation process.

Techniques for Identifying Opportunities:

- Market Research
 - Analyze customer needs, market trends, and emerging technologies.
- User Feedback and Insights
 - Collect feedback to understand user preferences and pain points.
- Competitive Analysis
 - Study competitors' offerings and identify market gaps.



To identify the digital opportunities and challenges, the techniques for identifying opportunity are market research, user feedback and insight and competitive analysis. Customer need, market trends and emerging technologies are done by market research. Collect feedback to understand user preferences and pain points which tries to talk about user feedback and insight. Competitive analysis helps to study the competitors offering and identify market gaps.

Identifying Digital Opportunities and Challenges

Techniques for Overcoming Challenges:

- Experimentation and Prototyping
 - Validate ideas, gather feedback, and refine concepts.
- Collaboration and Partnerships
 - Collaborate with experts and partners to access resources and knowledge.
- Agility and Adaptability
 - Embrace change, adopt new technologies, and foster a learning mindset.

Then, it is Experimentation and Prototyping, we validate ideas, gather feedback and refine concepts. Collaboration and Partnership, we try to collaborate with experts and partner to access resources and knowledge. Agility and Adaptability is also a challenge to identify in digital opportunities. So, Agility and Adaptability embrace change, adopt new technology and foster a learning mindset.

Trends and Emerging Areas in Digital Innovation

The digital innovation landscape is constantly evolving, and there are a number of trends that are shaping the way we live and work. These trends include:

- Artificial Intelligence (AI)
- Blockchain
- Robotics
- Data Analytics

So, the trends are going to be using AI, blockchain, Robotics and Data Analytics in the area of digital innovation.

Trends and Emerging Areas in Digital Innovation

In addition to these current trends, there are a number of emerging areas in digital innovation that are worth watching. These areas include:

- Augmented Reality (AR):
 - Superimposes computer-generated images on the real world.
- Virtual Reality (VR):
 - Creates a simulated environment for user interaction.
- Quantum Computing:
 - Uses quantum mechanics principles for complex problem-solving.

The augmented reality is also coming up in a big way which superimposes computer-generated images on the real world. Virtual reality creates a simulated environment for user interaction. All these things are coming up in a big way. AR, VR for tourists are also coming up. Today, there is a huge drive in virtual reality towards pilgrimage tour and where in which, people try to run this VR in their shops.

So, that they get to know more details about the tourist spot and they make a living out of it. Creates a simulated environment for user interaction and quantum computing. Use quantum mechanism principle for complex problem solving. For example, microeconomics, we try to use quantum computing to solve problems.

Summary

- Digital innovation involves using advanced technologies and creative approaches to transform traditional practices, improve efficiency, and introduce novel solutions.
- Examples of digital innovation include virtual reality in education, blockchain in supply chain management, AI in healthcare diagnosis, and business model and service innovation.
- Key technologies driving digital innovation include AI, big data analytics, IoT, and blockchain.
- The digital innovation process involves identifying opportunities and addressing challenges through techniques like market research, customer feedback, skill development, and collaboration.

* Assignment :- Digital innovation happened in Health Care industry.

To summarize the entire lecture, Digital Innovation involves using advanced technologies and creative approaches to transform traditional practice, improve efficiency and introduce novel solutions.

The examples of Digital Innovation includes Virtual Reality in education, Blockchain in Supply Chain Management, AI in healthcare diagnosis and Business Models and Service Models. The key technologies are going to be AI, Big Data, IoT and Blockchain. The Digital Innovation process involves identifying opportunity and addressing challenges through techniques like market research, customer feedback, skill development and collaboration. These are some of the references. So, I would like to give an assignment, try to identify digital innovation which has happened in healthcare industry.

At least try to look for 5 innovations, make a 10 page report and just do not copy the name, it has to be what is the technology? how do they do? how have they improved? what is the pain point for the customer? how did they address? All these things you should try to note down in your assignment and then make a report. Thank you very much for your patience here.