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Subject Notes
Open Elective CS803 (D) Managing Innovation and Entrepreneurship
UNIT IV

Course contents:
Innovations aimed at humans, role of co-creation in the innovation process. The strategy of innovation process, types and selection of appropriate strategies

Course Objectives: To learn Automation technology, design valuable projects and innovation strategies.

Course Outcomes (CO4): Students will be able to explain the various strategies of the innovation process.

Innovations aimed at humans: Human versus machine matchups in chess illustrate how humans will need to continuously change their roles relative to smart machines. Back in 1996 and 1997, IBM's Deep Blue competed against world champion Garry Kasparov and became the first computer ever to beat a world champion in a six-game match, as with other chess programs, Deep Blue's strategy blended computing power and strategic knowledge of the game provided by human experts. People could sharpen their skills by playing against it and studying its moves, but they wouldn't learn anything new, per se. But now the competence of chess programs has risen to the point where many chess masters use them to improve their own level of play. At the end of 2017, a new chess milestone was achieved when Alpha Zero software, developed by Alphabet's Deep Mind, learned how to play solely on the basis of its knowledge of the rules.

- Changes in the human-machine relationship will emerge in the workplace, too, as AI becomes increasingly intelligent.
- It will not be a spontaneous process but will be induced by designers and users of intelligent technologies and, of course, by companies those innovate on the basis of such technologies and have the right human resources in place to make it happen.
- Major changes in jobs and skills don't coalesce overnight, even when the approach involves hiring new employees instead of retraining existing ones. Once companies identify the needed changes, implementing them will take time.

In the future, organizations will need to place both adoption of technology and human capital development at the center of their innovation strategies. As time goes on, how companies deploy technology and human capital will have a tremendous impact on their competitiveness and their very survival. We see four basic scenarios playing out in the organizations we have worked with:

1. Minimal investment in automation technology and people:

- A variety of reasons including cost and lack of vision or knowledge, especially among executives some companies delay making the kinds of fundamental decisions and commitments that will make them viable AI innovators in the future.
- They under invest in the necessary technologies and human capital. Such reluctance to enact changes will inevitably lead to a loss of competitiveness and an inability to maintain a sustainable business.
- These companies will have higher labor costs, fewer intelligent products and services, and lower levels of customer service than their competitors.
- Companies without intelligent robo-advisers are already losing business to competitors such as Vanguard and Charles Schwab that offer low- or no-cost advice.

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2. Heavy investment in automation technology but little investment in human capital:

- Some companies we have worked with are willing to make major investments in automation but are prepared only to make incremental changes in job design and training, expecting that the technology itself will bring about organizational transformation largely through improvements in efficiency and productivity.

- Take chat bots, which many companies are using to handle relatively simple customer service tasks. Starbucks, for example, uses chat bots to notify customers when their orders are ready; Master card uses them to make it easy for customers to get information on their transactions. (For more complicated problems, human agents typically take over.) To the extent that such companies reconfigure jobs or processes and help workers learn how to work with the technology, the chat bots can provide synergies, or at least a better distribution of tasks. Unfortunately, automation doesn't always work this way. For example, in 2017, Tesla invested heavily in robots for manufacturing and underinvested in skill development for human workers.

- When it realized that the robots weren't doing enough to help the company meet ambitious production goals for its Model 3 cars, management backed away from its reliance on robots and hired and trained humans to perform the necessary tasks. But for the final vehicle assembly, Tesla took a more nuanced, integrated approach, assigning humans to the complex tasks and using robots for specialized tasks such as moving goods around the factory, lifting heavy components, and testing seats.

- The result was, as one observer put it, a delicate dance of human workers and robots on the production line.

3. Incremental changes in jobs and skills with little investment in intelligent technologies:

- Many companies that prioritize incremental process improvement (for example, using Six Sigma or "lean" programs) don't invest enough in new technology in part because the methods don't include a role for technology.

- It can be difficult to adopt broad, cross-organizational changes in jobs and technologies at the same time because the impact of AI and other technologies on jobs tends to be specific to particular jobs. Although it's true that hiring and retraining skilled workers can generate short-term improvements that approach alone won't lead to meaningful change.

- Indeed, we have found that unless companies are willing to commit resources to AI technologies, they risk falling behind competitors in both productivity and quality. Eventually, moreover, they hurt their ability to hire and retain quality knowledge workers, who may see better opportunities elsewhere. Of course, there are particular settings in which an emphasis on people-oriented strategies makes sense. High-end restaurants, for example, are less dependent on automation than are fast-food establishments. The same goes for fashion and other luxury businesses. But even in these cases, intelligent automation should have a growing presence in back-end functions and processes such as supply-chain management and customer support.

4. Significant investment in both intelligent technology and human capital innovation.

- Organizations with a broad-based investment approach are best equipped to pursue innovation in both AI application and human capital development. Rather than simply looking at automation as a way to cut costs, these companies create innovative products, services, processes, and business models by implementing intelligent technologies, redesigning jobs, acquiring new skills through hiring, and training their existing workers.

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- This approach is especially vital for companies that compete in markets dominated by global giants. For example, financial business units are actively trying to use both AI applications and human capital to drive innovation. One way it is doing this is by studying the needs of different types of employee users, or personas and then considering how they might be supported by technology.

- Personas are part of a widely used approach for understanding customer needs in marketing and product development, but they are rarely used for the development of internal systems and even less so to create AI systems.

- One of the personas is made up of employees involved with buying or sourcing industrial materials. A key task for these employees is to ensure that the needed materials are available on the manufacturing line at the right time. Historically, they relied on their intuition to manage the delivery schedules, but machine learning models have the ability to learn from past deliveries and provide model-driven estimates.

- Users are being trained to understand how the models work and how they can be improved. Today, the models inform the sourcing manager, who makes the final decision about when to order. Eventually, GE expects the AI systems will be capable of making decisions on their own to optimize things like delivery schedules and in-process inventory. The role of humans will be to weak the processes and address problems that occur.

- Despite the power of AI and other new technologies, the likelihood that they will replace managers and professionals in the near term is minimal. Rather, many observers, including Erik Brynjolfsson and Andrew McAfee, co-directors of the MIT Initiative on the Digital Economy, believe that the change will be more gradual — that those "who use AI will replace those who don't." In our view, the challenge for companies is finding ways to ease intelligent technologies into their organizations, while simultaneously determining how to take advantage of what intelligent humans have to offer.
  There is no simple recipe for successful innovation based on automation. Different companies will have different opportunities to put intelligent technologies to work. However, in researching knowledge and technology transfer within companies and advising organizations on AI adoption, we have developed a set of guidelines:

Start with management education:

- The best starting point is to invest in training for the executives charged with making the strategy decisions about intelligent technologies. Based on our experience, executive ignorance often leads to two opposite but equally negative behaviors: If leaders underestimate the potential of these technologies, their companies will miss opportunities to benefit from them.

- On the other hand, if they overestimate it and initiate projects that are too ambitious and costly, they will waste resources and perhaps even generate a bias within the company against new projects, even those that are reasonable.

- To prepare leaders to make future decisions, a leading property and casualty insurance company, for example, held daylong sessions for top executives on what AI is, how best to manage it, and what it might mean for employees. Anthem Insurance Companies, a large health insurance corporation, and Bank of America have run similar sessions for their leaders and board members.

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Develop a road map for future initiatives involving technology and people:

- As with any project, implementing an intelligent automation initiative requires having a road map that describes the objectives, the necessary resources, and the implementation schedule.

- A good road map should help the organization anticipate the potential benefits beyond the most obvious ones and should include a communication strategy, both internal and external, especially when intelligent automation projects might lead to a reduction in jobs. For example, Situm Technologies, a Spanish startup developed technology that accurately tracks the location of people and assets via Smartphone's inside facilities such as hospitals, airports, and factories.

- The initial applications were fairly narrow an early customer in the building security business wanted to track the routes of its security guards. Eventually, however, the company developed a road map for using Situm's technology within facilities in other ways for example, to manage people during emergency situations such as fires or assaults.

- This enabled the company to offer a set of solutions that aligns the benefit of optimizing human resources with safety.

Focus on immediately valuable projects and be wary of initiatives that are too ambitious:

- Companies that lack significant AI experience should focus initially on low-hanging-fruit projects that will enable them to gain experience.

- Highly ambitious projects to treat cancer, provide individual investors with detailed investment recommendations, or eliminate drivers from cars have all either failed or taken far longer than researchers expected.

- Even Amazon has had challenges with its Amazon Go stores, and its drone delivery project is taking a long time to emerge.

- Combining several manageable projects in a single business area often has a better chance of yielding significant results than trying to pursue one big one. At Amazon, for example, CEO Jeff Bezos says that many of the company's investments in machine learning are focused on "quietly but meaningfully improving core operations." If the company's strategic focus is on using AI to enhance customer relationships, for example, the component projects might include chat bots or intelligent agents to answer questions quickly 24-7, machine learning models to capture the "voice of the customer" from call center operations, recommendation engines to pitch promotions only to customers with high interest, and so forth.

- This incremental approach also creates more time to redesign work and re-skill workers, since each AI-supported task will typically require only incremental change in jobs. The objective should be clear even in cases where the goal is automating tasks previously performed by workers key workflows should be designed or redesigned, focusing on the division of labor between humans and smart machines. The aim throughout should be innovative and effective work design, not just cost reduction.

Invest in building internal staff capabilities:

- Identify the workers who will adopt the solution and train the staff in its use. Ideally, some people would be involved in the development of the AI system serving, perhaps, as process or subject-matter experts. Given their expertise, they can be lead users of early versions of AI systems and provide feedback on what works and what doesn't.

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- HR and corporate learning departments can partner with these individuals to structure training programs for other workers affected by the systems.

- To innovate around intelligent automation, you should plan to develop or hire your own people as opposed to only borrowing them from consulting firms or vendors. For example, training chat bots requires a deep understanding of the business and current and evolving customer or internal user requirements, which are things that experienced employees inside the company can best provide.

Plan on making improvements over time:

- Obviously, whatever technologies you use should be suited for the projects at hand. However, intelligent technologies are improving quickly, which means that innovation based on automation needs to be continuous rather than episodic. For example, recent advances in natural language generation enable organizations to incorporate narrated reports into their business intelligence applications.

- This new capability may greatly increase the ability of non-experts to understand technical and financial reports, which may decrease the need for human or AI-based customer service. Leading companies such as USAA, an insurance and financial services company, are working along multiple lines chat bots, virtual assistants, and narrative generation to facilitate better customer communications, and therefore they must constantly monitor the relationships among the various tools.

Role of co-creation in the innovation process:

- Adding value to your brand is becoming more critical and more challenging as markets are flooded with alternative innovative solutions that command consumer attention. The edict, "innovate or die" was first coined in 1981 by Jack V. Matson who authored a book carrying nearly three decades later; it was popularized by the legendary Peter Druker. Nowadays, it's widely adopted as a business imperative.

- Markets are dynamic, customers can be fickle and it is essential to maintain a connected brand to keep your pulse on what's changing. Customer engagement is necessary to inform your business and new product development strategies. Formalizing how you do so, via co-creation innovation, can boost your brand, your business and your revenue.

The strategy of innovation process:

- Strategy is about making choices between a number of feasible options to have the best chance at "winning", and innovation is just one of the means to achieve your strategic goals. Without a good one, it's actually quite difficult to achieve long-term success and orient your business for speed in order to secure competitive advantage. What's interesting is that according to statistics, a lot of executives have defined innovation as a strategic priority. However, the lack of clear innovation strategy is a fundamental problem especially for established companies when optimization of existing business becomes a priority.

- While developing an innovation strategy isn't necessarily difficult in itself, aligning it with your overall business goals and ways of working is what takes most of the time and effort. This time, we've decided to try to make sense of the broad topic by introducing five steps for developing your own innovation strategy. In addition, we'll introduce a few tools that can be used when mapping your strategic goals in order to make the best choices for long-term success.

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Figure 4.1: The Strategy of Innovation Process

- Innovation is about creating new value people are willing to use and pay for, whereas strategy is the plan for harnessing for example marketing, operations, finance and R&D to support achieving the competitive goal. To clarify, innovation strategy isn't about innovation tactics, such as setting up an idea challenge, but more about mapping organization's mission, vision and value proposition for defined customer markets.

- It sets boundaries to your innovation performance expectations by simplifying and structuring your innovation work to achieve the best possible outcome. Before moving forward, it's important to mention that your innovation goals shouldn't be separated from your overall business objectives as having a unified vision and common goals for innovation will help fight the silo effect and increase your operational efficiency.

- If you think about marketing, for example, you wouldn't want to separate your marketing strategy from your overall business objectives but rather make sure your marketing strategy and initiatives help contributing to your overall business plan and vision. The same goes for innovation. There's no point of innovating just for the sake of it, as it has to contribute to your bigger plan. So, before starting to develop an innovation strategy, make sure you're aware of how innovation helps you to achieve your goals.

The Strategy Choice Cascade

- Building innovation into your strategy development process starts with making a deliberate choice of focusing on the best possible way to win as well as justifying the reasons behind that choice. Often, the best approach to this is to make a set of choices you're more capable of putting into practice compared to other players in your field. One relatively solid framework for making those strategic choices is The Strategy Choice Cascade.

  The purpose of the strategy choice cascade is to turn strategy from a complicated, messy and often deeply confusing and divisive chore, to a systematic and simple exercise.
  The cascade consists of five steps that can help develop and implement sustainable strategy at any organization

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Steps for Developing Your Innovation Strategy:

1. Determine objectives and strategic approach to innovation

- The first step in the strategy choice cascade is to define your winning aspiration, In other words, your innovation objectives and the why behind your innovation strategy. As any other strategy, the planning process of your innovation strategy starts with defining your objectives: What do you want to achieve with innovation? If we take a step back, think about your long-term business goals and the things that are most likely to drive your business forward even after some time.
- As already mentioned, your innovation strategy should help supporting your business objectives and vice versa. An example of a good strategic approach introduced in Playing to win is Olay. Olay's winning aspiration is to become a leading skin care brand that wins convincingly in their chosen markets and channels. Along with hair care, it will help establish a key pillar in the Procter & Gamble beauty-care business. It's likely that your approach to innovation will be something different.
- Typically, there are two different approaches to innovation strategy: business model innovation and leveraging existing business model, Business Model Innovation is the development of new, unique concepts supporting an organization's financial viability, including its mission, and the processes for bringing those concepts to fruition. The primary goal of business model innovation is to realize new revenue sources by improving product value and how products are delivered to customers.
- The purpose of business model innovation is to address the choice of target segment, product or service offering, and revenue model. At the operating model level, the focus is on driving profitability, competitive advantage, and value creation. Business model innovation is the art of enhancing advantage and value creation by making simultaneous and mutually supportive changes both to an organization's value proposition to customers and to its underlying operating model, Business model innovation requires a deep understanding of your company's competitive advantage and can be approached in four different ways:

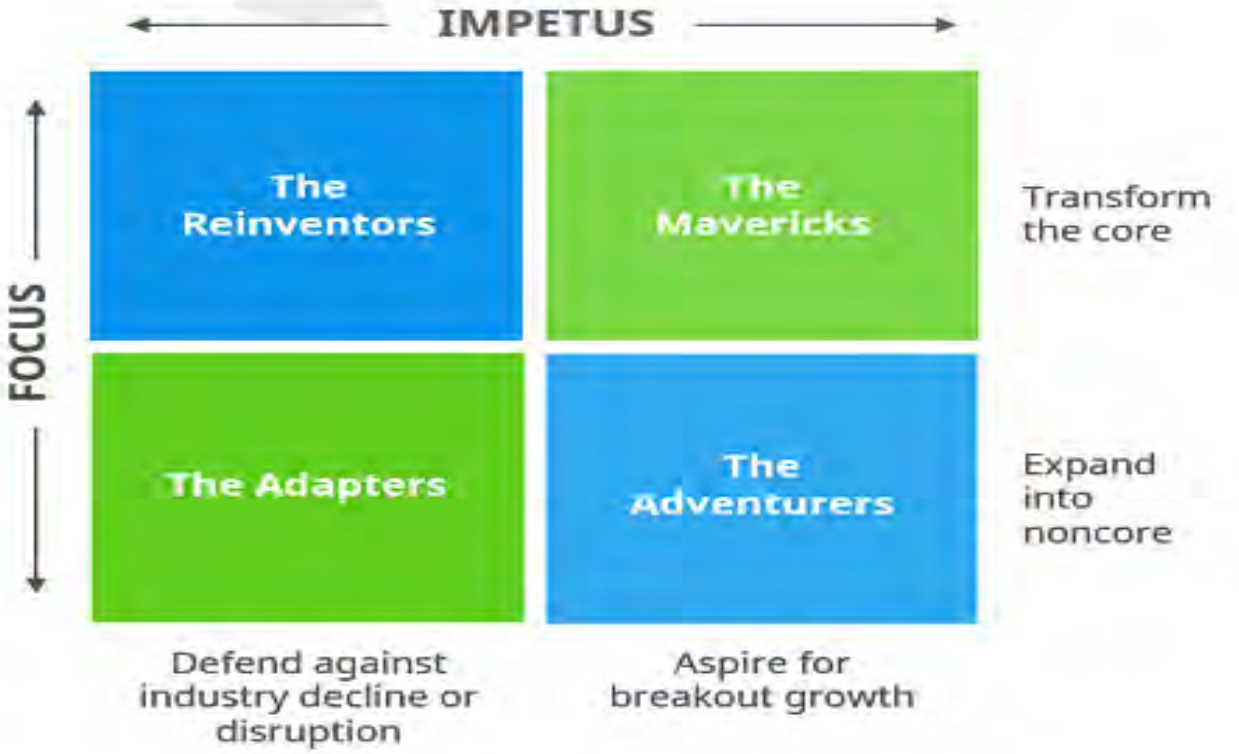

Figure 4.2: Strategic Approach to Innovation

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Leveraging Existing Business Model

- Leveraging existing business model refers to continuous improvements and incremental/sustainable innovations. As opposed to the business model innovation, the strategic focus with organizations that leverage existing business model is on improving the core business rather than building new business models to create new value. Based on these two approaches to innovation, we can identify three innovator archetypes:

Figure 4.3: Leveraging Existing Business Model

2. Know Your Market: Customers and Competitors

- The second step in the strategy choice cascade is defining the right playing field, as in, the market you're operating in and the customer segment you're offering value for. To be able to innovate and to respond to your customers' needs, you should listen and understand what your customers really want and remove the rest.
- To be able to do that, knowing what happens in the market is essential. However, because competitive needs are individual and often very specific, a strategy that worked for another player in your field shouldn't be copied but learned from. Although defining your playing field is important, your unique value proposition is what will make or break your innovation strategy.

3. Define Your Value Proposition

- Probably the most important step is to define that unique value proposition. How will you win? What type of innovations allows the company to capture that value and achieve competitive advantage? Because the purpose of innovation is to create competitive advantage, you should focus on creating value that either saves your customers money and time or makes them willing to pay more for your offering, provides larger societal benefit, makes your product perform better or more convenient to use, or becomes more durable and affordable compared to the previous product and the ones in the market.
- To be able to create a unique value proposition, the ability to identify and exploit new uncontested markets is recommended. This can be done through value innovation.

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4. Assess and Develop Your Core Capabilities

The first three steps in the strategy choice cascade really come down to one thing; your fundamental capabilities required for winning.

When assessing your set of capabilities that need to be in place, consider the following:

- Culture
- R&D
- Behaviors
- Values
- Knowledge
- Skills

For example, if you want to win at delivering breakthrough technology, you must have internal skills and knowledge to be able to build that. The ability to connect and develop these capabilities is key to innovation.

5. Establish Your Innovation Techniques and Systems

- Last but not least, to be able to execute your innovation strategy in a scalable and integrated manner, you should find out what systems need to be in place. Define: which innovation techniques and systems do we need in to be able to link our innovation infrastructure elements together? What are the most important systems that support and help measuring the results of our innovation strategy?
- According to a recent study, Christopher Freeman defines the system of innovation as 'the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies'.

Types and selection of appropriate strategies:

1. Incremental Innovation

This type of innovation involves increasing concepts, products, or services that are phased, gradual, and sustainable in the existing market. With Incremental Innovation, the new products are only slightly better than previous product or service versions and only in small changes to existing product formulations or service delivery methods. Products can be made smaller, more user-friendly or more attractive without changing the basic functions of the product, and services can be made more efficient through continuous improvement.

2. Disruptive Innovation

Disruptive innovations are theories related to concepts, products, or services that create new value chains by entering existing markets or creating completely new markets. Disruptive innovations are initially less effective when measured using traditional value metrics, but have different aspects that are evaluated by small market segments. Such innovations can often turn non-customers into customers, but not necessarily meet the needs and preferences of core customers, at least not yet. What makes disruptive innovation difficult is that established organizations are truly rational when making decisions relating to their existing business.

3. Sustaining Innovation

Sustaining innovation is the opposite of disruptive innovation because it exists in the market today and instead of creating new value networks, existing ones are improved and expanded to meet customer needs. As with incremental innovations, the support metrics for product innovation increase slightly with each iteration, reducing errors. Newly updated products may be more expensive and have higher margins than before if they appeal to more demanding high-end customers with better performance than before. However, it can be cheaper if it leads to a greater amount and therefore higher absolute profits.

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4. Radical Innovation

Radical innovation is rare because it has characteristics similar to disruptive innovation, but differs in the way that it uses revolutionary technology and new business models at the same time. It even offers solutions to needs and problems that we didn't know we had and changed markets or even the whole economy. Although radical innovations are rare, there have been more of them in the past. Technological innovations such as PCs and the Internet are examples of radical innovations that have changed the way the world works and communicates.

5. Product Innovation

Product innovation is perhaps the most common form of innovation and is related to improving the nature and characteristics of the product. Different components of the previously produced product can also be used. Product innovation is always real, can involve fundamental new technologies, or can build combinations of existing technologies in new ways, even though they may not involve technology at all. Product innovation can be a new product that has never been seen before. Rotation widgets, or can be the latest version of existing products, e.g., a second-generation wireless headset or Amazon Echo.

6. Service Innovation

Service innovation is a concept, product or service process that is significantly improved in new or existing markets. For example, this could be a new client interaction or distribution channel, a system that improves the transmission process, or a new solution in the client interface. The way you serve customers is a great way to differentiate yourself, generate more value for them, and generate more revenue for your business. A big part of a successful business is that it makes your customer's life easier. The better you meet the needs and expectations of customers, the better your future. Uber is an example of an innovative service company that has created growth beyond its core business.

7. Process Innovation

This process combines the skills, technology, and structure with which products are produced or services are provided. Process innovation usually refers to the adoption of new or better production or shipping methods. It can also refer indirectly to company products and services, for example in the form of an HR support or funding process. Process innovation can occur through the use of new technology or improved process methods and is often done to save time and money or to serve customers better. They are often new technologies, devices or software, and cultural or structural changes may often be needed. The final product usually does not change during the innovation process, but the method of spending the product increases.

8. Technological Innovation

Technology as a source of innovation can be identified as a critical success factor to increase market competitiveness. Technological innovations include new or improved technologies, such as new types of machinery or technological changes in relation to products, processes or services. For example, when it comes to incorporating technology into the manufacturing process, it enables automation, which leads to higher levels of production, lower unit costs and more efficient use of materials – which reduces variability and leads to more consistent product quality.

9. Business Model Innovation

In all its simplicity, the business model is the way companies work and make money. It consists of core values and resources, strategies, core channels, and target customers, to name just a few. Business model innovation is a fundamental change in the way companies provide value to their customers or differentiate them from the market. In practice, this often happens through the development of new pricing mechanisms, sources of income or sales channels, but not limited to this. The challenge for

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innovation in business models is that skills and processes that are optimized for company success become targets of transformation. To create a viable new business model, you usually need to change the fundamental decisions that your company is working on. In other words: work on disruptive innovations.

10. Marketing Innovation

For innovation to be successful, people need to find it and then benefit from it. The main objective of marketing innovation is to open new markets or increase market share. Innovation is usually seen as marketing innovation if it significantly changes the "traditional" marketing mix (4P: price, product, advertising, and location) of the industry concerned. The ability to connect with your customers is key, and there is always room for improvement in customer relationships and engagement. Due to ever-evolving technology and customer preferences, new marketing innovations are needed to promote new and existing products and services. By combining it with innovative marketing methods, you can enhance this customer relationship in ways they don't even expect.

11. Architectural Innovation

Architectural innovations describe the reconfiguration of existing product technologies that bring improvements in the way components, some of which are not necessarily innovative, are combined together. Some examples of architectural innovation are computer network systems and flexible manufacturing systems, where the main components of a product remain the same, but the relationship between these components and their relationships with one another changes less risky than other types of innovation because of the function of technology has been proven. In this way, you don't need to invest time or money to test the functionality of this technology component in practice. You just need to make sure they work together.

12. Social Innovation

Social innovation is a new practice or technological invention that aims to better meet social needs rather than existing solutions. Such innovative solutions can be provided or funded by public or commercial entities. There are many reasons why social innovation is important. For example, improving working conditions, providing more education, developing communities, or improving population health

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