AI in Marketing
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Week 2
Lecture-11 Transforming Marketing Strategy using AI-V

Welcome to this NPTEL online certification course on artificial intelligence in marketing and now we will start with module 11. So, as you can see from this slide, we are talking about transforming marketing strategy using AI. So, we have been talking about this topic in module 7, 8, 9, 10 and we will continue with that in this module and finish that off. So, this is part 5 of this, this chapter and module 11. Now let us look at what are the things that we will cover in this module. We will start with understanding how to build sustainable competitive advantage using artificial intelligence.

Then we will understand what is strategy for AI and strategy with AI. So, these are the two differentiating factors here. Then we will explore AI backed key performance indicators, optimizing and prioritizing KPIs with the help of AI. How should we do that? Optimizing and prioritizing.

Then we will study the integrated strategy machine. After that we will understand the hybrid intelligence and recognize different types of transformations needed to achieve this hybrid intelligence. So now let us start with understanding how to go about building sustainable competitive advantage using artificial intelligence. So, AI now has a firm footing in organizations strategic decision-making process. So now it has become a integral part of this strategic decision making process.

5 years ago less than 10% of large companies had adopted machine learning or other forms of AI. But today 80% of them make use of this technology. That is why it has now taken this strategic connotation. Whether it is a major integrating algorithm into its recruiting processes or Walmart using AI for decisions about product lines. Such examples show that the use of AI now transcends mere process automation.

So it is not only about the process automation and that AI is increasingly being used to augment decision making processes at all level including the top management, middle management and the lower level. In the boardroom companies can use the power of AI to analyze information, recognize the complex pattern that emerges from this analysis of information and even give advice on strategic issues. This predictive technology can help executives handle the increasing complexity of strategic choices. So now you see that this choice-making process is becoming more and more complex. How it can help by

offering new perspective and insights for consideration which can help organizations gain competitive advantage.

We are now at a point where competitive advantage will derive from the ability to capture, analyze and utilize personalized customer data at scale. So now this is what will lead to competitive advantage. The capturing, analysis and utilization of personalized customer data and from the use of AI to understand, shape and optimize the customer journey. So, we have to then understand, shape, customize and optimize the customer journey depending on each customer. The long term sustainable competitive advantage hinges on a firm's ability to collect first party data and use it to ease the purchase process.

How by personalizing the customer experience online and everywhere. So that is seamless omni-channel experience. So, this is what we are looking at. So that is possible with the use of AI. Otherwise with standalone apps etc that becomes difficult to achieve.

Now strategy for and strategy with AI. Developing a strategy for and a strategy with a capability is complementary. So, we have to develop a strategy for AI and strategy with AI. For example a strategy for sustainability such as lowering one's carbon footprint or reducing waste cannot be diverse from having a sustainable overall strategy enabling the business to operate in a sustainable manner. So, this cannot be achieved in a standalone way.

It has to be integrated in the overall strategy. Similarly, a strategy for AI should not be viewed as a substitute for creating a strategy with AI. So, these are two different things. Strategy for and with. Like any corporate strategy a strategy with AI expresses what enterprise leaders deliberately seeks to emphasize and prioritize over a given time frame.

So this is what is strategy with AI is. Emphasize and prioritize over a given time frame. Studies articulate how and why an organization expects to succeed in its chosen market. Whatever the specific strategy, virtually all organizations create corresponding measures to categorize and communicate the desirable strategic outcomes. So, the problem or the situation is that every company will have a specific strategy so that they can categorize and communicate the desirable strategic outcomes.

Now let us look at the key performance indicators that is the KPIs. In the age of AI strategy is defined by the key performance indicators a firm chooses to optimize. So, we are we are now to optimize this, and we are not talking of maximizing. These are the measures organizations used to create value, accountability and competitive advantage. So, this KPI should cover creating value, accountability and the competitive advantage.

In the data rich, digitally instrumented and algorithmically informed markets. AI plays a critical role in determining what KPIs are measured, how they are measured and how best to optimize them. In an always on big data world your system of measurement is your strategy. So how you measure is your strategy. So prioritizing KPIs that is ranking them according to what matters most and what the organization must learn is essential to enterprise strategy.

So what matters and this will keep on changing in the dynamic world and what the organization know and what they have to learn. Because these KPIs keeps on changing so company will have to keep on learning. Determining the optimal metrics mix for key enterprise stakeholders become an executive imperative. Now how to optimize the key performance indicators? Further optimization does not mean maximization or minimization. On the contrary it means computationally learning and understanding tradeoff among and between competing and complementary KPIs.

Two types of KPIs one is competing another is complementary. How the tradeoff happens between competing and complementary? For example, are customer centric strategies better optimized via customer lifetime value or balanced blends of earning before interest, taxes, depreciation and amortization and the net promoter score. So, some of these indicators can be complementary while some can be competing. For what customer segment should profitability be privileged over satisfaction or loyalty? So, there may be 1, 2, 3 customer segments. But then all three will not have the same in performance indicators.

They have different. Somewhere it will be profitability, somewhere it is satisfaction and somewhere it may be loyalty. This optimization demands a rigorous rethinking of the metrics chosen to define desirables and undesirable strategic outcomes. AI transforms the strategies choice about which KPIs to optimize and how to optimize them. So now AI will tell what should be the metrics for one customer, what should be the metrics for the second and what should be the metrics for the third and how to optimize them. Leaders need to recognize that nowadays strategy is about optimizing KPIs.

How? With artificial intelligence and machine learning. So now in nowadays all this strategy is about optimizing the key performance indicators and AI has a strategic role in achieving these KPIs outcome and more importantly suggesting new KPIs. Optimizing known KPIs is important but not strategically sufficient. So that is the problem.

This KPIs will change. What may be known today may not be sufficient enough and we have to look for what we do not know. When appropriately trained machine learning models can learn to identify and recommend novel and engagement KPIs. That is

machines can learn to discover enterprise KPIs on their own without expert guidance. So now machines are learning to discover the APIs that we do not know. For example, GE Healthcare marketing data team increasingly uses machine learning to find KPIs that might never have been discovered on their own.

In marketing, promotion, interaction and engagement, domains technology can go beyond learning to optimize to suggest what can and should be optimized. So, it is not about how to optimize but what can and should be optimized. Google's YouTube division introduced a new internal metrics in the past two years for gauging how well videos are performing and that is called quality watch time. A statistics with a noble goal to spot content that achieves something more constructive than just keeping users glued to their phones. The changes are supposed to reward videos that are more plattable to advertisers and the broader public.

Creating the right metrics for success should help marginalize videos that are inappropriate or popular among small but active community with extreme views. It could also help YouTube ward off criticism that its service is addictive and socially corrosive and help in curbing the spread of toxic content. Now how to go about building sustainable competitive advantage using artificial intelligence? For that we will first understand the integrated strategy machine. What does it takes to translate technological advances into strategic advantage? How this technological advances be converted be translated into strategic advantage? Can strategy be trusted with AI? So that is the big question. Technology enhanced strategy can be realized only in the context of an integrated strategy machine that is a collection of resources.

So this integrated strategy machine is a collection of resources both technological and human that act in concert to develop and execute business strategy. It comprises a range of conceptual and analytical operations to include problem definition, Signal processing, pattern recognition, abstraction, conceptualization, analysis and prediction that connects into a seamless whole. This alignment of individual operations towards the overall aim makes the strategy machine integrated. So, these alignment integration of these individual operation that leads to this strategy machine integration. Effective business strategy development with or without technology must accommodate reframing that is the process of redefinition and reanalysis of the problem considered to be at the heart of effective business thinking.

So we have to redefine and reanalyze the problems. To enable reframing the strategy machine must expand the end-to-end process of strategy development and implementation. Rather than formulating a strategy in a vacuum the strategy machine must continuously update and improve strategy by analyzing feedback and execution

data. So, this strategy is not a standalone thing and it has to be changed continuously updated and improved by analyzing the feedback and the execution data. There needs to be a constant interplay between upstream and downstream strategy element of the strategy machine.

Although machines and algorithms can play increasingly large and important role in strategy making and execution. The integrated strategy machine must at least for now be designed by human beings and not only by technology or AI. So, people must assemble the machine and direct it towards a strategic aim. It is important to understand why. Human beings are still unique in their capacity to go meta that is to think outside the immediate scope of a task or problem.

Machines cannot yet do that well. They are good at executing a well-defined task or solving a well-defined problems but they cannot pose new questions. So, their limitation is that they cannot pose new questions or connect a problem to a different one they previously faced. So currently only humans can do that. In other words, artificial intelligence is still far from being general. Of course this is not to say that machines are incapable of learning these higher order skills.

Technology will play a large and a larger role within the strategy machine. Amazon provides an excellent example for an integrated strategy machine. The company has at least 21 data science systems including several for a supply chain optimization. An inventory forecasting system, a sales forecasting system, a profit optimization system, a recommendation engine and many others. These systems are intervened with one another and with human strategist to create an integrated well-oiled machine.

So all these all these systems along with human strategies. So that creates this integrated well-oiled machine. For example, if the sales forecasting system detects that the popularity of an item is increasing, it triggers a cascade of changes. The inventory forecast updates causing the supply chain system to optimize inventory across warehouses. The recommendation engine pushes the item more and the profit optimization system adjust prices.

These changes in turn update the sales forecast. So whole of this strategy machine is at play. There is only some of the first order effects and further interactions occur downstream. So, this is only one layer. This may affect several other layers down the line.

Now the requirements and the pitfall of an integrated strategy machine. How can business create an effective integrated strategy machine? Boston Consulting Group, that BCG has

highlighted six requirement for this integrated strategy machine. The first is a relevant specific strategic aim. The integrated strategy machine must be directed at the relevant aim or desired outcome. Humans must provide the initial question or insight into where the opportunity lies.

So humans will provide this initial question or insight into where the does the opportunity lies. Whereby a group of people may be able to accommodate ambiguity and find the right aim through self-organization, the strategy machine needs an explicit aim. The opposite of having a relevant specific aim is asking the wrong question. Powerful technology can cause us to do that by preoccupying us with what it can do rather than what it should do. The machine's capabilities rather than human needs then dictate the problems that we solve.

In other words, if all you have is a hammer everything looks like a nail. So that is a very good analogy. The second is a design appropriate to the aim. No strategy machine can be effective in all situations. Just as different environments call for different strategies, therefore different strategies call for different designs of integrated strategy machines.

For example, strategies in stable classical environments require a process to analyze, plan and execute and adaptive strategies in less predictable conditions requires a process that can be categorized as very select scale. The degree of variability and malleability that a strategy must accommodate suggests the optimal approach to developing and implementing it. Form must follow function. It is not the other way round. Much as the fox cannot eat out of a narrow necked vessel and the stroke cannot drink out of a bowl, a strategy machine without the right design cannot achieve its aim.

For example, a strategy machine designed to be the most effective in the classical environment would fail in a more malleable environment where companies must engage in such activities as collaborating with a diverse set of stakeholders and then building an ecosystem. The third is an integrated approach. The components of the machine, both human and technological, must communicate with one another to create an integrated whole. So, these both of them, they should be communicating with one another. Only then they will be able to create an integrated whole.

The integration is critical because aggregating local optima rarely leads to a global optima. For example, a strategist who wants to evaluate a new business opportunity may find, may need to consider competitive threats and strategic fit. Different components of the strategy machine could analyze those issues separately. But the strategies will be no closer to an answer unless there is a mechanism to integrate the analysis. So, this integration of the analysis and dissolve the trade-offs by generating new insights.

It is easy to ensure that the components of the strategy machine share insights and coordinate their actions when only a few components are involved. However, as we ask increasingly complex questions, we risk losing coherence in our search solution. So that is another problem here. Therefore, human beings with their unique ability to understand broad context and collect insights from desperate spheres must design and optimize the flow of information and insights into the strategy machine. So, they, this is where the human beings get into the strategy machine.

Their role is to make sure that the components of the machine, that is both people and technology. So, these are the two components of this strategy machine, that is the people and technology. They both optimize for the global aim rather than for the individual operations. So, this strategy machines. Machine is looking for synergy rather than the collection of parts.

The fourth is the right human-machine division of labor. In an effective strategy machine, human beings and machines must each do what they are good at. Machines can usually perform tasks with a specific well-defined context more accurately and more quickly than people can. And they can process more data while doing so. So this integration, the right machine human, human-machine division is important because there are things where human are good at and there are things where machines are good at. So human beings are better at thinking beyond the specified context and dealing with ambiguity by for example reframing a problem, asking new questions and applying common sense.

When people and machines are not engaged in activities suited for their respective strengths, then thinking often stagnates. For example, machines can facilitate abstraction or the formation of new concepts by detecting signals and patterns. Nevertheless, they are still inferior to human beings in abstracting and conceptualizing, much less adding vigor to their thinking through iterative reframing. The fifth is a well-defined human-machine interface. So now when we have already defined what human will do and what machine can do, now we are looking at a well-designed interface between these two.

So the strategy machine can benefit from an appropriate division of labor only if there is the right human-machine interface. Machines must be able to communicate their observations to people. Conversely, people need to be able to understand, examine and validate those observations and provide feedback to the machines. And ineffective human-machine interface turns the strategy machine into a black box that create outputs that are untraceable. People cannot interpret them and therefore cannot build deeper and richer insights through successive reframing.

To avoid this pitfall, architects of the strategy machine must avoid the temptation to turn machine outputs into reductive visualizations or simplified patterns. People need to be able to probe the messy data from diverse perspective in order to gain rich insights. The sixth component of this is the unique tools, data, people and processes. The strategy machine has not fulfilled its ultimate purpose if it does not create an advantage.

Therefore, it must do something better than the competitors can do. Some aspects of the machine must be advantaged whether it is the tool, the data, the people or the design. The risk of relying on off-the-shelf solution, readily available data or old design is that the strategy machine becomes commoditized, a mere cost of doing business. Its output must be good enough, but they are not a source of differentiation. So, the outputs may be good enough but they do not lead to a source of differentiation and therefore a competitive advantage.

The integrated strategy machine must itself be capable of evolving. People and technology must each play their roles and humans must constantly evolve the design of the machine. So, this figure is the integrated strategy machine as envisaged by BCG. So, here the situation, signal detection, the values and objectives. So, defining the objectives and then comes the opportunity that is pattern recognition. Now, this goes to abstraction and human intuition, predictions, simulation, execution, analysis and then assessment and shaping influence.

This gives predictive simulation and then again it goes back to the definition of objectives. The implications of this integrated strategy machine. What strategic aims do I want to achieve with an integrated strategy machine? So, that is the question. The initial aim must come from human beings. As Bruce Henderson of BCG stated, the first definition of a problem is escapably intuitive.

It must be in order to be recognized as a problem at all. The initial problems that the strategy machine intends to solve, in other words, must be defined outside the machine itself. So, what technology, people and design do I need in order to achieve those aims? Different aims requires different capabilities, which are often costly and difficult to procure. The technology giants that have developed effective strategy machines such as Amazon and Google have done so by continuously investing in the integration of technology into strategy and paying a premium to attract best talent. Companies without such advantages must remain realistic about what it takes to build an advantaged strategy machine. What are the implications of this integrated strategy machine? So, how can people and machine complement each other? The goal of the integrated strategy machine is to enhance rather than inhibit human thought.

To do so, technology needs to stimulate people's ability to create new concepts, challenge their own thinking and reframe their understanding. Conversely, human beings must interpret the output and actions of machines in their broader context and guide them to perform increasingly relevant analysis. How can the strategy machine evolve? A successful strategy machine must be able to improve itself over time. It needs a mechanism to learn from its experience and continue to answer the right questions and provide novel insights. People who manage the machine must have the courage and discipline to periodically reevaluate and challenge its design.

How can the broader organization embrace the strategy machine? A strategy machine is valuable only to the extent that the organization embraces and uses it. Business leaders must pay attention to organizational realities and design the strategy machine accordingly. If the organization is not ready to rely on it, the machine may become irrelevant and ineffectual in driving the actual change. Now, let us look at how to go about building sustainable competitive advantage using AI.

So, that we are talking about the hybrid intelligence. Traditionally, strategic decision making has been a human task and business leaders often rely on their intuition for decision making. The rise in AI has exposed the flaws in traditional decision making and provides an opportunity to make more informed and foolproof strategies. However, artificial and human intelligence thrive at very different tasks. While AI is superior at data intensive prediction problems, humans are uniquely suited to the creative thought experiments that underpin the best decision. The key for to this effective collaboration is to recognize which part of a problem to hand off to the AI and which to the managerial mind.

We will be better at solving and how to collaborate between the two forms of intelligence that is the human and artificial and this is what makes it hybrid. The majority of work in the digital age will be performed by hybrid intelligence which combines human and artificial intelligence using complementary qualities that when joined boost each other. Companies not only need to enhance their level of AI while continuing to develop their human intelligence. Rather, they additionally need a higher order intelligence for transforming the two types of intelligence in line with cooperative strategy and business strategy. This dynamic transformation over time may not be achieved by relying on human and artificial intelligence.

Rather than independent management of multiple types of intelligence, hybrid intelligence can generate completely new solutions and business models. Specifically, this hybrid intelligence involves the renewal and recombination of different types of intelligence. Depending on the extent of renewal and recombination, there are four

transformations that will come up in figure 4 which are consistent with extent insights into the transformation of innovation processes and product features. So, these are, this is the, on the x axis we have recombination of intelligence that moves from low to high and on the y axis we have renewal of intelligence that again moves from low to high.

So when both these are low, it is incremental transformation. When this is high and this is low, it is architectural transformation. When both of them are high, that is radical transformation and when renewal of intelligence is high, while recombination of intelligence is low, it is modular transformation. Incremental transformation involves only a limited renewal of recombination of AI and HI. Examples are updates of AI technology to enable new functionalities or the selective implementation of a new creative technique to better leverage human idea generation and intelligence.

Now let us look at what is this incremental transformation. Incremental transformation involves only a limited renewal and recombination of AI and HI. Examples are updates of AI technology to enable new functionalities or the selective implementation of a new creativity technique to better leverage human idea generation and intelligence. Incremental transformation, both of these approaches could recently be observed in many large companies as diverse as Facebook and Harley Davidson. Modular transformation includes a significant renewal of intelligence, whereas the level of recombination is relatively limited. The intelligence architecture is largely untouched, but the individual intelligence types are substantially reconfigured.

With regard to HI, many companies such as Apple and the German software company SAP have strongly transformed their human-based innovation processes to focus on design thinking logic instead of the traditional innovation processes. This has often occurred quite independently from AI activities and the overall intelligence in architecture has only been affected to a limited degree. With regard to AI, the modular transformation also involves the substitution of one type of intelligence by the other. The transformation has received most public attention in recent years because many firms' strategic initiatives have focused on replacing HI by means of AI, which would deliver nearly identical work results.

The next is architectural transformation. It focuses on the recombination of the two types of intelligence, whereas the level of renewal is limited. This transformation has often been overlooked so far because most companies do not yet take an integrative perspective on their different types of intelligence. They rather have started somewhat isolated AI initiatives and they continue to nurture the HI of their experts. An example is an update of a firm's investment guidelines which make the consultation of existing AI a requirement before taking decisions.

This is what the investment management firms WorldQuant and Aspect Capital have done. The focus of architectural transformation is not on implementing completely new technology. Rather, the focus is on revising the independencies of AI and HI, thus changing the connections of technology that was already used at least in some parts of the company. The next is the radical transformation. Radical transformation involves high levels of both renewal and recombination. Consequently, a firm's intelligence is updated and enhanced while simultaneously changing the intelligence architecture.

An example here is the implementation of new and advanced data mining algorithm in a company's strategic planning process which would involve a close interaction with the HI of the strategy department. So, there are many new interdependencies of AI of HI with new AI technology which requires a substantial adaptation of a firm's intelligence architecture. Startup companies such as Telena use advanced data analytics to fill roles and pre-select candidates for open positions at their customers. The new technology determines whether candidates are invited to a personal interview and the final decision is based on the scoring of AI and experts from human resources department. So, in order to conclude this module, AI not only helps in attaining competitive advantage but strategically using AI can help build long-term and sustainable competitive advantage.

Machine learning models can learn to identify and recommend novel or emergent KPIs. AI-backed optimization and prioritization of KPI help achieve sustainable competitive advantage. Then, we have studied the integrated strategy machine which uses AI to create advantage. Artificial and human intelligence thrive at very different tasks. The majority of the work in the digital age will be performed by hybrid intelligence which combines human and artificial intelligence. And these are the several sources from which the material for this module was taken. Thank you.