

# Innovative ways of Customer-Focused Organizations using Artificial Intelligence (AI)

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**Abstract:** Artificial intelligence (AI) has been endorsed as a technology with innovative ways for customer-focused value chain organization. This paper has focused on the implementation of AI in manufacturing, logistics, marketing, and other value chain stages, and customer-focused organizations innovative plans to install the technology. The customer-based survey data show that actual utilization is low, particularly in industries where information technology (IT) does not core to the business. Hence, this paper reviewed on what companies are doing with AI and the types of industrial benefits they expect or have earned. Also, this paper deals on the how: How companies are designing using AI applications for their customer based value chains, how they have productively established using AI, how they have acquired data to train models, and how they have scaled or plan to scale the technology.

The review has to illuminate on the questions executives are asking themselves to determine where AI will deliver value to customer based organizations. The study extends, while adoption and investment vary across industries, there is potential for AI to improve many functions, including product design, manufacturing, delivery, retail, and marketing. How companies deploy AI solutions involves defining a clear strategy around a business problem or opportunity in the value chain, determining an approach to developing AI solutions, cultivating data and human capital, and carefully managing the many risks AI can pose. The based on case studies of six companies with varied backgrounds; Innovative ways of Customer-Focused Organization using Artificial Intelligence.

By ensuring that customer-based value creation is the “North Star” throughout the process, companies can slowly leverage AI as a tool to generate efficiency, product/process improvement, and even product/process innovation. This paper shares information of how AI can improve various stages in the customer-focused value chain organization provides insight on how to design business strategies that leverage AI to create value, and raises important questions about the implications of Innovative ways of Customer-Focused Organization using Artificial Intelligence.

**Key Words:** Artificial Intelligence (AI), Machine learning (ML), Customer Focused Organization, Enterprise, and Consumer, Startups, Cultivating Data, and Human Capitals.

## 1. INTRODUCTION:

Though artificial intelligence (AI) has been a research focus for over fifty years, only in the last decade has it become popular for enterprise and consumer use. Falling costs for back-end technologies and capital investments from major brands have allowed for AI to prove itself successful in a variety of use cases and the efficiency and accuracy of the technology continue to garner attention from researchers and business leaders alike.

Alongside bigger institutions, startups have focused their efforts toward perfecting AI applications for both general-purpose and narrow solutions. Investors have dedicated significant capital to the development of these technologies, and consumers are becoming attuned to a more automated world for content discovery, self-driving cars and more. Ultimately, this leads to each consumer being treated as an audience of one regardless of where they go because their experiences will be highly personalized. To better understand developments in the AI space, we interviewed over 50 successful entrepreneurs, executives, and academics leading the charge on new technologies and applications. We developed 5 bold projections that showcase how AI will impact the consumer experience in the coming years. Of course, not all these projections may become a reality, but AT&T Foundry certainly intends to do its part in fostering innovation in the AI ecosystem [1].

There is much hype around autonomous vehicles, as consumers look toward a future where cars and trucks drive themselves. While full automation of transportation is many years away, car companies such as NIO are working toward high automation, where a car can use artificial intelligence (AI) to operate without human input or oversight but only under select conditions. NIO imagines transforming the notion of a car into a robot in which the driver manages driving on surface streets and then becomes a passenger as the car enters a highway. NIO’s in-car, AI-driven virtual assistant NOMI would manage the passenger’s needs for shopping, entertainment, and more, giving the passenger his/her time

back. Padmasree Warrior, U.S. CEO and Chief Development Officer, NIO, says this freedom would allow the passenger to be more “productive, playful, and peaceful”. One can imagine that this type of highly autonomous car of the future could lead to the rise of new business models in which cars become extended living rooms where people engage in various activities and purchase new products and services that haven’t yet been imagined [2]. Fig.1 shows the model of a customer-focused organization.



Fig.1 Model of Customer-Focused Organization

As seen through the NIO example, advancements in artificial intelligence and machine learning have the potential to transform the management and structure of global value chains. New technologies in critical areas such as natural language processing, sensors, robotics, edge computing, machine, and deep learning, and image recognition provide significant opportunities to improve how products and services are designed, made, delivered, marketed, and used. Industry applications include targeted marketing, dynamic pricing, product design, manufacturing automation, and supply chain coordination.

Still, it is difficult to distinguish between fact and fiction when it comes to the promise of AI. Companies are reporting significant optimism about the potential for AI to transform their businesses. According to a recent survey of over 3,000 business leaders by MIT Sloan Management Review and Boston Consulting Group, 85 percent of companies believe AI will allow them to sustain their competitive advantage. Companies also expect to achieve increased revenues and decreased costs by deploying AI technologies. Yet, adoption rates have not kept pace with industry enthusiasm. The MIT/BCG survey found that only 23 percent of companies have adopted an AI technology while only 5 percent of companies have extensively adopted AI. When new AI technologies have been adopted, they have been primarily used in support functions such as customer service rather than in core functions. The customer-focused organization using AI is shown in Fig. 2.

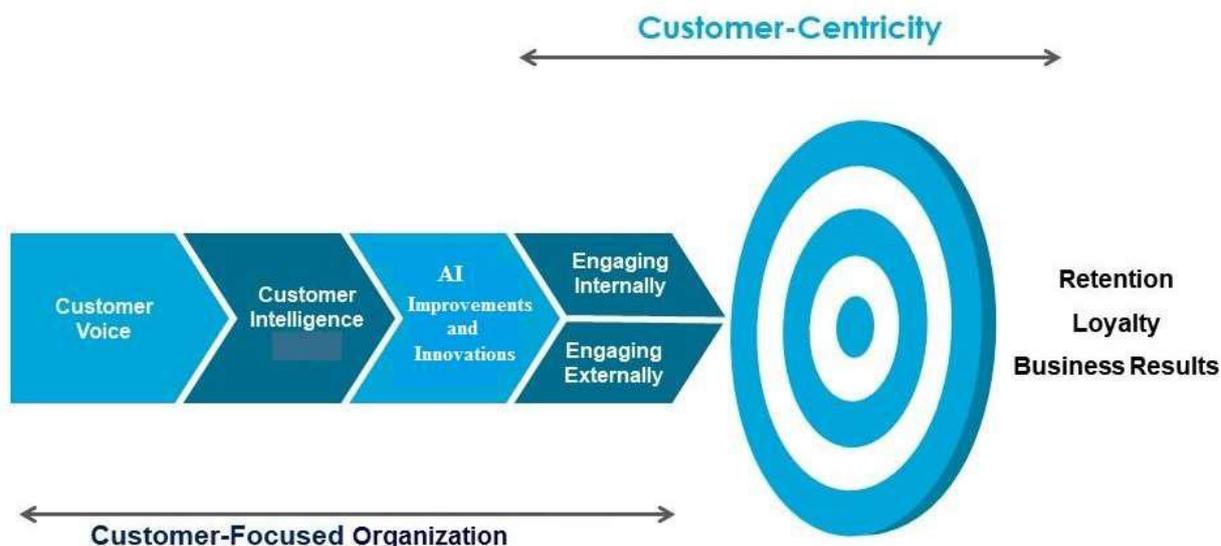


Fig.2 Customer-Focused Organization using AI

The slow pace of adoption in value chain phases such as design, manufacturing, delivery, and use is a reflection of numerous barriers. According to executives, AI adoption is most often prevented by a lack of information technology infrastructure, talent, proven technologies, and financial resources. AI experts also report data collection and preparation as significant challenges. If the required data is not collected, disaggregated, or appropriately formatted, AI models cannot be built in the first place.

Looking ahead, AI presents organizations not only with real challenges, but also with exciting opportunities to refine marketing and pricing techniques, improve product design, production automation, supply chain coordination, and more. In this paper, we will review key AI technologies, discuss notable applications and benefits of these technologies in various phases of the value chain, and discuss their implications. Finally, we will present case studies to explore how value is being generated by AI-driven innovations. We examine companies' approaches to data acquisition, human talent management, and potential effects across the value chain. Case study participants include Adobe, Salesforce, Pilot AI, IBM, OhmConnect, and Stitch Fix—a mix of solution providers and users, and small and more mature firms from varied industries. Unless otherwise noted, the findings from these companies come from one-on-one interviews [3].

## 2. Development of Artificial Intelligence:

Artificial intelligence is the development and use of computers to perform tasks that traditionally require human intelligence, such as visual perception, speech recognition, and language translation. With AI, computers learn from data sets to understand underlying data structures and uncover procedures to make the correct use of the data.

As described in Andreesen Horowitz's AI playbook<sup>1</sup>, it's useful to understand AI in terms of a combination of goals and techniques. AI's goals can include recognizing what's in a picture, converting voice into typewritten words, or planning a route. The techniques AI uses to achieve these goals can vary greatly, and include terms like deep learning and supervised learning [4].

A crucial differentiation is between AGI (artificial general intelligence) and machine learning. AGI refers to machines generally being able to carry out tasks typically performed by humans. Machine learning refers to all techniques that allow computers to "learn without being explicitly" programmed. A particular application of machine learning is deep learning, which allows for a computer to recognize patterns from both labeled and unlabeled datasets. However, AI is broader than machine learning or its subset, deep learning. Other AI techniques include search, symbolic reasoning, logical reasoning and statistical techniques that aren't explicitly deep learning-based. A truly comprehensive AI makes use of all techniques available, though the enterprise landscape is heavily focused on machine learning at the moment.

There is no standard definition of AI, and experts even disagree on the right criteria to determine whether a technology should be considered AI. This is primarily because the relevant criteria keep evolving as machines succeed in increasingly complex tasks. Consider a prominent example: playing the television show game Jeopardy was considered too difficult for AI until IBM's solution known as Watson beat human challengers.

Without a concrete definition, it is often difficult to discern between real AI technologies and the growing AI hype. We use the following broad rule of thumb: AI can be considered any form of machine learning. Machine learning includes a wide range of models that can be trained based on data, learning its own rules instead of receiving the rules from humans. These models are used by machines to complete tasks, often making predictions, based on new data [5]. Machine learning (ML) can take several forms. Two growing areas of machine learning include deep learning and reinforcement learning. Deep learning, which uses complex multi-layered models to make predictions, is inspired by the firing neurons in the human brain. Deep learning is well-suited for recognizing patterns in images, text, and sounds and is behind state-of-the-art technologies for image classification and natural language processing tasks. Reinforcement learning uses prediction models that are continuously retrained based on collecting and analyzing new large data sets. This retraining is based on improving the performance based on a reward function. For example, in the context of playing chess, reinforcement learning would train models to pick the optimal move, play millions of games of chess to generate data, and track its performance versus a reward function of winning each game.

### 2.1 Improvement of current Artificial Intelligence

The market for AI has grown tremendously in the last couple of years. Right now, approximately 1,500 companies in North America are developing AI applications including leading companies such as Microsoft, IBM, Google, and Amazon. This number is only expected to grow as institutions embrace AI's ability to increase productivity through intelligent automation, labor and capital augmentation, and innovation diffusion through AI partnerships. Experts also forecast that annual global revenue from AI products and services will grow from \$643.7 million to as high as \$36.5 - \$100 billion by 2025 [6].

With the promise of revenue, investors have become keen on AI space as well. Leading the charge in the AI investment space are companies like Data Collective, Intel Capital, Khosla Ventures, New Enterprise Associates, and

Google Ventures. Consistent investments from these leaders, alongside other market participants, have caused global AI funding to increase from \$95 million to over \$1 billion. Last year, more than \$5 billion was invested in 658 companies - a 61% increase.

Like revenue, additional research predicts that investment in AI will grow 300%. The growth of market participants, funding and projected revenue all signal the tremendous impact AI will have on our day-to-day lives over the next few years.

## 2.2 Current State of AI Adoption in Value Chains

Companies are experimenting with and adopting AI technologies across their value chains. Most of their efforts have been invested in non-core support functions. In one survey of 3,000 professionals, over 25 percent of respondents reported having adopted AI in each of the following support functions: IT, customer service, marketing, sales, finance, and accounting. However, in contrast to how other new digital technologies have entered the enterprise, companies are also investing in AI for core functions. For example, Stitch Fix, a personal styling service, an e-commerce company, deploys deep learning to understand a user's clothing style based on styles they like on Pinterest and also deploys machine learning to match stylists with users.

As to be expected, the role AI plays in value chains today varies by industry. We can contrast the high tech and telecom industry and the construction industry as one example. Over 30 percent of high tech and telecom companies have implemented at least one AI technology, whereas only 15 percent of construction companies have pursued such advancements. High tech and telecom companies are more likely to focus on using AI to improve their information technology while construction companies focus on using AI to improve operations and manufacturing, reflecting each industry's focus [7].

Going forward, there is a risk that differing rates of adoption could widen the AI gap between technology-focused industries and other industries. Over the next three years, AI spending at high tech and telecom companies is expected to grow over ten times faster than spending at construction companies. While this is a significant difference, at a recent Stanford conference on AI, Jim Sinai, VP of Product Marketing for Salesforce Einstein, remarked that because of the very fact that traditional industries such as manufacturing, retail, and healthcare have legacy systems, certain types of AI can be deployed relatively quickly and add value. Therefore, while technology-centric industries may be investing in AI more heavily than other industries, opportunities still exist for a strong return on investment for targeted applications in more traditional industries.

One example of an industry that is in the middle range of AI adoption and investment growth in retail. Two of our case study companies are involved in retail Stitch Fix, which uses AI for functions like marketing, product design, and stylist-customer matching, and Pilot AI, which sells visual recognition software for cameras used to track customer behavior in retail stores as one of its applications. Both are examples of how new technology can be applied to the more traditional industry. Overall, AI is increasingly being used by retailers to recommend products, monitor face and hand gestures, employ virtual mirrors to track shoppers' movements, and for overall surveillance.

The automotive and energy industries have seen high AI adoption rates, with moderate projected investment growth. Padmasree Warrior of NIO U.S. believes that newer car companies are at an advantage concerning AI technologies because they are not faced with transforming combustion engine-centric engineering culture a challenge at more mature car companies. She believes the biggest opportunities for innovation in the car industry are for electric and autonomous vehicles, both of which are a focus for NIO. One of our case studies focuses on OhmConnect, a clean energy solutions provider. Since the company is not an energy generator with heavy assets, it can more easily adopt AI solutions.

High tech is one of the highest adoption sectors, and we have three case studies focused on such firms: Adobe, Salesforce, and IBM. These companies offer many software-based solutions, making it easier to evolve their AI technology over time. While AI solutions may be easier to develop for such asset-light companies, other challenges such as change management may exist in even the most technology-forward firms. Adoption rates may also be influenced by varying industry regulatory structures [3].

According to Tatiana Mejia, Head of AI Product Marketing and Strategy at Adobe, it is more challenging to deploy their AI software solutions for professionals in industries such as financial technology and healthcare due to heavy regulation, which may explain the moderate AI adoption in the healthcare sector.

## 3. Development along the Value Chain:

A value chain is structured around understanding customer demand and then supplying that demand. Efforts to deploy deep learning and machine learning technologies have begun to improve demand-and-supply management in many industries. Fig. 3 shows the customer feedback strategy on how various AI technologies have improved key value chain functions. We will focus on how AI is generating value in each of the following key phases: design, source and make, deliver and store, sell, and use. Note that, while "source" and "make" are distinct activities, as are "sell" and

“use,” these stages have been condensed for the sake of simplicity. We will use case study examples to demonstrate how AI can be used to improve one or more value chain phases. Because AI is increasingly being deployed beyond support functions into core business processes, we have placed greater emphasis on these core functions rather than areas such as back-end IT support.

Customer feedback has an important role in successful product and service design. In industries with strong digital relationships with their customers, feedback gained from e-commerce interactions, digital marketing campaigns, and other means can be valuable in understanding how to improve the product. Stitch Fix is a personal-styling-platform company that curates a personalized box of clothing to be delivered to customers, who then choose which items to purchase or return. The company has used AI to predict which clothing items customers will like and purchase and to match stylists with customers [8].



Fig.3 Customer Feedback Strategy

After seeing gaps in inventory and a need for better clothing choices, Stitch Fix made a strategic decision to begin designing its clothes to complement its existing inventory. The company now uses AI to identify popular clothing features and recommend new combinations of those features to Stitch Fix’s in-house design team. This approach has led to 100 Hybrid Designs-branded products thus far. Data sources include objective data on color, pattern, etc., and subjective data such as style. Computer vision is used to analyze photos to extract additional data. From a human talent perspective, the company prides itself on using human-in-the-loop AI, where people receive input from AI models but make the final decision. For design creation, this means AI recommends potential designs, and designers edit the styles or discard them entirely. The company has a chief algorithms officer who reports directly to the CEO, highlighting the importance of data science to the company. Still, there exists a balance between data scientists and those with retail backgrounds who can do the more subjective analysis of styles [7].

#### 4. Implementation of Source:

IBM is a technology company providing software, hardware, cloud services, and cognitive computing to clients all over the world. Watson is IBM’s AI platform, helping companies with business insights across a wide range of industries and use cases (e.g., talent acquisition, supply chain, customer engagement). In IBM's supply chain, Watson is now assisting in nearly every process. For example, a supply assurance manager can ask: "What are the top five components with the risk of supply shortage?" and "Should we pull more of that specific part or bring it over from another site's inventory to mitigate the supply risk?" AI is enabling IBM to have end-to-end visibility and insights from data across systems. The company is on a journey to predict, assess and mitigate disruptions and risks, and enable a smart, resilient, and agile supply chain.

Today's supply chains have access to internal, external, structured, and unstructured data. Supply chain professionals need real-time contextual insights to predict risks and disruptions and take action. Matthias Graefe, IBM's Director of Digital Supply Chain Transformation, reports that Watson is now trained to provide insights in real-time. This motivates professionals to interact with the platform and share with Watson the decisions they are taking and why. For example, Watson learned how to identify product changes shared by the development teams with the supply chain team via complex electronic documents. Watson identified parts that were becoming obsolete in a couple of weeks and advised planners to procure new parts. The assistant was trained within weeks based on around 300 annotated sample documents, identifying parts relationships that had not been previously known [9].

The number of sample documents needed to train the system can be much lower if the data is more structured. IBM now has a commercial Watson Supply Chain business unit, and Graefe's team is accelerating the rate at which Watson learns and provides deep supply chain insights. Transitioning to AI-enabled supply chain processes have yielded important lessons on human-machine interaction. Initially, users did not pay enough attention to the recommendations provided via a conversation panel. Then graphical information was coupled with the advice. With the relevant information linked to the question and answer, users could form their assessment and decide whether or not to overrule Watson. Watson observes user decisions, learns from feedback, and provides playbooks on how to handle issues. It has started to prompt employees to look at likely follow-up questions, acting as a moderator in resolution processes. Graefe envisions a future in which Watson will be a personalized advisor that learns from increasingly digitized data, interacts with users to clarify its understanding, and then engages in exponential learning [10].

## 5. CONCLUSION:

We have observed examples of AI improving precision and speed in many value chain phases such as marketing, customer insights, design, manufacturing, delivery, and retail. By improving the precision and speed of these functions, we find that the following key improvements are possible.

- ❖ Process efficiency: AI automation often improves repetitive processes that are not enjoyable or challenging for humans. For example, Abundant Robotics has designed AI-powered automated machines to harvest apples, reducing the amount of labor needed. Since manual apple picking is physically demanding and labor supply is low, farms have an incentive to improve this process.
- ❖ Process enhancement: AI can also enhance existing processes, leading to better outcomes for users. For example, Salesforce Einstein can prioritize leads for a salesperson and hide those that have a very low likelihood of converting to a sale. This enhances the sales process, allowing executives to devote high-quality time to high-value leads.
- ❖ Product or service innovation: AI can enable the creation of new products and services. As seen with Stitch Fix, AI can power new product design, using data from multiple sources to predict styles that will resonate with customers.

## REFERENCES:

1. "AT&T Network 3.0 Indigo Redefining Connectivity through Software Control, Big Data and Blazing Speed." Att.com. 1 Feb. 2017
2. Allana Akhtar, "Google's DeepMind to use AI in diagnosing eye disease," USA Today, July 6, 2016. Accessed July 6, 2016. <http://www.usatoday.com/story/tech/news/2016/07/05/google-deepmind-artificialintelligence-ai-eye-disease-london-go-diabetes/86722906/>
3. Blair Hanley Frank, ISG, "Salesforce Einstein Now Powers Over 1 Billion AI Predictions Per Day," *Venture Beat*, February 28, 2018.
4. Economist, "Million-dollar babies," April 2, 2016. Accessed July 25, 2016. <http://www.economist.com/news/business/21695908-silicon-valley-fights-talent-universities-struggle-hold-their>
5. Etherington, Darrell. "Elon Musk's Neuralink wants to boost the brain to keep up with AI." Techcrunch.com. 27 Mar. 2017.
6. Geoffrey Smith, "Here's why Toyota is spending \$1 billion on AI in Silicon Valley," *Fortune*, Nov. 6, 2015. Accessed July 7, 2016. <http://fortune.com/2015/11/06/toyota-ai-silicon-valley-robotics/>
7. Kim S. Nash, "Q&A: Target CEO Brian Cornell Says Tech is 'Thread that Connects All Initiatives,'" *The Wall Street Journal*, July 8, 2016. Accessed July 8, 2016. <http://blogs.wsj.com/cio/2016/07/08/qa-target-ceobrian-cornell-says-tech-is-thread-that-connects-all-initiatives/>
8. Michael Rapoport, "Auditing Firms Count on Technology for Backup," *The Wall Street Journal*, March 7, 2016. [http://www.wsj.com/article\\_email/auditing-firms-count-on-technology-for-backup-1457398380-1MyQjAxMTA2NzAzODkwNjg0Wj](http://www.wsj.com/article_email/auditing-firms-count-on-technology-for-backup-1457398380-1MyQjAxMTA2NzAzODkwNjg0Wj) Article accessed March 8, 2016.
9. Toyota revenue according to a Toyota press release on May 11, 2016. Accessed July 7, 2016. <https://corporate.news.pressroom.toyota.com/releases/toyota-april-march-2016-financial-results.htm>
10. Woollaston, Victoria. "Following the failure of Tay, Microsoft is back with new chatbot Zo." *Wired.co.uk*. 6 Dec. 2017.