# Artificial Intelligence and Improving the Customer Experience

**A PEGA WHITEPAPER**

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# Contents

# Introduction

The term "artificial intelligence" (AI) is seeing a dramatic resurgence, leading to both potential confusion and powerful ways to use it for customer engagement. In fact, AI has been around for many years, in many forms. Yet only in the past decade has the door truly opened up to its practical application – a change fueled by the new abundance of data to power decisions as well as ever-increasing customer expectations.
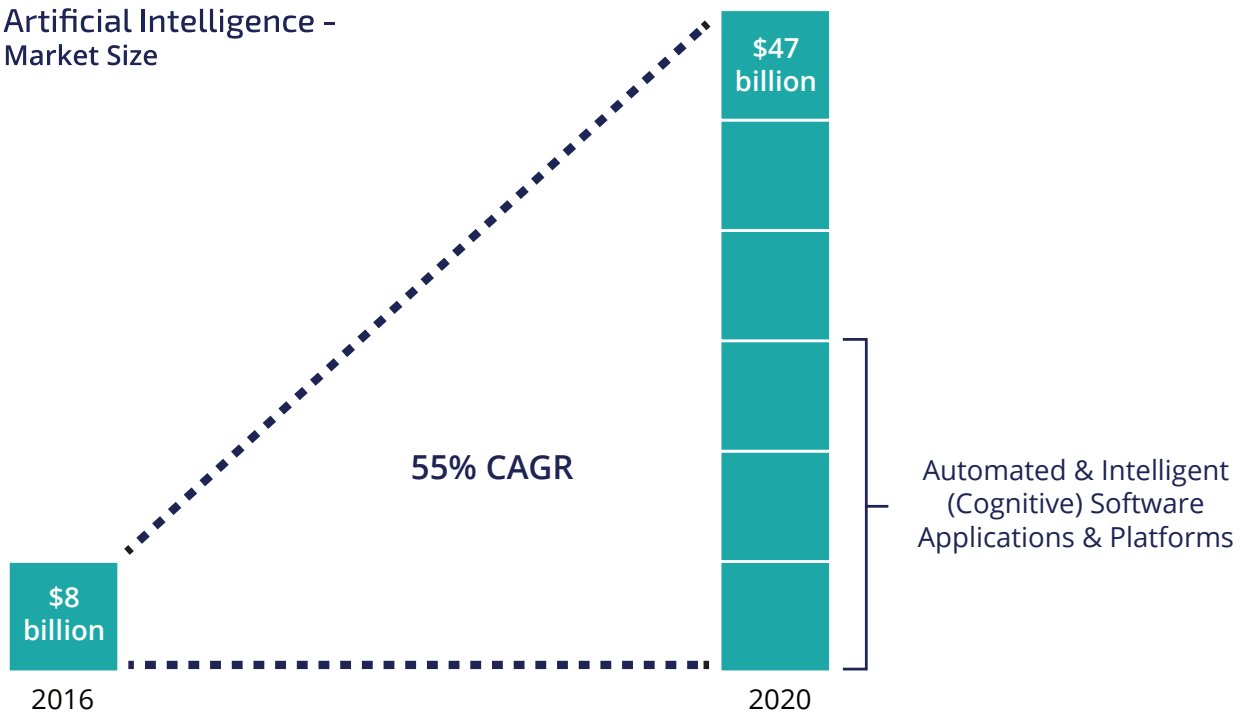
Brands that are in the business of improving customer experience for their clients now need to cut through the hype and hyperbole. Organizations must figure out what matters and where they can safely place their bets for real results.

No matter how you define AI, it is here to stay, and will only become more pervasive. From smarter phones to smarter dwellings to plotting our daily actions, AI offers the collective promise and reality of automation and intelligence from technology. The potential impact on our personal and work lives is massive. According to IDC (and depicted in Figure 1), "Widespread adoption of cognitive systems and artificial intelligence (AI) across a broad range of industries will drive worldwide revenues from nearly $8.0 billion in 2016 to more than $47 billion in 2020."[i]

**The market for cognitive / AI solutions will experience a compound annual growth rate (CAGR) of 55.1% over the 2016-2020 forecast period.[i]**

Figure 1:

## Artificial Intelligence – Market Size



$47 billion

55% CAGR

$8 billion

Automated & Intelligent (Cognitive) Software Applications & Platforms

2016

2020

What's clear is the opportunities are immense, if only businesses can harness their power.

# The AI Imperative: Practical Application

While it's important for brands to understand what AI is in order to have some sense of its purpose and potential, it's more important to have a clear understanding of how your business wants to engage its customers. This requires an honest appraisal of your current engagement model and a pragmatic view into where it must move both near and long-term.

For example, are marketing treatments highly personalized to the individual, or simply blasted out to customer segments? Are salespeople empowered with insights about their accounts and contacts that they wouldn't otherwise know, or are they forced to enter data into a tracking system that gives them nothing in return? Are customer support agents equipped with guiding intelligence to help them delight customers during every interaction, or are they bombarded with data that they need to interpret on their own?

The evidence suggests that many organizations have yet to deliver on these simple AI use cases. A study by Bain & Co found that 80% of CEOs believed they were delivering a superior customer experience, yet only 8% of their customers agreed.[ii] Moreover, when marketing executives were asked in a recent survey how well their organizations fulfilled promises they made to customers, only 16% said they performed optimally.

Assuming your business may be among the other 84%, you need to first envision how to transform your customer experience, declare that as your destination, and put a reasonable time horizon on getting there. Indeed, most businesses today plan very few aspects for their business beyond three years, as market and customer dynamics alike simply move too fast. This is why businesses are now increasingly adopting practical AI blueprints that they can realize in two to three years, and start getting value from in just a few months.

To achieve this, you must first envision a set of smarter, more proactive and personalized engagements with your customers. These new interactions must be achievable and made to deliver measurable value quickly. For example, a bank may wish to anticipate banking needs their customers will have within the next six months and then proactively present options to them, even before the customer may be aware of their needs. The bank might use AI to achieve this vision in the following ways:

- A parent may not realize that now is the time to start planning and saving for their child's college education and their own retirement, but using AI, the bank can sense that need and help that individual.

- Some customers unfortunately don't pay their bills, putting them at risk for defaulting or even going bankrupt. The bank can use the power of AI to predict which customers are likely to become delinquent, and preemptively execute tactics that steer them toward payment and solvency.

- A baby boomer with a complicated financial situation may not have executed five critical documents for an estate plan, but the bank can detect this speed bump in the customer's journey and engage them with these services, adding real value and utility.

Use cases for delivering value along a customer's journey abound. However, real experience-wide adoption only comes when consumers themselves are open to these techniques. Recent research shares that there is good news in this respect:

**In a recent Pega survey of 6000 adults, only 28% said they were uncomfortable with a business using AI to improve interactions.[iii]**

Businesses that sense these experience gaps and present relevant recommendations related to those needs will get the consumer's attention. Those that just spew random offers, proving they know nothing about their customers, will quickly turn them away.

AI technology using smart data sources can help you understand where each customer is in their unique journey, and then tailor to their situation. Lay out these use cases, and bake these into your AI plans.

## Think Big, Start Small

You may be tempted to use AI to solve dozens or even hundreds of problems right away. However, the businesses that drive the fastest and best results focus on tackling the issues that will have the greatest impact on customer experience. They strategically select forms of AI to make their products and services smarter, faster, and easier to buy and use.

To follow this best practice, identify the low-hanging fruit – the higher-impact, lower-effort, less invasive opportunities to transform your brand for optimal customer engagement. For example, you could:

- Reduce mundane customer service tasks using automation technologies, like chatbots or robotic automation, to free up customers from the shackles of wait times, which at the same time frees your client-facing employees to handle higher-order work.

- Predict which accounts and contacts are most likely to influence and buy, allowing salespeople to focus on the right opportunities.

- Present relevant promotions to customers based on their individual needs rather than the needs of the business, driving higher conversion rates and better customer satisfaction.

For the fastest and best results, focus on tackling the issues that will have the greatest impact on customer experience.

Remember: AI isn't some magical technology that's coming in a future release. It's here now. Practical application of *real AI* today pays huge dividends. Economic impact studies commissioned by major technology providers demonstrate that it's not only possible but also highly likely, you could attain:

≈ **300% to 600% increase in customer response rates**

≈ **10% to 50% reduction in customer churn**

≈ **Net Promoter Score (NPS) increases from 10 to 40 points**

≈ **300% to 500% Return on Investment (ROI)**

In fact, a recent Forrester TEI study[iv] showed that a company using Pega's AI-infused customer engagement applications achieved:

AI isn't some magical technology that's coming... it's here now.

Figure 2:
Financial Summary Showing Three-Year Risk-Adjusted Results

| **ROI:** **438%** | **NPV:** **$ 138 million** | **Payback:** **4.7 months** | **Improved retention $139 million** |
|---|---|---|---|

Source: Forrester Research, Inc.

Sprint, one of the USA's largest mobile carriers, was able to achieve a 10% reduction in mobile subscriber churn using Pega's real-time AI. That system was up and running in just 13 weeks. Using an agile approach and a *quick win* mentality, results can happen in months, not years.

# Focus on Results First

For buyers, AI has become an increasingly confusing technical landscape, with terms such as machine learning (ML), chat bots, virtual assistants, robotics, natural language processing (NLP), deep learning (DNN/RNN), supervised learning, image recognition, text analytics, reinforced learning, complex event processing (CEP), and more seemingly emerging every day.

All you need to know is that each of these technologies is a building block for solving meaningful use cases, and each ultimately helps you accomplish some task. Figure 3 provides an illustration of these building blocks and their relationship to specific outcomes. These approaches are grouped to make sense of the many AI technologies that help businesses automate burdensome and repetitive tasks that humans can't do, can't do well, or can't do very fast. The upper portion (the Automation layer) contains functions that mainly mechanize things. The lower layer is where the true advanced intelligence rests, in the forms of predictions and forecasts – higher-level cognition.

To meet your business goals, you need to see the big picture. Instead of spending energy on mapping capabilities, work backward from outcomes. For example, your business might require:

- More loyal customers.
- Who will promote their great experience to others.
- And who will continue to buy from you because you offer great products and are easy to do business with.
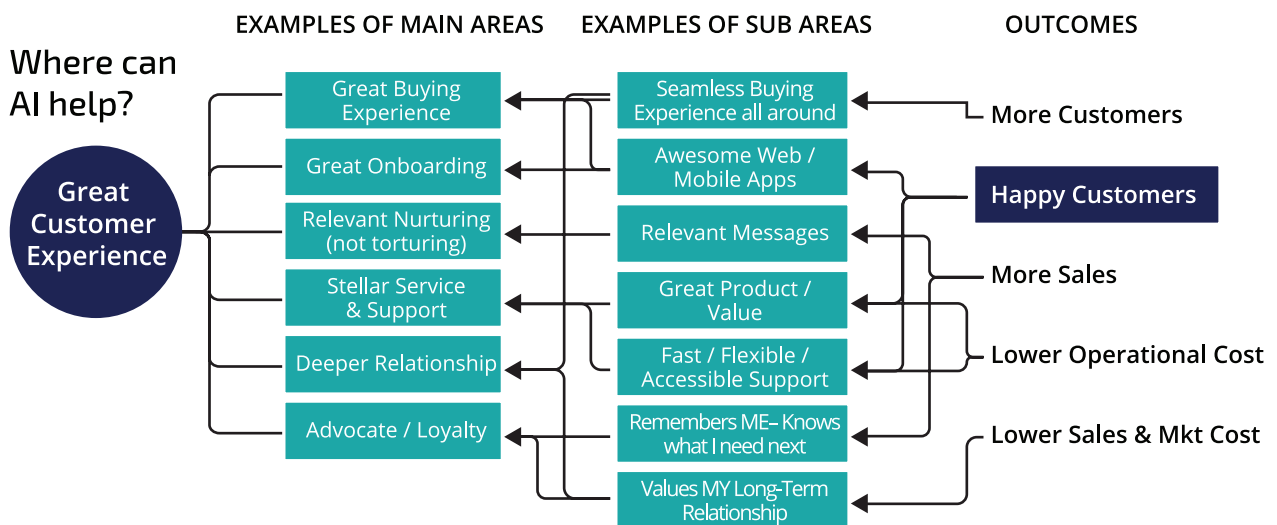
Figure 3:
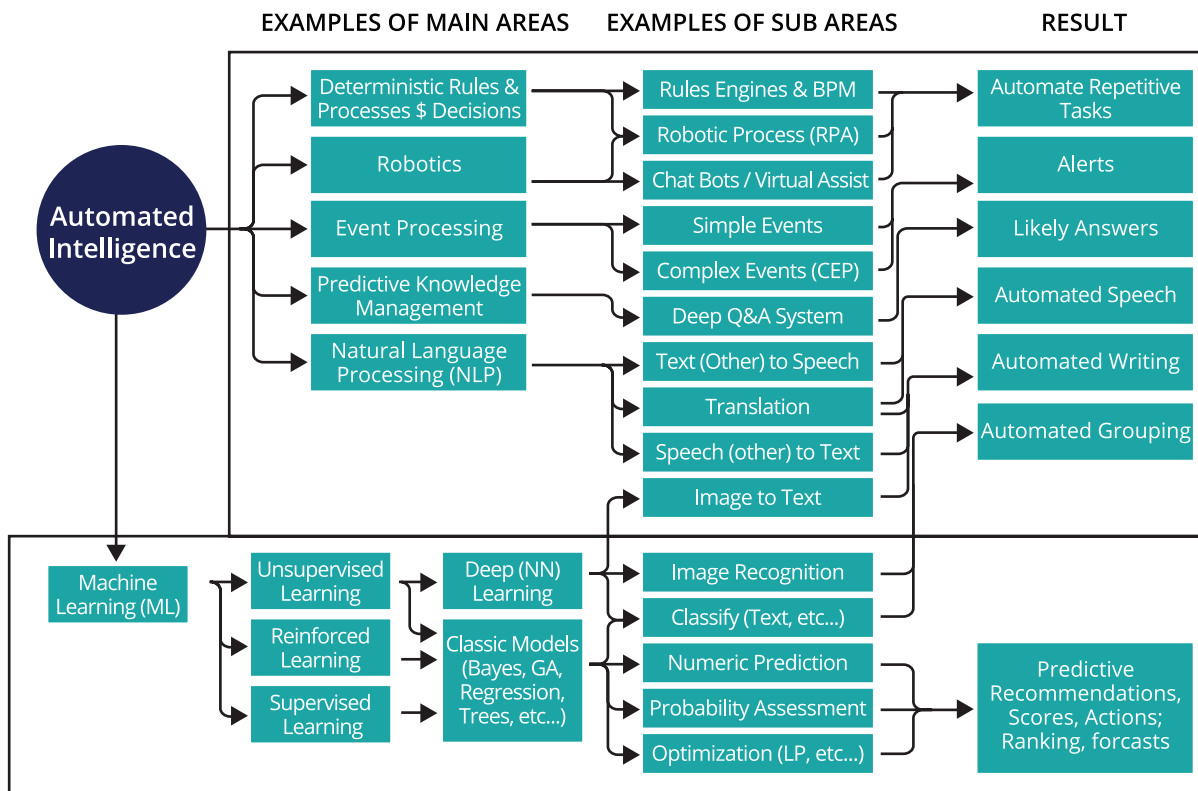
Yet chances are high you aren't firing on all of those cylinders. To start, identify your biggest challenge, and then work backward from the areas you need to address to improve the customer experience. For example, assume your greatest problem isn't acquiring customers, but keeping current customers happy.

Figure 4, read from right to left, shows how to work backward from your desired outcome. Since the issue is customer satisfaction, your focus should be upon:

- Improving the web / mobile app experience.
- Improving the support experience.
- Making sure each customer is getting a commensurate value for the product or service they purchase.

Figure 4:



**Where can AI help?**

EXAMPLES OF MAIN AREAS | EXAMPLES OF SUB AREAS | OUTCOMES

Great Customer Experience

- Great Buying Experience
- Great Onboarding
- Relevant Nurturing (not torturing)
- Stellar Service & Support
- Deeper Relationship
- Advocate / Loyalty

Sub areas:
- Seamless Buying Experience all around
- Awesome Web / Mobile Apps
- Relevant Messages
- Great Product / Value
- Fast / Flexible / Accessible Support
- Remembers ME– Knows what I need next
- Values MY Long-Term Relationship

Outcomes:
- More Customers
- Happy Customers
- More Sales
- Lower Operational Cost
- Lower Sales & Mkt Cost

**Machine learning (ML):** Computer programs that can improve performance (learn) when given feedback without being explicitly reprogramed.

**Chat bots:** An interactive computer-messaging program that conducts a conversation via an auditory or textual interface, designed to simulate how a human would behave as a conversational partner, able to exchange pleasantries, answer questions, and offer other means of assistance.

**Virtual assistants:** A software agent that can perform tasks or services for an individual, such as sending an email or scheduling an appointment.

**Robotic process automation (RPA):** Software that allows a company to record repeatable processes in an existing application, that otherwise would require human input, such as via a keyboard or mouse, and then trigger automatic execution when required, By doing so, these programs can automatically  process a transaction, input and manipulate data, trigger responses, and interface with other applications.

**Natural language processing (NLP):** The ability of a computer program to record, classify, interpret, translate, and glean insights from human speech as it is spoken.

**Deep learning:** A branch of machine learning that uses layers of neural networks (mimicking the design of the human brain) where outputs of one layer become the inputs of the next layer.  These neural models have proven very good at nebulous classification tasks such as image recognition.

**Supervised learning:** A type of machine learning where a teacher provides the model with a training data set, which it uses to formulate its algorithm, and then once the model is put into practice, it refines its prediction or classification via additional supervision.

**Image recognition:** The ability of software to identify objects, places, people, writing, actions, and so forth, in a digital image or video.

**Text analytics** - The ability of a computer program to classify, interpret, translate, and glean insights from structured or unstructured text data from any source.

**Reinforced learning:** A type of machine learning where an operator provides the model with a performance goal and ongoing feedback via rewards as to whether there is progress toward goal achievement, but no other explicit instructions on the behavior expected to meet the goal. As such, the model experiments with behaviors, and learns which are superior based on the reward system.

**Complex event processing (CEP):** Software that takes multiple inputs (signals) and tracks whether an activity pattern has been satisfied or not, based on an accounting of signals and pattern formulation.  For example, a credit card firm may use a CEP system to detect fraudulent behavior by monitoring what it deems to be unusual patterns of credit card use behavior.

Work back from business outcomes to identify your greatest challenge, and opportunity, for positively impacting customer experience.
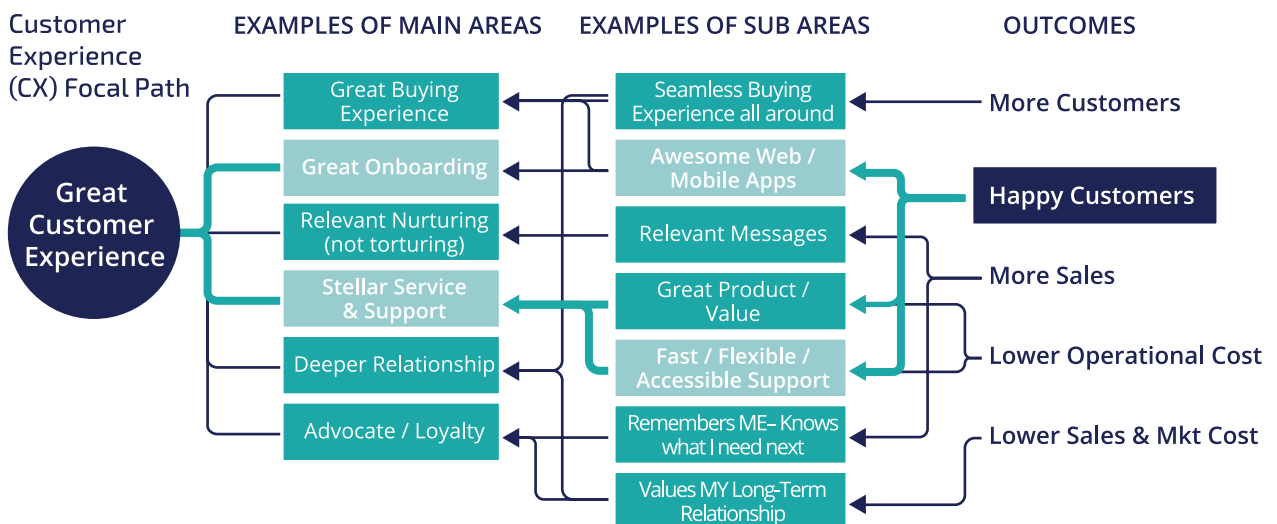
Pega designed this framework as a template that your business can leverage for your AI aspirations. As you go through this exercise, ask yourself how your business could infuse more proactive intelligence into any crucial area.

In fact, by using AI you may get a "double positive" effect. For instance, if you decide that improving customer satisfaction is your biggest priority, then one important step could be using AI to introduce an effective chatbot experience (because you know your customers have asked for 24/7 support with limited friction). As you do so,

you improve support and raise customer satisfaction while simultaneously lowering operating costs.

Your bot would then go through various stages of evolution. At first, its main job may be to keep valuable agent time from being wasted by answering simple questions. Eventually, its functional intelligence may increase until it's capable of taking some rather nebulous issue statements and effectively routing to the right people who can most efficiently resolve the problem.

Figure 5:



Customer Experience (CX) Focal Path

EXAMPLES OF MAIN AREAS | EXAMPLES OF SUB AREAS | OUTCOMES

Great Customer Experience

- Great Buying Experience
- Great Onboarding
- Relevant Nurturing (not torturing)
- Stellar Service & Support
- Deeper Relationship
- Advocate / Loyalty

- Seamless Buying Experience all around
- Awesome Web / Mobile Apps
- Relevant Messages
- Great Product / Value
- Fast / Flexible / Accessible Support
- Remembers ME– Knows what I need next
- Values MY Long-Term Relationship

- More Customers
- Happy Customers
- More Sales
- Lower Operational Cost
- Lower Sales & Mkt Cost

## Why Your Data Matters

Anyone who's taken a computer-programming course has heard the phrase, "garbage in, garbage out." AI systems are no different. They use data as fuel – and if it's incomplete, tainted, inaccurate, or biased, then low octane levels will lead to a sluggish, underperforming AI.

However, many things have changed since that programming idiom arose. Systems source massive datasets in various formats at blazing speed; cleansing routines can root out errors, fill missing fields, cross-correlate sources, and append new, related data.

Of course, high quantities of unstructured, raw data can sometimes lead to slower processing. As a result, organizations still find themselves wrangling massive amounts of raw data and struggling to make it usable and accessible.

In order to implement an effective customer engagement solution, AI must have memory banks full of great information. Designers have the opportunity to wire in information coming from raw data pertaining to customer behavior, profiles, device type and usage, and much more.

As you navigate your customer experience (CX) focal path, take stock of the data each area should provide, and then crosscheck with the data you have. Run simple tests to gauge the effort to source the data, feed it into an AI CX pilot, and keep a running tab of the issues you encounter. This list becomes your inventory of data projects you'll need to complete to ensure your AI CX effort won't choke due to lack of proper fuel.

You also need to pressure test whether these existing data management systems can hold up under the new load of AI. Also, don't forget that for most organizations, small data – the CRM information you have on your customers, your transaction systems, and your product catalog – remains an untapped resource. You can start improving customer retention using machine learning algorithms with small data (e.g., a 50-field data set). Don't get hung up on solving your big data problems before you start tackling real business solutions.

In order to implement an effective customer engagement solution, an AI must have memory banks full of great information.

# Defining the Rules of the Game

AI as an entity evolves only when it can sense, remember, take some action, and learn from the results, in a continuous cycle as shown in Figure 6. In order for it to be a fully functioning and orderly system, it must include a decision-making layer, which contains institutional memory and processing steps. In fact, according to a Forbes article citing Forrester research, the single most valuable use of AI for organizations today is in the area of decision management.[v]

That decision-making sub-system has critical functions and guardrails – it serves as "the rules of the game." For businesses, that can include a host of deterministic constraints, such as never taking certain actions outside of regulatory guidelines, limiting promotions to available capacities to fulfill, or offering products that fit the risk profile of the client. While machine learning is powerful, AI is only effective for enterprises if business leaders can effectively monitor and fine-tune these rules to optimize AI in the right direction.

Ultimately, AI is a tool for humans, which is why it has two popular modes of operation:

**(1)** In some cases, AI can operate somewhat independently, with its outcomes monitored by its creators. Its decisions are often superior in terms of scale, speed, and balance to the decisions its makers would have made.

**(2)** In other cases, AI can provide adjunct intelligence to humans, guiding and assisting them, improving eventual action paths and outcomes. One common example is providing frontline employees with real-time next-best-action guidance, where staff members leverage AI to predict the best thing to say next during a live interaction. These real-time intelligent systems are primed with customer behaviors, risk and value scores, and predictions on response likelihood, and when woken are fed contextual data, arbitrate between varieties of possible actions – even factoring in economic value – and return an optimal next step.

Figure 6:
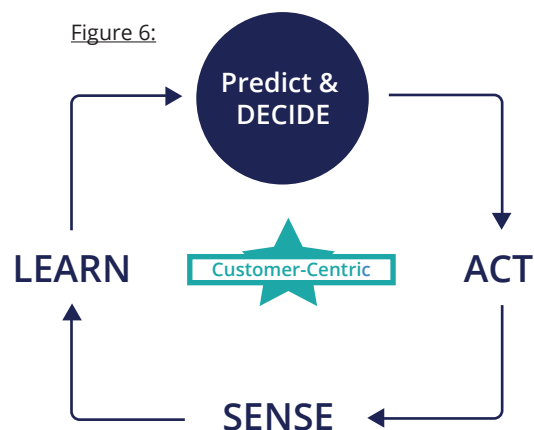
These recommended actions deliver indisputable results: Brands have routinely seen two to six times improvements in their response rates. Take, for instance, Sprint, whose CEO Marcelo Claure publicly announced, "We're seeing more than double the acceptance of retention offers. That is a big deal."[vi]

Similarly, store employees working side by side with customers also benefit from AI engines. Equipped with tablets, they can help customers find the right products and services to match their needs, provide educational materials, or resolve their problems. One of the world's largest telecommunication providers, Vodafone, won a prestigious Stevie award for their "Pusula" application[vii] ("Compass" in English), which guides more than 1300 associates toward delivering better offers and better customer experience. The result, displayed in Figure 7, was year on year revenue growth of over 60 percent, and increased NPS (Net Promotor Score) by over 20 points:

Figure 7:
Continuous revenue growth and stronger customer experience with Pusula



**Pusula Revenue**

*2.14 Mio TL ; 4 mo revenue
** 43 Mio TL: estimation

**Net Promoter Score**
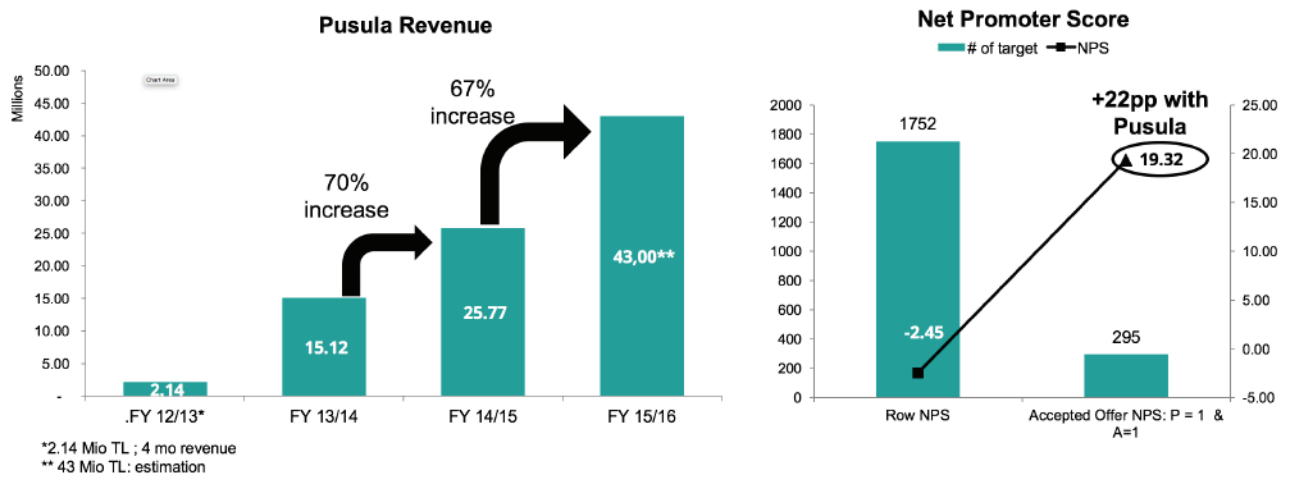
## Choose Your Vendors Wisely

Should you trust one vendor to lead you to the promised land? The short answer is probably not, especially if you are a very large enterprise, because one single solution doesn't exist. In a recent webinar[viii], Olive Huang, Research Director for Gartner, referred to the inevitable "System of Systems" that every large organization will build as they piece together a better solution for customer engagement.

Anyone who followed the venture capital spree that resulted in an explosion of AI and customer experience startups knows that regardless of how you try to organize it, there's a complex set of players – each with strengths and weaknesses.

The AI and customer experience landscape is home to a complex set of players – each with some strengths and weaknesses.

Chances are good that your company is already doing business with over 100 vendors claiming some AI capability for better customer experience. That's too many to manage effectively, especially when many have overlapping capabilities, and only adds confusion that keeps you from achieving your customer experience goals.

For this reason, brands should strive to rationalize their unique vendor landscape, and double down on several stable, agile, innovative vendors with chops for the short and long haul – ones that play unique and pivotal roles.

When selecting a vendor, keep these recommendations in mind:

- **Seek quick wins while being cautious of big bang approaches:**
Your efforts to infuse AI into all aspects of your customer's journey can and should start quickly, with a focus on a defined interaction. This lets you return value in a continuous, connected, and agile fashion. Look for a vendor that can deliver rapid value in short spurts (90-120 days) and will still be a trusted partner in the years ahead. They should be able to provide a blueprint of how these wins fit together and will lead to long-term transformation.

- **Demand proof of AI outcomes:**
Many vendors are now clamoring for attention using AI as a buzzword. Unfortunately, not all have a proven track record of the customer engagement outcomes a business may require. Some may even be just a marketing veneer covering a stack of acquired and disparate software and platforms. Require extensive proof points and customer evidence of AI driving the specific outcomes your business is seeking.

- **Ensure a centralized AI decision authority:**
While most businesses will eventually employ AI from a variety of different vendors, success will hinge upon leveraging ONE centralized customer decision hub – a single brain, serving as the central source for intelligent decision-making and arbitration across all channels.

- **Demand proof of scale:**
If you are a large business with millions of customer conversations happening every day, you need a vendor that has proven their software can scale to these levels and perform well. If your vendor can't provide proof of scale, chances are very good you will be an extension of their performance-testing lab – and you'll pay them to test their software.

# Final Thoughts

AI has enormous potential to affect our lives in positive ways. For consumers, it can automate monotonous tasks and assist in difficult ones. For businesses, it can provide a competitive edge, differentiate products and services, and even contribute to success or failure.

As humans on both sides of this commercial marketplace, we are in control – meaning we are responsible for the actions of our machines. We must feed them, program them, and monitor them wisely, or face hidden and overt consequences.

We can marvel at the potential of AI, but ultimately we should act now to reap its practical rewards. Predictive intelligence technologies can play a critical role in digital transformation – helping your business garner customer loyalty, improve experiences, and ultimately increase profits.

[i] IDC, Worldwide Semiannual Cognitive/Artificial Intelligence Systems Spending Guide, 2016

[ii] CMO Council, Predicting Routes to Revenue, 2016

[iii] Pegasystems, Artificial Intelligence Survey, 2016

[iv] Forrester, Total Economic Impact (TEI) of Pega Marketing, https://www.pega.com/insights/resources/forrester-total-economic-impact-tei-pega-marketing, 2016

[v] Forbes, https://www.forbes.com/sites/gilpress/2017/01/23/top-10-hot-artificial-intelligence-ai-technologies/#4b6d209d1928, 2017

[vi] Fortune, http://fortune.com/2015/08/07/sprint-pegasystems-customer-service/, 2015

[vii] Stevie Awards, http://stevieawards.com/sales/vodafone-turkeys-pusula, 2016

[viii] Gartner, Customer Engagement Hub Part 1 – What is it and why do you need one?, 2016

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## ABOUT PEGASYSTEMS

We are Pegasystems, the leader in software for customer engagement and operational excellence. Our adaptive, cloud-architected software – built on the unified Pega® Platform – empowers people to rapidly deploy, and easily extend and change applications to meet strategic business needs.  Over our 30-year history, we've delivered award-winning capabilities in CRM and BPM, powered by advanced artificial intelligence and robotic automation, to help the world's leading brands achieve breakthrough results.

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