PEGA: DRIVING CUSTOMER ENGAGEMENT USING AI-ENABLED DECISION MAKING

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VIGNETTE

a description of a firm's approach to an IT management issue, written according to a prescribed template

DATA MONETIZATION

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INFORMATION TECHNOLOGIES

DATA, AI, AND ANALYTICS

Pegasystems Inc. (Pega) was a 38-year-old software company based in Cambridge, MA that developed and hosted software for customer relationship manage-ment, digital process automation, and business process management. This vignette describes how Pega adapted its proprietary AI-enabled decision-making engine, Pega Customer Decision Hub, to optimize its market-ing communications. The vignette is part of a series of stories that illustrate value creation using AI.

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PEGA: DRIVING CUSTOMER ENGAGEMENT USING AI-ENABLED DECISION MAKING

In 2021, Pegasystems Inc. (Pega) was a 38-year-old software company based in Cambridge, MA that employed more than five thousand employees in forty-one locations worldwide. A publicly traded company, Pega developed and hosted software for customer relationship management, digital process automation, and business process management. The company reported $1.02 billion in annual revenues in 2020.

Pega primarily served large businesses that typically had multiple lines of business and several buying centers. To target and influence the complex network of contacts involved in a business sale, Pega engaged in content marketing. Pega's principle customer was usually a C-level executive; therefore, these executives were Pega's main content marketing target. Pega also considered these executives' direct reports, potentially responsible for distinct functions, products, or channels, to be valuable contacts. Content marketing entailed delivering Pega-unique content to a diverse business audience in ways that propelled targets through a multiyear sales process to become Pega customers or to buy additional products.

The goal of content marketing was customer engagement.

We focus on getting our customers to engage with us. We don't get hung up on old-school lead scoring. It's more about getting people who aren't interacting to interact with us and getting people who have recently interacted to continue interacting with us.

JEFF DALE, DIRECTOR, MARKETING CHANNEL OPERATIONS

Historically, the marketing unit drove engagement by communicating with potential customers via scripted email campaigns, delivering content such as white papers and analyst reports in batches called blasts that used general-purpose messaging. Marketing tracked customer engagement using metrics such as how many emails were opened, PDFs downloaded, and blogs clicked.

In recent years, Pega content marketers began to see a drop in their ability to engage contacts using the blast approach. Too many contacts

This case study was prepared by Barbara H. Wixom of the MIT Sloan Center for Information Systems Research (CISR) and Cynthia M. Beath of the University of Texas at Austin. The case was written for the purposes of class discussion, rather than to illustrate either effective or ineffective handling of a managerial situation. The authors would like to acknowledge and thank the executives at Pegasystems Inc. for participating in the case study.
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weren't paying attention to their emails, and the content provided to contacts who had been engaging was not compelling enough. Pega had been using its proprietary AI-enabled decision-making engine, Pega Customer Decision Hub™ (CDH), to help its customers optimize their business-to-consumer communications—and Pega marketing leaders wondered whether they could adapt this product to optimize the company's own communications.

CDH leveraged AI to make fine-tuned content marketing recommendations, identifying what content to send to a specific contact. Pega marketing leaders believed that the company's sales process would advance more effectively if they engaged in more selective and intelligent content distribution. Using AI, they hoped to make granular, evidence-based determinations regarding the who, what, and when of content marketing.

ESTABLISHING AI FOUNDATIONS

When license renewal for the incumbent blast marketing tool came up in 2016, Pega marketing leaders accelerated the decision to migrate content marketing to Pega's CDH tool. The Pega solution had to be rolled out in just a few months, before the license for the existing tool expired.

Initially, the rollout was a little rocky because we had to rush, and the users weren't ready to change. And we didn't have the right data or enough of the right content to present to the right customers.

VINCE JEFFS, SENIOR DIRECTOR, PRODUCT STRATEGY, MARKETING AI & DECISIONING

Before the team dove into AI modeling, it established three key AI foundational activities. The first activity was **building a new platform**. The company's incumbent tool provided email distribution while Pega's platform did not, so the marketing team quickly secured services from an email distribution vendor and integrated its product into the Pega platform. The new tool was an industry-leading email delivery solution, which ensured stability and performance.

A second foundational activity was **creating content**. The team engaged Pega subject matter experts to create content, then had it vetted by copywriters, brand mavens, and marketers. Previously, Pega had developed or acquired content expressly for a specific blast campaign; the new decision-making engine would match content to recipients, necessitating creation of candidate content in much greater volume and of a broader variety. This content also had to be preapproved; as a precaution, everything that might be sent to a customer needed to be acceptable for any customer to receive.

The matching ability of the decision-making engine also required that the team tag all content with characteristics that could inform its relevance to a contact, such as the content's language, domain area (e.g., technology, marketing), product eligibility, and the point(s) in the sales cycle it supported. For example, Pega marketers believed that new contacts needed high-level content that built awareness; later in the sales cycle, contacts would want more relevant content, such as a data sheet.

A third foundational activity was **cleaning up Pega's customer and contact information**. The team pulled data from three key sources: They took first-party data on customer sales histories and sales contacts from Pega's order entry system. They used third-party sources to get company details such as geography, business size, and headcount. Finally, the team drew on behavioral data generated by Pega's engagement channels, such as email or the Pega website. For example, the tally of how many times a contact had clicked on an email or registered for an event via the website was captured in the contact's record.

Matching contacts with content required an understanding of the relationships among contacts within each business customer or prospect, which could be very complex. Pega's marketing team worked with the sales unit to identify company attributes and cleanse contact data—e.g., remove inactive contacts, fix wrong information, add known preferences, note where contacts were in the sales process—that might ultimately be used for automated decision making.

These activities took a year for the team to iron out.

USING AI FOR EMAIL CONTENT MARKETING

An adaptive model the company developed called next best action fueled CDH. This model used predictive analytics and machine learning to calculate the next best action for multiple interactions. The model evaluated a set of criteria that influence the relevance of an action, offer, or content to an individual.

The project team trained the AI model by exposing it to a variety of potential predictor criteria. Some criteria were included based on past marketing experience; for example, many experienced marketers believed that a person's functional area influenced content preferences. Other criteria drew from actual historical activity; for example, contact records included data on past offers and responses. Through iterative training, the model calibrated how useful the different criteria were in predicting particular customer actions; if the goal was to drive a particular outcome, the useful criteria would be those that optimized a contact's propensity to act toward that outcome.

The project team also created a set of business rules to further shape the model's process of choosing the next best action. For example, these rules specified that an email about a white paper would not be sent to anyone who had already read the white paper. And a contact based in a country where English was not the preferred language would receive emails in the country's native language.

The goals of the model were to optimize content offerings, to choose the best email out of hundreds of emails in inventory to send to a specific contact, and to know when to send an email. Pega calculated what represented "best" using two optimization levers: *propensity*—the likelihood that a customer would respond to the outreach—and *value* of the outreach to Pega. The team could adjust the levers to balance Pega's and customers' needs. For example, the team was likely to weight toward Pega's needs emails about Pega events, particularly when an event was happening soon and needed to attract attendees; and emails about the release of a positive analyst report, which Pega wanted to get in front of customers while the news was fresh.

After the model was adequately trained, the team ran a pilot test of the model to match customers to email content using a small group of contacts that the company assessed to be low risk for mismarketing.

We evaluated the pilot results quantitatively and qualitatively, and the results were awesome. We sent fewer emails—and we had a 5x open rate and a 10x click rate compared to the old way. Those results really got people's attention and got them interested in wanting to use this.

JEFF DALE, DIRECTOR, MARKETING CHANNEL OPERATIONS

After this successful pilot, the project team broadened the scope of CDH-selected email content marketing to the full contact database. As contacts reacted to the emails, their behaviors were captured as outcomes. The team used the outcomes to evaluate and report on the model's performance, and periodically to improve the next-best-action model itself.

CHANGING WORK PRACTICES

AI-enabled decision making represented a big change in the nature of content marketing work at Pega. Historically, content marketers had owned a set of contacts that were the most likely recipients of their content. Before sending any content, they would first select a small sample of contacts, send some test emails recommending the new content, and then observe which recipients clicked on it and which didn't. After evaluating the results using Excel pivot tables, they would ultimately decide which version of an email was right for a particular segment of their contacts. This time-intensive process meant that marketers could only consider a small set of dimensions or variables when matching content to contacts.

This evaluation process was followed by yet another time-intensive process of calendaring and prioritizing the actual sending of approved emails on behalf of marketers representing different industries, functions, geographies, and offerings.

Until the introduction of CDH, we did manual segmentation. That's what you do in marketing—you define the target. Which functional area? Which management levels? Which verticals? Which regions? Therein lies the problem: You had multiple marketing managers, representing multiple areas of the business, trying to share and optimize the use of a very limited number of contacts, using disparate data to make these critical decisions. There was always risk of fatiguing contacts and, maybe even worse, your target finding the content to not be relevant.

PUI CHI WONG, DIRECTOR, GLOBAL BRAND PROGRAMS

The process could become uncomfortable when different stakeholders had conflicting views regarding whose email should go to whom and when.

Every single email we send requires a marketer to say to the email team, "I need to send these words, on this page, to this group of people." Then they say they need to send it tomorrow. Then someone else says, "No, I need my email to go out tomorrow!" And they have a conflict.

JEFF DALE, DIRECTOR, MARKETING CHANNEL OPERATIONS

Dale explained that AI streamlined and depoliticized content marketing by taking over the busy work of email management and freeing up marketers to "drive deeper value with other programs." Email distribution planning was now almost completely automated.

The distribution itself also had a different cadence, referred to as "always-on outbound." An email went out when and if CDH decided that the customer wanted to receive it (or if Pega deemed it highly valuable to send it). After a new email was placed into inventory, it might be sent at any point. This required a change in mindset for content marketers.

I had to get comfortable with the idea that my content is reaching the right people despite the fact that I no longer had a hand in selecting the target audience and that the potential contact pool was much smaller. I had to trust that the AI could pinpoint the right time and offer to send to a contact much better than I as a human can, and it has been proven out in most cases. Since the start of using CDH for webinar emails, we had unparalleled year-over-year increases in open rate by 2x and increases of average click-through rate by 3x. This was possible because of the ability of CDH to get the most relevant offer to the right contact when they were ready.

PUI CHI WONG

After CDH took over the work of email distribution, content managers had more time to spend on more appealing work tasks.

CDH lets me do more important work and less rote work. No one wants to spend all day working in an Excel spreadsheet orchestrating and deconflicting email sends. Marketers want to spend their time on strategy, digging into data for insights, optimizing content and programs. CDH also helped in retaining really great talent who don't want to do boring work.

PUI CHI WONG

ESTABLISHING ONGOING CDH MANAGEMENT

The CDH project team established ongoing management for the model. Monthly, Jeff Dale conducted deep dives into model reports to review model performance. If performance metrics dropped, the team would investigate root cause and remediate as needed. Sometimes fixes meant adding or changing email content. Sometimes a model whose performance was degrading needed to be switched out and replaced with a retrained, measurably superior model.

The team continually needed to validate and defend the model. In one case, a content marketer came to Dale and was certain that the next-best-action model was not working for his webinar. He demanded that the model be overridden and that his email be sent to a large segment of people.

I said, give me a chance, let me change the value lever. Then the next day, the Customer Decision Hub sent more emails and seventy-eight registrations came in for the webinar [see exhibit 1]. That helped him see the impact of trusting the system and gave me a chance to use the levers the way they were designed.

JEFF DALE, DIRECTOR, MARKETING CHANNEL OPERATIONS

The project team formally presented CDH across Pega to various audiences to deepen awareness and buy-in. They laid out the next-best-action model mechanics to content marketers so that the marketers understood things such as business rules, model criteria, and outcomes. The team explained where human influence could come into play, such as the use of the propensity and value levers. The team also cited instances where the model seemed to make better judgments than people.

CDH might realize that even though we don't like to send marketing content to IT people, this one marketing white paper happens to be piquing a lot of interest within the IT group. So, our Customer Decision Hub is going to send it to them.

JEFF DALE

Dale and his team anticipated that model evangelism would be repeatedly necessary due to employee turnover. There was a constant stream of new employees who needed to understand the next-best-action concept and how CDH worked. Over time, the project team recruited others to help evangelize and accelerate what Dale called "pragmatic adoption across Pega." Dale explained that pragmatic adoption meant a responsible diffusion of CDH that achieved good business results.

CONTENT MARKETING IN 2021

By 2021, Pega was using AI to make granular decisions about email outreach at scale, based on dozens of influencing factors. And the CDH project team continued to hone and improve the next-best-action AI model performance. Because of the length of Pega's sales process, the team expected that it could take a long time to develop a deep understanding about how changes in content marketing influenced sales.

Email content marketing work tasks became less focused on the coordination of email distribution and more intent on crafting email content. The marketers had more time to identify "white space"—areas where Pega had contacts, but no content—and fill that void.

As the use of CDH within its email content marketing became routine, Pega was intent on broadening the use of CDH to other channels, such as the company's website, and Pega Communities, a forum for customers using Pega products. The CDH project team viewed evangelism as key to further diffusion.

I'm spending a lot more time now figuring out how we can expand to other channels. And to me, sales is a channel. CDH could give salespeople guided selling tips like, "This is the thing you should talk to this lead about." Marketers have the data and analytical expertise, while salespeople want a warm lead and something relevant to share with them. So if we can create a little next-best-action widget saying "this is what you should do next," that's going to go a long way.

JEFF DALE, DIRECTOR, MARKETING CHANNEL OPERATIONS

Dale noted that while CDH resulted in marketers having less control over who would receive what content, salespeople acquired more visibility into what content their customers were receiving.

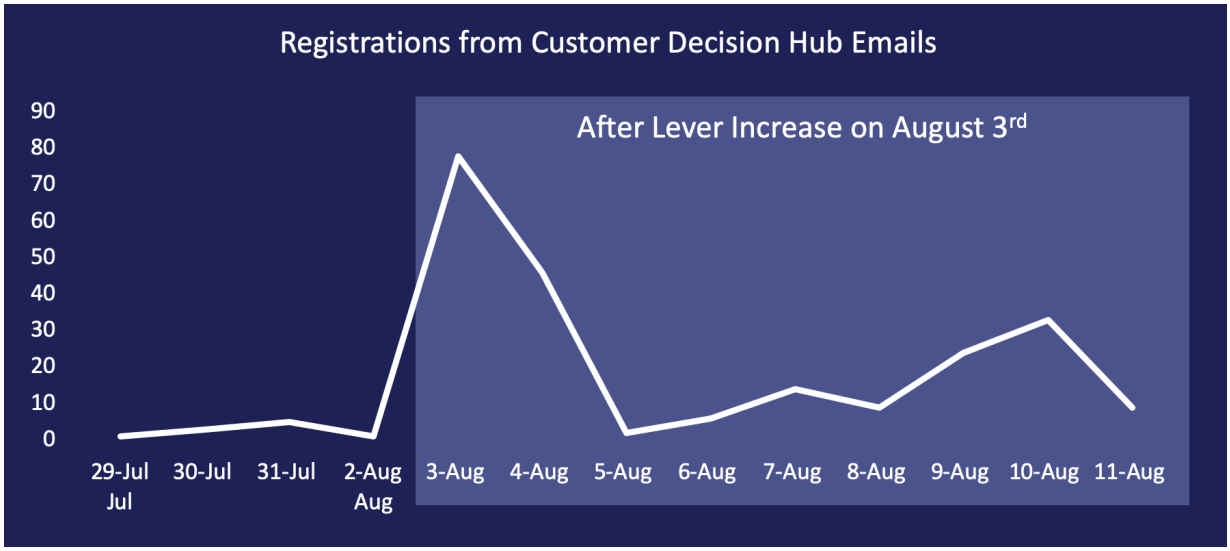
ENVISIONING THE ROAD AHEAD

In mid-2021, Pega's marketing team was planning to leverage some of the new features of Customer Decision Hub that the company had developed for customers, such as Value Finder, Scenario Planner, and 1:1 Operations Manager. Dale's team was always interested in which clients were underserved or underengaged, and Value Finder would help identify these opportunities. Scenario Planner and 1:1 Operations Manager were features that would help his team understand the impact of changes to their next-best-action policies or CDH's configuration, and move changes into production in a systematic and agile way. Dale saw promise in these advanced features to further democratize both finding insights and controlling how changes to Pega's marketing initiatives were executed.

In this market, we must constantly innovate, or risk becoming irrelevant. Our internal and external customers expect us to bring AI and automation innovations to the market that ultimately give them a competitive advantage. And they want these to be intuitive—something everyday business people can not only understand but get their hands on.

VINCE JEFFS, SENIOR DIRECTOR, PRODUCT STRATEGY, MARKETING AI & DECISIONING

Exhibit 1: An Example of the Impact of Lever Adjustments in Pega's Customer Decision Hub



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