The Role of Chief Technology Officer in Product Development:

A Case Study At PeriGen

By Loretta W. Prencipe

Mike Pritts is the chief technology officer (CTO) for PeriGen, Inc. based in Princeton, New Jersey, a company that delivers advanced obstetric clinical decision support and documentation systems, as well as fetal monitoring systems, for hospital labor and delivery departments. He is responsible for ensuring that the company's software,used by more than 15,500 medical professionals,—incorporates the obstetrics protocols and best practices used during the labor and delivery process.

PeriGen, Inc. was founded in 1995 to assist clinicians in providing the safest obstetrical care possible. PeriGen invested more than 5 years in development and testing, and over 250 physician years of work in decision support development, and is the only company in the world supporting over 310,000 births with a clinical decision support system. PeriGen, Inc. is a technology-enabled professional services company specializing in risk reduction and clinical quality improvement in obstetrics.

PeriGen provides real-time solutions and consulting services that reduce risk and improve clinical outcomes. Focusing its initial solution on a hospital's obstetrics department, which typically accounts for 40% of a hospital's medical malpractice cases, PeriGen has demonstrated statistical reductions in risk and prevented a critical error in 1 in every 9.5 deliveries. The PeriSuite offering provides proven solutions along the obstetrics continuum: prenatal, labor and delivery, and postpartum.

Pritts joined PeriGen in 2008 with a background of healthcare technology and information systems. Prior to joining PeriGen, Pritts was vice president of research and product development for Misys Healthcare Systems, which offers an electronic medical record (EMR) and project management system. He managed a 450-employee multinational product

development organization and led the growth of Misys' EMR solution from 400 to 1,900 installations within 5 years to capture the largest market share of any EMR vendor, and increased productivity by 300%. He was responsible for all aspects of the product development lifecycle including research and innovation, development, packaging and delivery, and infrastructure services. Before Misys, Pritts was director of product development and technologies for an aggressive dot com start-up, Invisible Worlds, Inc., and was handpicked to lead the product development team at LexisNexis. He holds a BS in Computer Science from the University of Pittsburgh.

THE ROLE OF THE CTO

PeriGen expects it will support an approximate 244,994 births this year or a new birth every 2 minutes. The role of the CTO in this company is critical.

Many hospitals and medical companies have chief information officers (CIOs) overseeing the organization's information technology (IT) system and infor-

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mation delivery and access. It's the role of CTO—which emerged in early 2000s and is still not as widely found in the healthcare industry—that's often charged with aligning business goals and product development.

CTOs typically are charged with aligning the company's technology vision with its business strategy.

"Most CTOs of healthcare technology companies own the development, delivery, and support of the technologies and products that differentiate their company," says Tom Berray, managing partner and CTO of Cabot Consultants, an executive search firm outside Washington, DC. "Many executives on the delivery side of the healthcare industry don't really understand how the CTO role functions and how it can be a driving innovative and business force for the company."

THE TECHNOLOGY PORTFOLIO AT PERIGEN

"The technology is the heart of what we do," notes Pritts, who has been with PeriGen for approximately 1 year.

By comparing the clinical care ordered against published standards of care, PeriBirth can recommend alternative care plans that incorporate best-practice protocols for each patient, based on that patient's specific clinical condition as it changes over time. By analyzing changes in patterns of care and the patient's condition—in real time—the PeriBirth system has prevented a clinically significant error in over 10% of deliveries.

Pritts explains how PeriBirth works. "When mom and baby–or babies–are admitted to the L&D floor, our system captures all of the clinical encounter documentation and creates the electronic file. It's streamed into the clinical decision support system and the input from care providers and from devices is captured and documented."

According to Pritts, the innovation of the PeriBirth system is that the information is both entered by clinicians and automatically pulled from other available sources, that is, the fetal monitoring strip and lab reports, to present a total picture of mother and baby. This information, which includes patient vital signs, type and stage of delivery, details on any pre-existing conditions, and other data critical to patient safety at L&D is constantly evaluated against built-in protocols in the software. "Medical best practices are built into the program. The data is constantly being exercised against those best practices. It delivers decision support capability. [The system] provides the tap on the shoulder at 3 a.m., say, to the caregiver—when the nurses are short on staff or busy and many moms are in the L&D process."

"The technology is at the heart of what we do," notes Pritts. "PeriGen's proprietary system integrates a medical knowledge base, patient data, and artificial intelligence to produce real-time, patient-specific treatment prompts."

Given that the PeriGen system serves the medical industry, Pritts takes his role in driving the software solution offerings very seriously. "The 'buck stops with me' in terms of the product we deliver to market... The product must work 24/7 and must be clinically correct all the time. It is a life and death environment that we participate in. How we deliver that solution ultimately is my responsibility."

Pritts' staff of 65 includes senior vice presidents of product development, information architects, and site managers at remote offices. Among his staff are around 20 medical clinician staff members, who constantly review content and incorporate the most current protocols into PeriBirth.

The firm's medical director manages and leads the clinical organization of nurses, midwives, obstetric physicians, and others experienced in labor and delivery. "They apply practical experience to research. My office then takes that research and internalizes it, intellectualizes it, and 'operationalizes' it. [We] build a construct that forms to how our system digests that information."

"Digesting" information into the software is a key part of the CTO's function. The CTO's office oversees an important last step for that information, using proprietary tools and processes to enter the clinical content into the PeriBirth system, which has a rules engine that's constantly being fed with the best and latest medical content. "The system has over 6,500 rules and protocols that are always working in real time," notes Pritts.

While Pritts works across a variety of internal teams and functional responsibilities to translate medical protocols into the always-on software solution, he also meets with PeriGen customers--hospital CIOs. "They come from a tech background. They have a strategy across an entire hospital. I can show them how [the software] will fit into the rest of their technology strategy."

He helps the CIOs understand how the solution fits into their budgets, what it takes to use the solution successfully, how the product is delivered and installed--essentially interoperability across the CIO's IT platform. "How we do that is really important. I show them how the solution will be successful for the hospital, for the clinicians, and ultimately for patients."

Pritts also has a developing role in the strategic build-out of PeriGen's patent portfolio, which came to the company through the recent acquisition of LMS Medical Systems, the world leader in fetal sur-

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veillance, interpretation, and archiving. "These patents all involve clinical content with a software solution. From a product strategy perspective, I will help insure that the research and development is in line with the product strategy. As the research is in the delivery phase, if there is patent capability in the materials going to product development, I will work with corporate counsel and others to review and move it forward. It will start from the product strategy perspective."

Developing fetal monitoring software for use in labor and delivery means that some of PeriGen's solutions fall under FDA oversight. For some companies and some executives, this could change the company's core. "It's a tough challenge to keep an innovative DNA in a company," says Pritts.

Pritts works to keep innovation and creativity moving ahead at PeriGen. "You must ensure that [your company] has the experienced people who have the brand in their peer circles—the researchers, scientists who are tested, tried, and true. And that they have ability to think innovatively and critically and can apply that to their theories and ideas and be able to hand that to an organization that can deliver."

Pritts also says that it's equally important to have a fresh perspective from the younger generation who can learn and be mentored by the more experienced innovators and researchers in the company.

The process and vision must also be supported by the company's leadership, says Pritts. "You have to provide visibility to creation and innovation. If you just turn that into something practical for the business, that's not enough. You must provide the capability and the organization infrastructure to support getting the word out and assisting them in getting published and getting the patents through the process."

Pritts notes, "It may take a while to get the right mix of people but it is worth it. It is my job to leverage. I had to balance and provide freedom for these ideas to generate." ■