Executive Brief:

Mending Healthcare's Broken Billing Relationship

By Gem

There is little doubt that the U.S. healthcare delivery system is broken.

Costs go up while access goes down. Delays worsen while privacy is compromised. Politicians seem helpless to execute meaningful reforms, while patients suffer, both in terms of their health and their pocketbooks.

Information is the lifeblood of modern healthcare networks, but how information is managed presents an obstacle to security and user-centric technology.

The major issue at the center of the data dialogue involves the inefficient, outdated and complex manner driving medical claims processing.

The Broken Billing Relationship

Improving patient-provider-payer dynamic is often considered a zero-sum game. Rising costs for the patient are driven by a growing share in patient responsibility for payment. Collecting from patients is a bad business, which is causing provider costs to increase. This results in increased patient responsibility and reimbursement demands from payers. As reimbursement demands go up, payers reduce coverage and increase premiums. The cycle continues as the broken billing relationship is strained by inefficient technology[1] and changing regulation.

In research conducted by ARK Invest, allowance for doubtful accounts accounted for 94.5 percent of Hospital Corporation of America's out-of-pocket accounts receivable. This means that HCA projects a 5 percent likelihood of collecting out-of-pocket payments directly from patients after it administers services. From 2007 to 2015 as the percentage of HCA's potentially billable, but uncollected revenue rose, service charges increased by roughly 20 percent.[2]

In order to fix the zero-sum game, hospitals must be able to predict their revenue accurately and quickly calculate billable costs. A transparent accounting framework is needed for the payers to adjudicate claims in a dynamic environment. The patient responsibility should be collected at the time of service.

New technologies like cloud storage, API connections and mobile applications address the problem by attempting to centralize, connect or aggregate access to crucial billing information. But a more nascent technology has emerged as a dark horse candidate for catalyzing modern health — blockchain technology, the distributed accounting platform that underpins Bitcoin.

[1] 15 percent of every $1 collected by the provider covers claims processing, billing, payments and debt collection.

[2] These figures are derived from the percent of potentially billable revenue that Hospital Corporation of America (HCA) is never able to collect. Data sourced from HCA 10K Statements 2007-2015 by ARK Investment Management LLC.

A Pivotal New Tool:

The advent of blockchain technology is ushering in new methods for solving age-old data management problems, key among them is transactional transparency and data integrity.

In the healthcare arena, the need to resolve the current medical claims roadblocks that are hindering the larger healthcare landscape has prompted many companies to explore blockchain technology as a pivotal tool.

Healthcare executives are being advised that health information exchange has the potential to be transformed by blockchain technology. The opportunity is early enough to influence the direction of the technology, with several companies having deployed successful projects including Guardtime, Philips, MIT and PokitDok.

Gem, working in collaboration with Capital One, is now utilizing blockchain technology to directly address one of the biggest issues facing health insurance payments[3]: long wait times for provider payments.

[3] Reducing the time to collect from patients and insurers could result in $23 billion in savings, according to data sourced from National Health Expenditure Data, Centers for Medicare and Medicaid Services, AHRQ, IMS Institute, Blue Cross Blue Shield, Guru Focus and more by Ark Investment Management LLC.

From the Stone Age to the Tech Age:

Up until recently, medical claims were submitted exclusively in paper form. However, with advancements in healthcare IT,[4] and the 2009 passage of the Health Information Technology for Economic and Clinical Health Act (HITECH), more and more claims are now being made electronically with huge cost savings. While paper-based claim submissions each cost healthcare systems about $2.58, electronic claims cost merely $0.54 each, according to a report from the Council for Affordable Quality Healthcare.

This development in online claims processing has been valuable in reducing paperwork while ensuring timely delivery, but the massive volume of data involved,[5] along with backlogs associated with centralization, lack of security, and lack of data integrity, have been difficult to overcome.

[4] U.S. Health IT spending is expected to reach $100 billion by 2017, according to Cognitive Medical Systems.

[5] In 2011, data from U.S. healthcare systems reached 150 exabytes. From there it has grown, expected to reach the zettabyte (1021 gigabytes) and yottabyte (1024 gigabytes) scales, according to the National Institutes of Health.

The Long and Winding Road:

The arduous medical billing saga begins when a healthcare provider treats a patient, prompting a bill of services to be sent to a designated payer, typically a health insurance company. The patient is responsible for paying the insurance deductible post-visit and providing payment insurance information to the medical provider.

The medical billing staff then initiates the claims process with a pre-registration form where information such as the patient's name, birthday and insurance policy information are all captured. The accuracy of this medical record information is vital as it helps to ensure that the billing process can be executed expeditiously and accurately. This information flow must also be compliant with patient privacy legal requirements as mandated by the Health Insurance Portability and Accountability Act (HIPAA).

The insurance medical claim provides the payer with important information about the diagnosis, procedures and charges. It is critical to confirm that the fees charged are accurate and that every code submitted is billable before it's sent to the insurance company for reimbursement in a timely manner.

In order to compete in today's healthcare environment, with thin margins and onerous regulations, efficient medical claims processing systems are a make-or-break for any organization. A well-managed revenue cycle can help minimize time spent on administrative processing activities, while maximizing revenue, unobstructed cash flow and, put simply, survival.

Finally, there is the insurer side of the equation. According to the American Medical Association (AMA), a staggering 20 percent claim payment error rate among health insurers reflects an unacceptable level of inefficiency resulting in a loss of around $17 billion each year. This alone reflects the need for fresh technological advancements for fostering a new normal in claims processing.

Reinventing Medical Claims Processing:

In late 2016, Gem, in collaboration with Capital One, embarked on an initiative to deliver a successful blockchain prototype of the full lifecycle of a medical claim.

This technology, when tied to an understanding of client needs, demonstrates that healthcare providers and payers can efficiently and securely manage healthcare claims, on a network that can be leveraged to reduce strain from a basic business workflow.

It's a powerful idea. Blockchain technology can link the billing ecosystem to a network infrastructure that companies can use as a shared utility to distribute standards and applications, without compromising privacy and autonomy.

Rather than having one or two centrally managed portals gatekeeping digital transactions, blockchains provide an immutable, digital ledger spread across a network of synchronized, replicated databases visible to those with access. Because all healthcare stakeholders involved in claims adjudication have access to the same view of the ledger, a basis of trust is created, leading to a coordinated information exchange between related and unrelated parties.

The fact that one block in the chain is impossible to hack without simultaneously hacking the others makes blockchains inviolable—offering decentralized and completely secure access to protected health information. According to data collected by the Department of Health and Human Services, protected health information breaches affected over 113 million people in 2015. Among many other benefits, this security makes HIPAA compliance quite feasible for patients and providers.[6] Nearly 90 percent of healthcare providers were breached in the past two years, according to a study by the Ponemon Institute.

Blockchain technology's main value proposition is tied to the reduction in the time needed to collect from patients and insurance providers.[7] It allows for the restructuring of transactional relationships between providers and patients so that billing arrangements are transparent, fast and secure. Moreover, hospitals are better able to create more predictable revenue cycles, contributing to their cash flow and overall profitability.

[6] According to Competitive Enterprise Report, the cost of regulation in the healthcare industry is $190 billion per year.

[7] HIPPA grants providers 30 days to complete records requests (with a single 30-day extension available), and many providers take at least five to 10 days to fulfill requests, according to American Health Information Management.

A Powerful Partnership:

Gem and Capital One have joined forces to deliver a full-cycle prototype of a medical claim on the blockchain. In conjunction with healthcare e-commerce API provider PokitDok, Capital One is also developing a system that will estimate patients' out-of-pocket healthcare costs, a highly-sought-after feature for consumers, as out of pocket spending per capita has risen by about half since 2000, according to *The Wall Street Journal*.[8]

All of this supports the contention that blockchains will make medical claims tracking more secure and efficient. According to a 2017 Becker's Hospital Review report, the benchmark for hospital executives for accounts receivable is 48.4 days. Gem's platform can help settle a claim in less than five minutes.

When asked about the company's decision to pursue involvement in the medical claims and analytics space, Adam Hoffman, SVP and head of treasury management industry specialization at Capital One, noted that the company decided to pursue involvement in the medical claims and analytics space after spending considerable time observing the day-to-day operations of its healthcare clients, from the instant patients scheduled their appointments to the moment they received their bills. It was here, said Hoffman, that they saw the challenges their clients faced in managing claims.

Hoffman went on to note that healthcare providers rely on multiple, standalone, third-party software solutions that contain the data necessary to generate claims, yet these systems rarely communicate with one another.

"Providers must work around these operational disconnects, typically by manually reentering data from one system into another," Hoffman said. "We felt this was a place where we could help."

These issues sparked Capital One's commitment to assist its healthcare clients in efficiently bridging interoperability gaps, while removing unnecessary friction from the claims management process. Recently established technologies, such as blockchains and APIs, are an efficient and cost-effective way to connect the disparate systems used to create and manage claims.

"What makes blockchain technology so compelling is the potential to establish shared infrastructure to communicate information in a highly efficient way, while at the same time protecting privacy and security, which are so crucial in both the financial services and healthcare industries," concluded Hoffman. "Ultimately our goal is to create meaningful and positive change for our clients in a way that feels effortless for them."

Connecting Claims to the Blockchain:

GemOS serves as a platform for building and deploying distributed applications. It connects existing systems to blockchain networks, enabling the automation of arbitrary business processes using the data and identities of those existing systems. The platform provides the necessary foundational elements to not only utilize blockchains, but to also power the processing of complex business rules required to achieve multi-system automation.

This system enables custom logic development, creating scalable blockchain applications for healthcare. With GemOS, Capital One created the representation of the legacy EDI 835 and 837 payload via the GemOS resource management solution and document registry within the logic and execution service.

This showcases multiple benefits the first being rules validation of CPT and ICD codes, which replaces the 100-page PDF provided by each payer to integrate into their systems. The second benefit is that payers are able to subscribe to new claims created and hashed on the network through an event observer function, which fetches the pointer to the data living in the provider's data store. The third outcome Gem demonstrates is that providers can receive a patient's explanation of the benefits in an automated fashion based on document validation rules and prescribed adjudication logic triggered by GemOS.

The ultimate goal of GemOS is to present a scalable, flexible platform for building, deploying and managing distributed applications, like those for medical claims management. With that goal in mind, GemOS was designed based on a few core principles:

- Well-defined and well-managed microservices to boost functionality, isolate sensitive data, enable responsive and efficient scaling, and provide a framework for future improvements.
- Event-driven architecture to construct fast, responsive systems while providing support for alternate modes of operation.
- The exposure of high-level abstractions of distributed application foundational elements in a powerful, well-understood programming environment, to simplify the development of extensions, adapters and applications.

The GemOS platform provides explicit mechanisms for both real-time and historical event processing, a key component of medical claims management. All participants of the network can view transactions being created within the claims applications in the GemOS transaction viewer as a proof to the transactions and events occurring in real time. This dual-processing capability facilitates complex business rules execution for certain use cases.

Strategic Execution:

How to get started on a blockchain solution?

Below is a list of questions for healthcare executives who are seeking to launch a blockchain initiative targeting improvements to medical claim processing systems.

Organizational Questions:

- What is the specific problem your organization is trying to solve with blockchain technology?
- Does your problem exist between multiple disparate systems, companies or data networks? What is the symptom: inefficiency, operational fees, errors/fraud?
- What is the timeframe in which this problem needs to be solved?
- If your challenge is between companies, is your organization position to drive the solution? What partnerships will be required?
- What are the technical requirements and are those resources available to solve the problem fully?
- What is the scope and reach of the project? What is the highest expected outcome as a result of this change?

Vendor Questions:

- How will blockchain technology be used to solve organizational problems? Can additional use cases for healthcare and medical claims management be recommended?
- Who owns the intellectual property on applications built on the platform?
- Is the platform full-stack? Is it infrastructure / protocol agnostic? It is modular?
- What does the platform enable now and in the future?
- Can an example of a similar project that has be executed in healthcare be provided?

Entering the Real Word:

The development efforts of Gem and principal partner Capital One are based on the real-world premise that blockchain technology must not only address the interoperability issues that often serve as major roadblocks to an efficient medical claims system; the technology must also fuel more standardized practices as well as research and innovation.

The collaborative work that comes out of this partnership is intricately tied to the transparency and trust that can be infused into the process through the blockchain's peer-to-peer distributed qualities, boosting the speed and accuracy of the claims ecosystem for both healthcare organizations and patients. -

Contact Gem to learn more about how data can be registered, authenticated and securely shared to unlock its hidden value.

For more information:
Contact partnerships@gem.co