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How blockchain can impact public entity pooling

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There was a time when the term "computer" was used to describe a person, not a machine. The computer calculated mathematical equations to support functions ranging from accounting to engineering.

The recent movie, "Hidden Figures," tells the story of computers – people, not machines – who helped launch the United States' first orbit around the earth. But there's also a secondary story about NASA's first data processing unit being installed simultaneously with that famous launch.

Public entity pooling isn't the same as space exploration – not rocket science, you might say – but there are lessons from that time of transformation we can use in today's pooling environment.

Until data processing was introduced, computing was manual, slow, and prone to errors. It was, after all, based upon the work of humans and therefore limited by a number of influences. Significant advancements now provide us with machines a fraction of the size of those early data processing units. And further revolutionary advancement is yet to come.

Computing now focuses less on machines and more on the power they offer. Computing companies may provide hardware, but more importantly they provide transactional support for typical business operations. Enter the blockchain.

Blockchain is the technical underpinning for a form of Distributed Ledger Technologies (DLT) that promulgates a trusted, shared ledger. Maybe your first impression upon hearing about a "ledger" system is to think of a tool useful primarily to the accounting function. While blockchain has value in accounting, it is not limited to balancing the books.

Blockchain is a ledger, or data source, that is verified by all parties involved in a transaction, validated by cryptographic algorithm, and distributed. Because transactions in distributed ledger have been agreed to by all parties and securely locked before sharing, there's no need for a third party to verify data captured within the ledger. This effectively eliminates the need for clearinghouses or intermediaries.

You might think of blockchain as multiple immutable copies of limited sourced and relatively small datasets. One set of data are a "block." Upon creation of each block, every organization involved agrees the data are accurate and receives a full copy of the block. Multiple blocks of validated and secured data create a blockchain of transactions. As blocks are added, the blockchain is formed in simultaneous, distributed fashion.

There are some key elements to blockchain:

- Blocks of data are relatively small. A block is data around a certain transaction, not an entire database of information.
- Blocks can be additive, forming a blockchain. The entirety of a blockchain, or several blockchains, might contain the breadth of information you would expect within a database.
- Blocked data are secured against tampering. Everyone involved has agreed to and validated the transactions represented in the block, and the block is then locked into its position in the blockchain through cryptographic means.
- Even if one block were disrupted – through data corruption or a hacker – the distributed nature of blockchain means any block can be verified against the distributed ledger, and the chain remains intact.

A description of what blockchain is seems less compelling than a description of what it can do. Perhaps the most valuable way to understand blockchain is to conceptualize the impact it could have on public entity pooling. Using one example of potential blockchain implementation – public entity payroll and a work comp pool – we can understand and imagine the way blockchain might transform the business operations of a pool and its members.

First: Public entity payroll systems become enabled by blockchain.

A public entity employee submits an electronic time sheet that is verified, also electronically, by the supervisor. Once approved, the time sheet is automatically validated against the employee's sick or vacation accruals, and the employee is assessed contributions against earnings for things like taxes, insurance, or retirement savings. This payroll validation process is repeated for every employee of the public entity.

Accepted and approved payroll, with accruals and related allocations, become a block. This block is shared between the public entity and its bank.

The bank deposits employee salaries directly into their accounts and simultaneously distributes any accruals or expenses to other accounts or banks.

The process is replicated every pay period, forming a chain of locked and distributed payroll transaction blocks. Transactions are verified in small increments and built over time. Payroll blockchains are systematically verified, locked, and linked. The entire payroll system for this public entity is a chain of all payroll cycles, shared by the public entity and its banking partners.

What's missing from the first step of this blockchain example? The payroll vendor as intermediary. In a blockchain environment, intermediaries become less necessary because the validation of data and transactions are happening real-time in a closed environment, with consensus by all parties.

Second: Financial audits become more about systems than income and expenses.

Blockchain's inherent protections against tampering and counterfeiting, or other disruption, won't get complete traction with independent financial auditors. But recreating the exact financial trail is unnecessary in a ledger environment where every financial transaction is built by consensus, conducted real-time, locked and distributed to all parties. Integrity is maintained by uniquely linked blocks.

Instead, the focus of a financial audit – in this case, an audit of the public entity's payroll payments – will assure the blockchain system is operating as expected. Public entities should see real opportunity to "close the books," whether monthly or at the end of a fiscal year, much more quickly, if not real-time.

There is a possible downside to the security of blockchain. Once a data block has reached consensus and is locked, there's no going back to adjust a published transaction. Any changes must be accomplished by forward adjustments, although the need for such corrections in a blockchain environment should be almost nonexistent.

Third: The work comp pool becomes a party to the member entity blockchain.

Based upon this example, consider the implications and opportunities for public entity pools that provide workers' compensation coverage.

Pools determine member work comp contributions by applying a class code rate against underlying payroll for member entities, adjusted for any experience modification factors or similar underwriting debits and credits.

If hours per payroll class code can be applied alongside the payroll blockchain for a public entity, a workers' compensation pool would know exactly the right contributions for every member entity employee, concurrent with each payroll cycle.

In other words, contributions from the member entity to the pool for workers' compensation coverage could simply become another blockchain.

The work comp contribution – employee payroll multiplied by the rate per class code – could be validated by the pool and the public entity, secured, and distributed to both parties. At the same time the public entity's bank is transferring earned income to employees, it can transfer to the pool the apportionment of work comp contributions based upon the work comp blockchain.

Fourth: Workers' compensation underwriting becomes highly automated.

If this example were implemented, the routine mechanism of assigning contributions per class code and the need for annual payroll audits would be obsolete. There would also be no reason to invoice members for annual work comp contributions or manage other banking-related transactions for work comp coverage.

There would still be a need for annual work comp rate setting, overall and by class codes, and determination of the financial adequacy of work comp contribution rates. But once the annual leveling of contributions was determined, it would be relatively simple to build a system that applied experience mods or other discounts alongside the ongoing payroll blockchain transactions.

On the whole, underwriting and collecting contributions for workers' compensation in a blockchain environment could become real-time, almost entirely automated, and highly efficient.

Fifth: Similar opportunities exist for work comp indemnity payments.

Using blockchain to validate indemnity payments for qualified work comp claimants could bring additional efficiencies for the pool, the public entity employer, and the injured worker. Even state reporting agencies could benefit from blockchain, making indemnity transactions and regulatory reporting completely seamless and real-time between all involved parties.

And so on.

There are many possibilities upon implementation of a DLT, like blockchain, within the public entity pooling environment. The pool's work comp excess insurers could utilize blockchain, with adaptation of self-insured retentions and premiums, accordingly. There could be other efficiencies related to medical payments, pharmacy benefits, and more. And there are certainly opportunities within other coverage areas – liability, property, health, disability, or even life insurance benefits.

Public entity pool considerations

The scenario offered here is merely an example of how or where blockchain, or any other DLT, might be implemented within a public entity pooling environment, and benefits that might be derived as a result. Public entity pools stand to gain a lot through implementation of this sort of technology and must also be mindful about impact of this technology being introduced through other forums.

So consider:

- If your business partners start operating using blockchain or similar technology, will your pool be able to adapt and capitalize on the embedded operational efficiencies?
- What changes would your pool make if your regulatory agency (or your excess or reinsurers) required access to information and transactions using DLT?
- What sort of services could you consider to more closely align your members to the pool, using blockchain or similar technology? For instance, should your pool be looking to introduce and integrate payroll blockchain tools as a member service to help your member entities with a common pinch point, as well as streamline your own operational practices?
- What if a competitor to the pool (whether current or new) offers this sort of streamlined process to your members? Are you prepared to compete against a process that greatly eases your members' reporting and tracking burdens?
- If blockchain reduces the need for intermediaries, what other common pool or public entity intermediary relationships could be at risk? How could the pool, itself, face member retention risks if it was perceived as an intermediary?

- How does your pool scan for new technology tools and trends, like blockchain, and determine where you want to fall on the spectrum of adoption?

- Who in your pool is charged with thinking about usefulness and timing of new technology implementations and how is that person staying up-to-date with possibilities and changes? How is that person connected to business partners and regulators, who might be considering new technology requirements?

There are also important privacy issues that require further evaluation and exploration, especially in a public entity forum. In a shared ledger environment, parties to the transaction have equal access to data. Tokens can be used to preserve identities while a chain is open, but the ledger and data are still accessible to both parties. Blockchain as a shared ledger probably presents no greater security risk than sharing public data with a clearinghouse or intermediary resource – but it's still a question worth considering.

Whether your pool operates primarily using manual computing processes, data processing systems that are completely functional but not cutting edge, or state-of-the-art technology, there will continue to be shifts and changes that impact your operations. In that way, there's more in common between public entity pooling and rocket science than you might think.

Advancements in technology: Consider more than blockchain

This issue of *Intelligence* explores a use-case for blockchain within a workers' compensation public entity risk pool. But, blockchain (or DLT) is just one of several technologies worth watching. Here are a few others your pool might want to monitor:

- **Robotic Process Automation (RPA).** RPA is a technology adaptable to repetitive processes with defined parameters that might otherwise be prone to human error. Say your pool has a certain field of claim data that has to be reported to a regulator each month, or a data element members have traditionally emailed for re-keying into a claims or underwriting system. Both these tasks would be candidates for RPA, also known as software robotics.

  The beauty of RPA is that it consistently performs manual, repeated tasks free from error and can be implemented with legacy systems. If you have a system conversion or integration underway where data has to be entered from a legacy system into a new configuration, RPA could be the key to quickly, efficiently, and effectively transferring data.

- **Chatbots.** You might think of a chatbot like a really robust, technology-enabled FAQ. Take every question you can possibly imagine your members asking about coverage or resolution of claims, and imagine the answers delivered by a chatbot mimicking a human at the other end of a text message.

  Chatbots are specific to messaging apps and are defined by their language processing and sentiment analysis abilities. Sophisticated chatbots might engage Artificial Intelligence or machine learning, but even a simple chatbot can pick up on key words and deliver member responses that would be hard to distinguish from a live pool representative.

- **Artificial Intelligence (AI).** AI is a global term used to describe underlying capabilities of everything from robots to autonomous vehicles, predictive analytics, and next generation electronic babysitters.

  AI is the ability of technology to find patterns and meaning in behaviors. AI is how Facebook knows to promote certain advertisements to you based upon your Internet search habits, friends, shopping and browsing behaviors. AI powers marketing by Amazon, Apple, Google, and more.

  Most discussions about AI in insurance focus on the member experience (making every member feel important and connected), claims processes to streamline interactions and increase efficiency, and assessing risks to perform underwriting in a more methodical and data-driven way.

- **Machine learning.** If you want to geek out further on AI-related possibilities, look into machine learning. In a machine learning environment, computers can take the

data and understanding derived from AI and interpret, anticipate, or predict what will happen next. The machine itself understands how to learn versus being programmed to interpret information.

The most talked about application of machine learning within traditional insurance is fraudulent claim detection – the ability of a machine to pick up on red flags that might otherwise be overlooked. Fraud tends not to be a major concern among public entity pools, but imagine how machine learning might impact your pool's investment manager relationship and investment policies.

Of course these technology descriptions and potential value of implementation within public entity pools have been greatly over-simplified for sake of brevity. The key point is that your pool might wish to explore these technologies and be prepared for the challenges and opportunities they offer.

About the Author

As executive director, Ann Gergen oversees operations, governance functions, and member service delivery for the Association of Governmental Risk Pools.

Ann routinely communicates and collaborates with the more than 200 pools that participate in AGRiP, and with the service providers who help pools sustain their operations. Ann has 25 years of direct public sector employment and experience in local government management, emergency services, risk management, primary and reinsurance claims, pooled insurance services and operations.

Ann is a recognized resource in strategic management and operations of public sector pools. She sits on several Boards of Directors, holds a Master's Degree in Public Administration, and is an attorney licensed in the State of Minnesota.

The Association of Governmental Risk Pools (AGRiP) energizes the power of pooling, making member organizations more effective, collaborative, and informed. AGRiP represents and connects all pooling organizations while providing education and resources to its members. AGRiP brings the brightest minds and ideas together to help make pooling successful.