EOSwitness.io

A 21st-century career management tool powered by the blockchain

ABSTRACT

From Deloitte's 2018 Global Human Capital Trends report[1]:

From careers to experiences: Rather than an orderly, sequential progression from job to job, 21st-century careers can be viewed as a series of developmental experiences, each offering the opportunity to acquire new skills, perspectives, and judgment.

The workforce ecosystem: The composition of the workforce is changing dramatically. As alternative work arrangements become more common, how can organizations appeal to, engage with, and drive value through workers of all different types?

In this paper we propose to lay out the case for an easy-to-use blockchain-based tool which will enable workers, whether they be employees, contractors, freelancers or gig workers, to own and control the insights about their developmental experiences over the course of their career.

Background

The human capital ecosystem marketplace accounts for an estimated $1 trillion in annual global spend[2]. The products and services that define the ecosystem are largely focused on the sourcing, developing, and deploying workers to create business value.

Human capital can be viewed as the collective capabilities and competencies of workers, and much of the ecosystem investment is spent on solutions focused on a) *Recruitment* (recruiters, staffing agencies, job boards, background checks and supporting systems), b) *Learning* (skills training, leadership development, testing, and supporting systems), c) *Performance Management* (ratings, calibration, coaching, and supporting systems), d) *Deployment and Scheduling* (time and attendance, worker scheduling, global mobility, and supporting systems), and e) *Total Rewards* (compensation, benefits, payroll, and supporting systems).

Neither the employers nor the workers, especially those leveraging alternative work arrangements, feel that they are particularly well-served by today's often disintegrated and employer-centric human capital solutions[3], and the gap at the center of this dissatisfaction is often a misalignment between worker passion and employer purpose. From a purely human perspective, if the worker is not engaged in the employer's mission, the extrinsic factors targeted by HR processes, policies, and enabling technologies will be irrelevant at best, and gamed at worst.

The individual's journey to discover their unique worker identity, that intersection of activity that is both personally satisfying yet also results in the creation of marketplace value for potential employers, is an

[1] Deloitte, "2018 Global Human Capital Trends, The rise of the social enterprise", *Deloitte Insights,* April 2018
[2] HRmarketer.com 2015 study estimates spend of $785 billion in benefits plus $133 billion in other HR services
[3] Smith, Dave, "Insights from the 2017 Human Capital Technology and Service Provider Day", June, 2017

ever-evolving lifelong pursuit. Core to this discovery process is that ability to test ones beliefs about ones capabilities and competencies against the feedback of trusted colleagues in the context of real world situations.

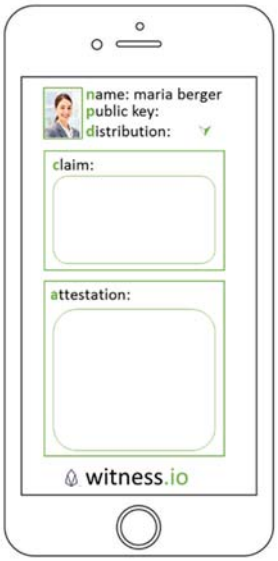
The balance of this paper will discuss our vision for a decentralized mobile application, witness.io, that puts workers in control of that trusted colleague feedback loop, and positions them to better understand how to maximize their unique contribution in this 21st-century world of work.

Why decentralized?

For each of the human capital technologies mentioned above (e.g. recruitment systems, learning and training systems, performance management systems, compensation, benefits, and payroll systems, etc) worker data is collected and managed at the employer level. Information about the worker is maintained as long as the worker is employed, but is rendered obsolete when the worker departs. This is especially problematic because 50 percent of the respondents in this year's Global Human Capital Trends survey reported a significant number of contractors in their workforces; 23 percent reported a significant number of freelancers, and 13 percent reported a significant number of gig workers[4].

Of course, there are centralized solutions that track worker capability and competency information in a way that spans employers (e.g. Facebook, LinkedIn, Upwork, etc.). However, these 3rd party platform solutions rely on business models which monetizing worker data via advertising and/or selling the information to recruiters and other interested parties. These solutions are also vulnerable to data hacks and provider-specific business disruptions, mergers & acquisitions, and shifts in business strategy.

The new breed of blockchain platforms (e.g. EOS, Cardano, Stellar, NEO, etc.) allow, for the first time, the development and deployment of decentralized applications that meet our key requirement for a solution designed around the needs of the worker, and which empower the worker to own and control the data about themselves through their entire career.



The witness.io dapp

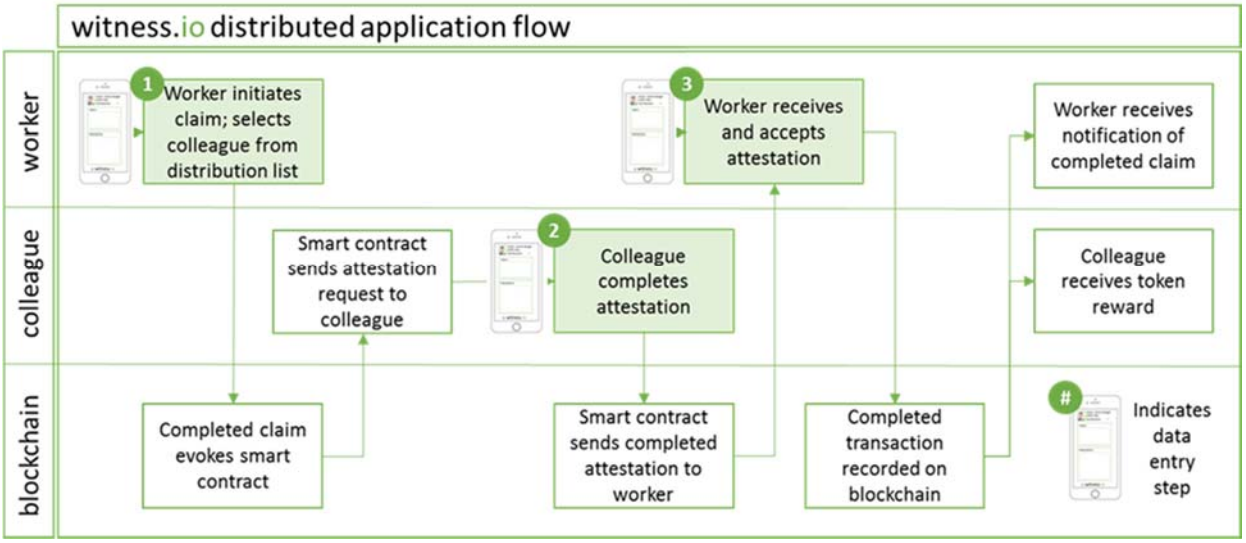
The witness.io decentralized application (dapp) is designed with the goal of putting the worker back in control of their workplace identity and the Claims, Proofs and Attestations (see section below) that support their understanding of how they fit into and ever-changing world of work.

It is an easy-to-use mobile application that allows workers to make Claims about their identity, education credentials, employment history, capabilities, and competencies, and then, with one touch, request Proofs and Attestations from credentialing bodies, previous employers, or trusted colleagues. Both the original Claim and the Proofs or Attestations, once verified by the worker, will then be secured on the blockchain.

Because the worker is the owner of their unique career identity, nothing is added to the blockchain that is not co-signed with their private key. When a colleague responds to a request to witness to a Claim (e.g. "In this project

[4] Deloitte, "2018 Global Human Capital Trends, The rise of the social enterprise", *Deloitte Insights,* April 2018

I have demonstrated mastery level of the C++ programming language"), the worker always has the right to have a particular witness Attestation (e.g. strongly agree, agree, strongly disagree) added to their blockchain account, or not.



Self-sovereign career identity

Who are you? And who decides you're really you and can be trusted? The answer, and the systems involved, differ in the real world and online. But blockchain technology could make establishing identity and trust much easier for everyone.[5]

In the context of the witness.io, we take the self-sovereign identity concept even further. The worker owns and controls the information about their career identities, and is able to maintain multiple *personas* to reflect different interest profiles or career stages.

Take, for example, the mathematician who is also a musician. The witness.io dapp enables this individual to maintain separate career personas under their account for these two very different careers, while maintaining complete control over which profile is exposed to whom, when.

Claims, Proofs and Attestations

While the terms "claim", "proof" and "attestation" have more or less formal definitions in the self-sovereign identity literature, we will limit our comments to how they will be used in the witness.io dapp.

Claim- the worker asserts something about their experiences, capabilities or competencies. As mentioned above, this may include tangible facts such as previous employer or something more subjective, for example, an ability to discover innovative solutions to intractable problems.

Proof- some form of documentation that provides evidence for the claim. For a more tangible Claim, the Proof may be include photocopies of passports, birth certificates, diplomas, professional certifications or reference letters. Even for more subjective Claims such as our innovation example

[5] Windly, Phillip, "How blockchain makes self-sovereign identities possible", Computerworld, Jan 2018

above, the worker may elect to provide a personality assessment tool (e.g. Deloitte Business Chemistry) even though such a document is not technically a 'proof' of the Claim.

Attestation- while this term is typically reserved for when a third party validates that according to their records, the worker's claims are true, the witness.io dapp will use it in the broader sense of trusted colleague anecdotes, examples, and testimonies that support (or refute) the Claim. So for the tangible Claim example, the attestation may just be the third party's validation of the Proof (University confirming via their cryptographic signature that the worker's diploma is legitimate) but for the more subjective Claims, Attestations provide context and support (or lack thereof) for the Claim.

Claims, Proofs, and Attestations provide the organizing structure of the witness.io dapp. All witness data requested, collected, validated, and written to the blockchain, begins with a worker Claim. Some Claims may have Proofs, yet many may not; but most Claims, even about the most subjective of topics should have at least several Attestations of support.

Several example use cases are included in the table below:

Table 1. Claim, Proof, and Attestation examples

Claim	***Proof***	***Attestation***
"I am an expert C++ programmer"	Link to a GitHub repository with my work	Examples from colleagues and clients of my programming accomplishments
"I was employed by PepsiCo from 1991 to 1996"	Employment confirmation document provided by PepsiCo HR	PepsiCo HR department private key signature on the employment confirmation blockchain transaction
"One of my key strengths is my ability to collaborate in teams"	Deloitte Business Chemistry summary document showing an orientation towards "Integrator"	Multiple witnesses attesting via personal anecdotes about how I added value to teams
"I am a talented writer of business articles"	Links to publications or blog posts I have authored	Qualified professional colleagues attesting to my writing skills demonstrated in various contexts over time
"I am an accomplished and certified Workday Project Manager"	Link to my Workday Project Manager certification	Colleague and client testimony about my track record of delivering Workday projects on-time and on-budget
"I enjoy supporting the professional growth of my more junior colleagues"	N/A	Multiple testimonies from junior colleagues that have benefited by my mentorship

Token-based Incentives

While we believe that each of the stakeholders involved in the witness.io dapp decentralized workflow will derive both short and longer term benefit from the outcomes associated with worker control of their online career identities, a witness.io token will be used to align and incent behaviors that are deemed to add value to the ecosystem.

In its simplest form, it is easy to see that while workers themselves may have sufficient interest in their own careers to initiate Claims without token incentives, it may help motivate requested witnesses to respond in a thoughtful way if they were to earn tokens should their Attestation in response to a Claim be accepted by the worker and added to the blockchain. (See the witness.io application flow.)

The behaviors that will earn witness.io tokens, as well as the enhanced application features available to those with tokens to spend, will be determined during the witness.io dapp detailed design stage, but it is important to appreciate that alignment of stakeholder incentives is a critical success factor for any decentralized application, and tokenization of exchangeable value is the powerful new tool blockchain technology provides to help make that happen.

Blockchain Technology

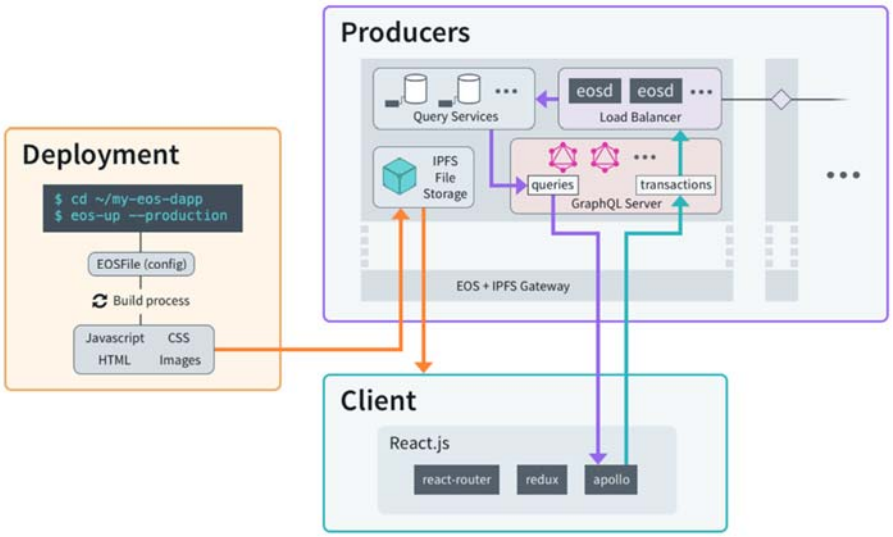
As mentioned above, there are a number of competing initiatives aimed at creating application infrastructures for blockchain-based distributed applications. While we are essentially technology agnostic and want to remain flexible given the fast-moving nature of this industry, for the purposes of this paper we reference EOS.IO, an open source software solution developed by block.one.

On their website, EOS.IO is billed as: "The most powerful infrastructure for decentralized applications" and claims the following differentiating capabilities that address some of the most vexing blockchain limitations to-date:

Scalability: Supports thousands of commercial distributed applications, inter-blockchain communication, and the separation of authentication from execution

Flexibility: freeze and fix broken applications, generalized role-based permissions, and support for the emerging industry standard of Web Assembly

Usability: Web toolkit for interface development, self-describing interfaces, and declarative permission scheme



EOS.IO schematic:

Block producers of the network provide bandwidth, IPFS storage, query services, servers, and gateway interfaces. They are incentivized to do this through newly minted EOS tokens, similar to how Bitcoin miners are incentivized to provide SHA256 hashing services to the network through Bitcoin block rewards. Users (clients) then connect to services made available by

block producers similar to using classical internet services. Since there are multiple block producers, there is a distributed entry point to all software on the EOS.io network unlike classical centralized web applications.[6]

One key advantage this new generation of blockchain platforms provides to the application developer is the use of familiar programing tools to create blockchain smart contracts (e.g. C++), as well as build client facing applications (JavaScript, HTML, Web Assembly, etc). These new capabilities will put blockchain application development within the reach of traditional IT shops with a minimum of specialized training.

Disrupting the Human Capital Ecosystem

We began this paper by discussing the current state of the human capital ecosystem, with its disintegrated solutions that do not provide worker value beyond the term of a specific employer/worker relationship.

Ironically, putting the worker in control of the data about themselves via the blockchain is likely to better serve the enterprise in the long run, especially when considering increasingly aggressive data privacy laws and the ever-present danger of centralized Personally Identifiable Information (PII) database hacks. And that does not even include the reduced expense and aggravation associated with activities such as background checks.

Assuming the witness.io dapp gains traction in the marketplace, here are several potential human capital ecosystem disruption opportunities we envision:

Table 2. Ecosystem disruption opportunities

Recruitment (staffing agencies, job boards, recruiters, background checks, and supporting systems)	Potential employers query the Witness blockchain seeking valued capability and competency profiles; candidate 'hits' result in automatic integration of blockchain data with enterprise applications once worker permission is secured
Learning (skills training, leadership development, certification testing, and supporting systems)	Successful completion of an enterprise learning module would trigger a Claim to the workers Witness profile; Instructors may be requested to provide additional Attestations to the worker's performance in the course
Performance Management (rating and calibration processes and supporting system)	Worker owns the process, seeks colleague feedback via Witness, and follows up with coaching requests; employer query's the Witness blockchain for worker performance data which is used to drive the performance conversation
Deployment and Scheduling (time and attendance, global mobility programs, and supporting systems)	Line managers query the Witness blockchain seeking needed skills; project and role assignments are updated as worker Claims with project managers providing Attestation of actual time spent and objectives accomplished
Total Rewards (compensation, benefits, payroll, and supporting systems)	Changes in compensation or benefits earned would be updated as Claims on the worker's Witness blockchain; where feasible real-time or cross-border payments for gig or freelance work can be handled via cryptocurrency

[6] EOS.IO website, April, 2018

Human capital ecosystem opportunities

So what is the incentive for human capital ecosystem participants to cooperate in the development and deployment of the proposed witness.io dapp? What is the commercial model for product or service provider if clients and their candidates to use this distributed platform? We see five key opportunity areas:

1) Serve as a third party endorser of factual Claims about critical identity data or areas that background check surveys reveal tend to be problematic (e.g. previous employer job titles and final salaries, academic degrees, etc.)
2) Consult around the design, build and deploy of a new generation of human capital enterprise applications that will require API-level integration with worker blockchain data
3) Provide eminence leadership in the blockchain-for-human-capital space with demonstrable evidence that we understand the unique combination of disciplines required to design and deploy ecosystem-wide decentralized human capital applications
4) Gain credibility and build engagement with their own workers, especially the social media-savvy generation increasingly frustrated with the ways the data about them is being used (and abused) by today's centralized platform providers
5) Build out their own alternative work structure ecosystem of contractors, freelance, and gig workers by providing a way for them to own and maintain the critical data about their capabilities and competencies throughout their careers

Conclusion

In this paper the author has laid out the case for a blockchain-based decentralized application, witness.io, which would enable workers to own and control the insights about their developmental experiences over the course of their career.

If you have questions about this paper, please contact the author at daniel.john.roddy@gmail.com.