



Velocity Network Foundation Explains

Verifiable credentials in education

Many great articles, white papers, and research documents have been written in the last couple of years about verifiable credentials and their value in education. This short document summarizes the main points of a few of the best ones and includes extracts of the key content and messages in each. This particular summary has been tailored to explain how Velocity-empowered credentials enable opportunities for organizations and individuals.



June 2023

VERIFIABLE CREDENTIALS AS A SOLUTION FOR TRUST

Over the past few decades we have become accustomed to using digital credentials. The paper-based credentials of prior decades—tickets, transcripts, certificates—that we once carried in our pockets can now be carried on our smartphones and produced or copied on demand.

These digital credentials, even more so than their physical counterparts, can be easily altered or stolen. As a result, while the typical digital credentials may be convenient, they are also quite unreliable. The lack of trust that we have in most digital representations of credentials undermines their utility in important situations.

As a solution, verifiable credentials are emerging to solve many of the problems traditionally encountered with digital and even physical credentials. A verifiable credential represents the same data as a physical credential, but the use of additional cryptographic technology makes verifiable credentials more trustworthy, secure, and tamper-evident than their digital or physical counterparts.¹

Experts highlight that unlike a digital copy, verifiable credentials enable holders to easily share their credentials, while also enabling receiving parties to easily confirm the legitimacy of the shared credentials. Specifically, verifiable credentials offer proof that:

- the credential has been issued by a trusted authority,
- that it was issued to, and only to, its holder,
- that the credential has not been altered or tampered with, and
- that the credential has not been revoked or expired.

In addition, this exchange of information can be transacted almost instantaneously, “making them more convenient than their physical counterparts when trying to establish trust at a distance.”² Resultantly, the advent of verifiable credentials produces a number of benefits for consumers, businesses, institutions, and governments.

VELOCITY-ENABLED VERIFIABLE CREDENTIALS

It is important to note that verifiable credentials alone do not produce a full solution to trust. Verifiable credentials are a vehicle that enables trusted exchange of data, but these credentials must be anchored and supported by an ecosystem where trust can be rooted. Networks, like that of the Velocity Network Foundation, provide ecosystems where diverse and unrelated participants (organizations that issue credentials, data processors that convert traditional data into verifiable credentials, individuals that receive and use the data, and organizations that verify and rely upon data to make decisions) can trust one another. Trust is created by the requirements and governance that the network places upon participating entities.

To elaborate, Velocity Network Foundation brings global standardization on critical aspects necessary for trust to be maintained among participants in verifiable credentials data exchanges:

- organization registration via “know your business” processes
- governance of how identity credentials are issued
- requirements for key handling best practices
- requirements for legal assurances
- a solid governance structure for overseeing network participation

¹ M. Sporny, D. Longley, and D. Chadwick, “Verifiable Credentials Data Model v1.1,” 2022, <https://www.w3.org/TR/vc-data-model/#references>.

² D. Hardman, “A Gentle Introduction to Verifiable Credentials,” 2022, <https://www.evernym.com/blog/gentle-introduction-verifiable-credentials/>.

Together, these components of the network enable checks on participants that truly build trust in the verifiable credentials, enabling trusted transactions between unrelated parties without a broker or other centralized party.

The Velocity Network Foundation enables verifiable digital credentials to have global reach—working on multiple layers of interoperability: technical, structural, semantic, legal/regulatory, and business process. This comprehensive view of interoperability ensures that different types of credentials and credentialing technologies can all be used by organizations and individuals interchangeably, that credentials can cross geographic and domain boundaries, and that no one entity is boxed out of fair participation in the verifiable credentials ecosystem. In addition, Velocity protocols enable credentials to be supported by contextual information, using the work of contributors that organize data to explain what exchanged credentials actually mean.

Velocity-enabled credentials are supported and governed by a nonprofit (Velocity Network Foundation) that oversees the network and organizational behaviors on the network. Both the network and its governance are fully decentralized, so that no one entity ever controls the network or its governance processes. Individuals do not have to fear a single entity recapturing control over their data, and organizations do not have to fear a competitor organization leveraging unfair business practices to dominate the network.

The following brief discussion will highlight some of the benefits resulting from the use of Velocity-enabled verifiable credentials within the education sector.

BENEFITS OF VERIFIABLE CREDENTIALS IN EDUCATION

The use of verifiable credentials in educational contexts can provide several benefits by automating workflows, improving trust and accountability, increasing security, reducing fraud, and driving administrative efficiencies.³ These immediate benefits allow for secondary benefits of cost reduction for institutions and employers, greater opportunities for individuals, and reduced bias in admissions and hiring decisions.

Increasing Trust in Credentials

As people increasingly mistrust institutions and have concerns about data fraud, verifiable credentials are one critical measure that helps reestablish trust in digital identity and credentials, particularly in cross-border situations.⁴ Tamper-proof credentials enable inspectors, such as institutions of higher education or employers of recent graduates, to confidently use data that is shared with them by individuals. In addition, verifiable credentials enable individuals to be in control of their own data, storing credentials in their selected digital wallet and sharing them only with entities of their choosing. Thus, Velocity's use of decentralized blockchain technology in enabling verifiable credentials solves the trust issues of both the holder and the verifier.

Mitigating Risk of Data Breaches

Repercussions of data breaches are massive—both to the institutions and to the individuals whose data is compromised.⁵ In addition to direct costs, the consequences of a data breach undermine individuals' trust in the institutions whose data was hacked.

Velocity-enabled verifiable credentials make it harder to steal data. When verifiable credentials use cryptographic proof of their legitimacy, the Velocity blockchain network decentralizes the data by enabling

³ *Ibid.*

⁴ P. Schwartz, "What Are Verifiable Credentials? And How Can They Build Digital Trust?", 2022, <https://www.salesforce.com/blog/verifiable-credentials/>.

⁵ D. Hardman, "A Gentle Introduction to Verifiable Credentials," 2022, <https://www.evernym.com/blog/gentle-introduction-verifiable-credentials/>.

the storage of credentials in an individual's wallet; only the proof of the credentials' legitimacy is stored on chain. In a truly self-sovereign model, like Velocity, no personally identifiable information (PII) is stored on chain.

By its nature, the distributed ledger technology of the Velocity blockchain network decentralizes data storage and reduces the incentive for hackers to break into a centralized store of data to steal private information. Without a central data store, a hacker would essentially have to go one by one to access thousands of individual records, as opposed to conveniently hacking into a single centralized data store to obtain access to those same records. The benefits of decentralized data via Velocity's blockchain-enabled verifiable credentials are attractive to both individuals and institutions from the perspective of data security and risk mitigation.

Accelerating Verification of Requisite Skills and Credentials

From a process standpoint, Velocity-enabled verifiable credentials automate the process of sharing and verifying credentials. The Velocity credential agent (CA) is free and open source, readily available for any entity wishing to issue or inspect credentials. By providing the CA technology, Velocity aims to increase the number of Human Resources and Student Information Systems that are natively able to issue and inspect credentials, thereby facilitating exchange and automatic verification. Automated verification dramatically reduces the time required to share individual credentials and achieve validation by an institution or employer.

In the education context, this automation and resultant time reduction has enormous benefits—for example, rather than having to mail in copies of transcripts and wait for an entity to verify that the credentials are legitimate, verifiable credentials processed via Velocity-enabled systems of record will allow this process to be near instantaneous. These automated transactions help in several important educational contexts:

- **Streamlining the Admissions Process.** Rather than having to complete extensive forms and then have the credential data on these forms manually verified, individuals can share their credentials directly from their wallets with the receiving institution, and that institution can immediately confirm their validity. This will accelerate an expensive and time-consuming step in the admissions process.⁶
- **Simplifying the Credit Transfer Process.** As individuals move between institutions and need to transfer credits earned from a prior institution, verifiable credentials can streamline this process by enabling an individual to select from their wallet which credentials they want to share with the admitting institution; once shared, the receiving party can immediately verify their legitimacy and intake the set of credits from the former institution.⁷
- **Enabling Transition into Employment.** Background checks can take weeks or even months to validate the requirements for an individual's employment. Using verifiable credentials, employers can instantly verify qualifications and more quickly hire and onboard new employees based on trusted and instantly verifiable credentials. This will improve the speed at which graduates are onboarded into their next opportunities.

In addition, it enables the issuing schools to achieve more integrity in their credentials—no longer will impostors be able to make false claims of having attended an institution or achieved a particular credential. Velocity-enabled verifiable credentials will make the truth about an individual's identity and achievement transparent to all, enabling the issuing institution to be accurately recognized by employers for the quality of graduates it produces.

⁶ Digitary, adapted from "Verifiable Credential Use Cases in the Education Sector," 2022, <https://www.digitary.net/verifiable-credential-use-cases-in-the-education-sector/>.

⁷ *Ibid.*

Enabling Learner/Worker Achievement

Velocity-enabled verifiable credentials also present several important benefits directly to the learner-workers that hold the credentials.

- **Increasing Learner Agency.** Many education and training organizations seek to better define education and career pathways to help learners navigate their learning journeys and achieve better outcomes. Skill frameworks are critical to enabling learner agency, in that individuals need to understand the learning requirements and skill progressions for achieving particular goals. Aligned microcredentials encourage lifelong learning by enabling individuals to create flexible, personalized learning pathways.⁸

Verifiable credentials help support articulated skills frameworks by reinforcing the structure of learning pathways and by incenting and rewarding learners along their journeys. Learners will be able to collect and curate assertions of their skill sets and use them to pursue further education or to gain employment opportunities, including those that require cross-border mobility.⁹ Velocity's network and governance structures are specifically and uniquely designed to enable this necessary global mobility.

- **Enabling Compilation of an Individual's Credentials.** Learner-workers collect numerous credentials in various forms over the course of their learning and employment careers. At present, these credentials are stranded on islands subject to vendor lock-in and network boundaries. The individual may not have full control over their credentials to enable portability and aggregation of their own data.

Verifiable credentials supported by Velocity's decentralized self-sovereign blockchain technology enable each user to aggregate their credentials in their chosen digital wallets. This enables the individual to better discern learning progressions, learning gaps, and opportunity matches. Individuals will be able to disclose their curated credentials to organizations that will provide greater insights to feed their interests, motivations, and goals. In parallel, institutions will be able to offer more refined and personalized learning experiences.¹⁰

- **Increasing Student Return on Investment.** Verifiable credentials in the form of microcredentials will be a tremendous asset to individuals who for various reasons fall short of obtaining a four-year degree. College attendance is on a decline,¹¹ and individuals from disadvantaged communities often abort their pursuits of higher education for financial reasons, family stressors, and inadequate preparation, among other reasons.¹² As an alternative, microcredentialing approaches offer more affordable academic options that lead to greater economic mobility and a better return on investment for learners.¹³

⁸ T. Hunt, R. Carter, L. Zhang, and S. Yang, "Micro-Credentials: The Potential of Personalized Professional Development," 2020, *Dev. Learn. Organ.* 34, 33–35. doi: 10.1106/DLO-09-2019-0215.

⁹ *Ibid.*

¹⁰ *Ibid.*

¹¹ J. Anderson, "How America Started to Fall Out of Love With College Degrees," 2023, <https://time.com/6265266/america-college-degrees-essay/>.

¹² B. Platz, "Expanding Educational and Workforce Opportunities with Verifiable Credentials," 2022, <https://www.forbes.com/sites/forbestechcouncil/2022/08/19/expanding-educational-and-workforce-opportunities-with-verifiable-credentials/>.

¹³ M. I. Brownlee, "The Power of Microcredentials and America's Higher Education Dilemma," 2023, *EdSurge*. <https://www.edsurge.com/news/2023-03-23-the-power-of-microcredentials-and-america-s-higher-education-dilemma>.

Verifiable credentials present a way for non-degreed individuals—those who have honed their skill sets but not obtained a summative degree—to collect, curate, and demonstrate their capabilities to employers. In addition, previously obtained credentials may be communicated to other institutions and leveraged to enable the individual to eventually finish their education. For example, CAEL reports, “Overall, adults who earn credit for prior learning are 17% more likely to graduate than adults who do not.”¹⁴ In this way, verifiable credentials help learners persist and therefore are also a mechanism to increase equity. Velocity Network Foundation promotes the use of microcredentials, which supports this desired future of equity.

- **Enabling Diversity and Increasing Access.** Skills-based admissions and hiring are opportunities to create equity and transparency. Velocity-enabled verifiable credentials support equitable practices by enabling an individual to receive, store, curate, and present credentials that better articulate their skills and abilities than would a diploma or four-year degree. This becomes a tremendous asset to individuals from disadvantaged backgrounds or who possess specific disabilities. Such students often encounter financial or personal issues during their course of study, causing them to abort their educational pursuits prior to earning traditional diplomas.

In supporting a skills-based economy and educational system, verifiable credentials enable a broader set of people to better communicate their skills and abilities that they have acquired, rather than relying solely on a summary statement about what institution they attended and their graduation status. This approach similarly applies to individuals with disabilities, who may not be able to achieve all measures of success but may be able to focus on developing a few specific and relevant skills.

Using a skills-based approach enabled by verifiable credentials allow individuals to better showcase their skills and be matched to future education and employment opportunities on equitable terms.¹⁵

- **Connecting Learners to Employers.** Institutions of higher education are rated based on their ability to place students after graduation.¹⁶ Currently, the limited number of credentials that students earn reside in closed ecosystems in which the credentials cannot be shared with an outside institution or employer to transition to the next opportunity.

Velocity-enabled verifiable credentials will broaden the utility of existing and newly issued credentials, enabling students to transition easily into next-level educational pursuits, fellowships, or careers. As the adoption of Velocity-enabled verifiable credentials expands, employers will be able to consume and instantly verify a students’ credentials, while also promoting trust and protecting such digital exchanges from fraud. As a result, postgraduation placements will become seamless, and institutions will achieve better results on their own placement metrics.

Reducing Biases

When students join the workforce, Velocity-enabled verifiable credentials help them provide trusted evidence that they are qualified for the opportunities that they pursue. Employers and other institutions will gain more granular and meaningful information about what a candidate has achieved and can do. As verifiable credentials produce a transparent presentation of the individual’s knowledge, skills, and abilities, they shift the focus to those credentials and away from personal attributes that may drive systemic discrimination.

¹⁴ “Home page,” The Council for Adult and Experiential Learning (CAEL), “What is Credit for Prior Learning (CPL)?” 2023, <https://www.cael.org/ip/cpl-pla>.

¹⁵ *Ibid.*

¹⁶ A. White, “Experts View Rating Universities by Graduate Employment Prospects,” 2010, <https://www.theguardian.com/careers/careers-blog/experts-view-rating-universities-by-graduate-employment-prospects>.

In addition, Velocity’s self-sovereign blockchain technology puts the control of one’s credentials entirely in the hands of the individual. This empowers people to self-represent to new opportunities—rather than having to deliver a full transcript, which may or may not include revealing data on one’s socioeconomic status or other personal attributes. Self-sovereign verifiable credentials help enable individuals to curate and share only information that is relevant to obtaining specific opportunities.

In general, a skills-based approach enabled by verifiable credentials mitigates the risk of decision-making based on our unconscious biases, and thus promotes greater equity in the admissions or hiring process. Thus, verifiable credentials should alleviate bias against underrepresented groups and support a more egalitarian labor market.¹⁷

SUMMARY

Taken together, these benefits may make verifiable credentials the centerpiece of the greatest workforce transformation since the Industrial Revolution. It is believed by many that verifiable credentials will enable us to achieve our goals for trust, privacy, security, interchangeability, and opportunity at scale. Velocity has built its decentralized network based on that belief, and it encourages all institutions to put data back in the hands of individuals and enable critical transformation of the education sector.

Experts promote that given this desired future, key requirements for a global infrastructure include the need to prioritize learner agency and privacy, enable trust, and support diverse use-cases and technology best practices.¹⁸ It is critically important that institutions, organizations, and employers build upon and adapt current technologies in ways that promote a fully interoperable and trusted global skills marketplace so the education sector can achieve the promise of verifiable credentials.

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¹⁷ B. Platz, “Expanding Educational and Workforce Opportunities with Verifiable Credentials,” 2022, <https://www.forbes.com/sites/forbestechcouncil/2022/08/19/expanding-educational-and-workforce-opportunities-with-verifiable-credentials/>.

¹⁸ Digital Credentials Consortium, “Building the Digital Credential Infrastructure for the Future,” 2020, <https://digitalcredentials.mit.edu/wp-content/uploads/2020/02/white-paper-building-digital-credential-infrastructure-future.pdf>.