



Blockchain Center of Excellence Case Study Series

Re-inventing Talent Acquisition: The SmartResume® Solution

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by Mary Lacity, director of the Blockchain Center of Excellence

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Walton College professor and director of the Blockchain Center of Excellence

Abstract: *Talent acquisition remains a process wrought with fraudulent claims by applicants, selection bias by hiring firms, and data privacy violations by platforms and recruiters. The SmartResume solution, developed by iDatafy, establishes a trusted platform for talent acquisition based on verified credentials that are secured with blockchain technology. The platform masks personal data to eliminate selection bias and ensures privacy protection and regulatory compliance. Although some people focus on the SmartResume's underlying blockchain technology as its distinguishing feature, the success of the solution is based on how iDatafy convened a consortium of credentialing organizations, hiring companies, and individuals. This Blockchain Center of Excellence (BCoE) case study covers the development of the solution over an eighteen month period and offers general lessons for this and other types of ecosystem solutions.*

1. Talent acquisition challenges

Despite all of the advanced Human Resource (HR) practices, investments, and technology innovations, we have yet to solve adequately this talent acquisition problem: ***How can we create a trustworthy job market that efficiently matches qualified job seekers with hiring organizations?*** Peter Cappelli, the George W. Taylor Professor of Management at the Wharton School and director of the Center for Human Resources, summed the challenge nicely in a 2018 Harvard Business Review article: “*Businesses have never done as much hiring as they do today. They’ve never spent as much money doing it. And they’ve never done a worse job of it.*”¹

Today’s talent acquisition solutions include hundreds of job market and social media platforms like CareerBuilder, Indeed, LinkedIn, and Monster. According to one study, social media is now the most-used channel for recruitment efforts: 77 percent of recruiters used LinkedIn in 2018, followed by Facebook (63 percent) and Instagram (35 percent).² While such solutions do have the advantages of convenience and scale, they equally frustrate job seekers and recruiters. Distrust happens on both sides of the market. Specifically, recruiters doubt applicants’ self-reported credentials and skills, while job seekers distrust that hiring companies and platforms keep their data private and select applicants in an unbiased manner. All of these misgivings are warranted.

Many applicants inflate their skills or make fraudulent claims on their resumes. Job sites and social media platforms do not verify credentials. Subsequently, fraud and inflated resumes remain problematic. A recent survey found that 75 percent of employers caught applicants lying on their resumes.³ One of the most common frauds is claiming a university degree that was not earned. One high-profile example: the CEO of Yahoo was ousted after someone uncovered that he had not earned the computer science degree he claimed.⁴ “Diploma mills” are another problem in the US, because they award degrees with little or no academic study.⁵ Consequently, hiring companies spend significant resources to investigate a job candidate’s claims. Verification slows down the process and increases costs. On average, it costs companies \$4,129 per hire,⁶

but costs can be as high as \$40,000 per position for highly skilled workers.⁷ Moreover, honest job applicants grow weary of the assumption of duplicity.

Hiring organizations and recruiters struggle with selection bias. Social media and many job site platforms reveal people’s race, gender, age, religion, affiliations, and life-style choices, and recruiters may (in)advertently dismiss candidates based on this data rather than based on their qualifications. Some large companies have turned to artificial intelligence (AI) to modernize recruitment, but so far results did little to reduce biases. For example, Amazon’s AI recruiting tool was designed to search for keywords based on past engineering candidates’ resumes. Since most engineers were male in the past, the AI tool learned to prefer male applicants. Amazon abandoned the tool after the gender bias was revealed.⁸ Social media, job site platforms, and AI tools are not the only sources of selection bias; relying on referrals from current employees creates a homogeneous applicant pool because people tend to refer people who are similar to them.⁹

Data privacy protection is another concern for all parties. Hiring organizations – particularly those 60 percent of companies that outsource recruiting – need to make sure applicant data is properly handled. In the US, for example, the Family Educational Rights and Privacy Act (FERPA) protects the privacy of student education records. Generally, schools must have written permission from the parent or eligible student before releasing any information about a student’s education record.¹⁰ Increasingly, data privacy regulations like the European Union’s General Data Protection Regulation (GDPR)¹¹ and California Consumer Privacy Act (CCPA)¹² have increased data protection more broadly. Despite these regulations, many job sites and recruiters routinely collect information on applicants like email addresses, phone numbers, age, ethnicity, photos, and other personal information.¹³

The scale of the job acquisition challenges is huge. According to the United States Department of Labor, there were 70 million job hires in the US in 2019.¹⁴ On average, there were 250 applications for each corporate job listing,¹⁵ suggesting that hiring organizations processed at least 17 billion applications. Furthermore, the process does not always end successfully; 6.4 million job openings went unfilled in 2019.¹⁶ Isn’t it time to re-invent job acquisition? iDatafy thinks so, and subsequently developed the SmartResume solution to restore trust in the job search process.

2. The SmartResume® solution

iDatafy, a company founded by David Wengel in Little Rock, Arkansas in 2011, created the SmartResume platform and career network to instill trust in the talent acquisition process. The platform prevents fraudulent claims by applicants, eliminates selection bias, and ensures data privacy compliance. The SmartResume platform is similar to LinkedIn or Upwork, but with *verified* credentials secured by blockchain technology. Wengel’s vision is to make the SmartResume platform, “*the world’s most trusted resume and certified career network.*”

To launch the career network, iDatafy focused on its home base in Arkansas. It assembled a consortium of credentialing organizations, individuals, and hiring organizations to help develop the solution. The pilot project launched with the first credentialing organization, the Sam M. Walton College of Business at the University of Arkansas, in 2018. Within 18 months, the consortium included the University of Arkansas System at Fayetteville; Little Rock; Fort Smith; Community College at Morrilton; eVersity and Pulaski Technical. A number of other higher education institutions outside the UA System have signed on as

well, with official announcements forthcoming. Here we describe the consortium, platform, development journey, competition, and lessons learned.

2.1 SmartResume consortium

iDatafy convened a consortium of credentialing organizations, individuals, and hiring companies.

Credentialing organizations are institutions that award credentials, such as colleges, universities, trade schools, professional associations, licensing bureaus, and government organizations. In the SmartResume platform, credentialing organizations create a SmartResume on behalf of an individual by certifying educational degrees, coursework, honors, activities, awards, experiences, licenses, affiliations, research, skills, reference letters, or other certifications. The certifications appear on an individual’s SmartResume as a tamperproof badge that is secured by blockchain technology (see Figure 1).



Figure 1: Example of SmartResume®’s certified badges

Each certification is secured on a tamper-proof ledger stored on a blockchain

As a key design decision, credentialing organizations choose the name and type of credential. This way, credentialing organizations gain value by promoting their brand. For example, the Walton College chose “Leadership Walton” as one of its credentials. Leadership Walton is a professional development program for undergraduate business students, offering them a unique blend of academic, leadership, and career development opportunities specifically designed to guide them toward lifelong professional success.¹⁷

By putting credentialing organizations in control, the SmartResume platform prevents users from claiming credentials they did not earn, thus protecting the organization’s brand. They also gain efficiencies by credentialing a person *once*, rather than re-affirming credentials every time a person changes employment. For educational institutions, an additional benefit of joining the SmartResume platform is that it serves as a meaningful way to connect with alumni. For workforce skill certifiers – such as organizations that train and certify truck drivers; steamfitters, pipefitters, sprinkler systems installers; and heating, ventilation, and air conditioning (HVAC) technicians – the platform provides better access for hiring companies to find qualified talent.

Individuals like students, alumni, current job holders, and job seekers cannot launch their own SmartResumes. Rather, a credentialing organization must do so on the individual’s behalf. However,

individuals must opt in to the SmartResume platform; if an individual does not activate their SmartResume, it is not accessible by any third party. Individuals who activate their resumes can supplement their personal SmartResume with additional information, such as career objectives, hobbies, and interests. Hiring organizations can ascertain which credentials were verified by credentialing organizations by the presence of the blockchain badge and which entries were added by individuals. Each individual gets one SmartResume, which may contain verified credentials from many different organizations. Individuals are in control of their job matching preferences, and may grant or deny full access rights to particular hiring organizations. Individuals do not have to pay to participate on the platform.

Hiring organizations include any institution searching for qualified employees. Hiring organizations (or outsourced recruiters) search for qualified candidates based only on their skills, as all demographic and personal information like name and gender are masked to prevent search bias. Figure 2 depicts a sample resume as it would appear to a hiring organization. If an organization is interested in connecting to an individual, the platform sends the individual an email request. Hiring organizations gain efficiencies by having a qualified applicant pool, and they no longer have to call each organization on a candidate's resume to verify credentials. Hiring companies pay to use the platform.

SmartResume®

A Resume You Can Trust.™

Employers

Education Institutions

Workforce Skill
Certifiers

Individuals

SmartResume

JOB APPLICANT IDATAFIER™ A46B89BZM48X

EDUCATION

Bachelor of Science in Business Administration Finance
University of Arkansas, Fayetteville, AR
Expected Graduation Date: May 2020

Honors Program GPA 3.75/4.0
Dean's List- Fall 2017 and Spring 2018



EXPERIENCE



Investment and Insurance Compliance Assistant
Arvest Asset Management, Fayetteville, AR
January 2018 - Present

- Member of the AIC Arvest Insurance team for AAM, a brokerage firm branch of Arvest Bank
- Maintained licensure files for all Arvest Insurance Agents
- Assisted with new and renewed agent appointments with insurance companies
- Performed other managerial and secretarial duties such as faxing, scanning, telephone communication with agents and companies

Orientation Leader/Mentor, Office of First Year Experience
University of Arkansas, Fayetteville, AR, May 2017 - December 2017

- Assisted with the on-going planning, implementation, and evaluation of new student orientation
- Worked as a paraprofessional in presenting and distributing information to new students and guests
- Initiated and develop open communication and interaction with students and guests
- Served as a positive role model and ambassador on behalf of the University of Arkansas

Course Reserve Assistant, Mullins Library

University of Arkansas, Fayetteville, AR, September 2016 - May 2017

- Scanned for electronic reserves, gaining proficiency with Adobe software
- Prepared usage reports of electronic reserves
- Facilitated on-going communication with professors about individual needs for reserves
- Trained new employees on software and procedure

LEADERSHIP EXPERIENCE & AWARDS



- Named Student Leader of the Month, May 2018
- Served on Walton College Dean's Advisory Board, August 2017-May 2018
- Leadership Walton, Member

TECHNICAL SKILLS



Certified Microsoft Office Specialist (MOS)

HONORS & AWARDS



- Awarded Chancellor's Scholarship (\$7,000/yr for 4 years-Awarded to top UA candidates from the general applicant pool)
- Awarded Walton College of Business Finance Department Scholarship (\$2500) fall 2017
- Beta Gamma Sigma Business Honors Society

LETTERS OF RECOMMENDATION & REFERENCES



Dean Matt Waller, May 2018

Figure 2: An example of a SmartResume as viewed by a hiring organization

2.2 The SmartResume Platform

“We selected a hybrid solution. Blockchain technology provides the ability for multiple parties to verify and trust that credentials are valid. But it would be a mistake to build the entire solution on a blockchain because it would be sluggish.” – Andy Griebel, Chief Technology Officer (CTO), iDatafy

The SmartResume platform is a hybrid platform that includes a web-based interface, traditional technologies, and a permissioned blockchain ledger. From a user perspective, all of these components are seamless. People maneuver through the platform based on their roles, such as employers, educational institutions, workforce skill certifiers, and individuals. The user interface is constantly evolving and improving, but Figure 3 provides an example of an individual resume holder’s view as of March 2020.

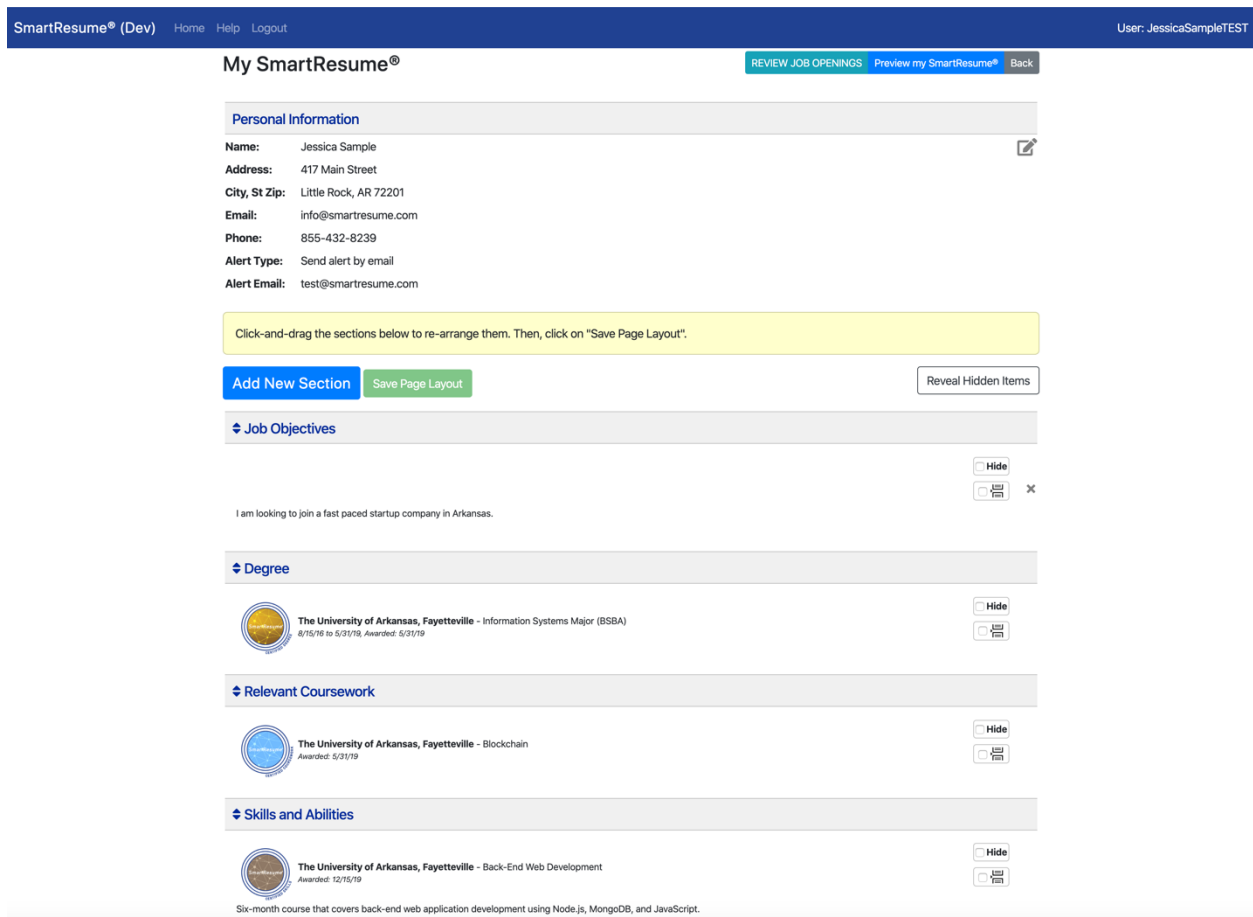


Figure 3: Screenshot for SmartResume holders as of March 2020

Behind the user interface, iDatafy chose a hybrid solution to take advantage of the features for which blockchain technologies and traditional technologies are best suited. Blockchain technology was selected to create a tamper-proof audit trail of verified credentials in a multi-party environment. Traditional databases were selected for high performance and scalability processes, such as searching for jobs and job candidates, enhancing SmartResumes with supplemental information, mapping credentials to Standard Occupation Codes, and protecting personal information.

iDatafy chose a **permissioned blockchain** where joining the network is by invitation-only and where only authorized members validate transactions. In 2018, iDatafy examined several permissioned blockchains, but ultimately selected **Hyperledger Fabric**. iDatafy felt it had the most maturity and momentum at the time. Hyperledger Fabric is supported by the Hyperledger Project, a nonprofit organization launched by the Linux Foundation in December of 2015 to advance the application of enterprise-grade blockchains across industries.¹⁸ Amazon, IBM, Maersk, Microsoft, SAP, Siemens, State Farm, Visa, and Walmart have all built blockchain solutions using Fabric.¹⁹ However, iDatafy could switch platforms if a superior technology emerges. Andy Griebel, iDatafy's CTO said, "*Our design is flexible; we could pivot to another platform if we needed to.*"

To comply with privacy regulations, no personal information is stored on the blockchain ledger. Instead, each SmartResume is associated with a unique Job Applicant Idatafier.TM iDatafy only stores a minimum of information on the blockchain ledger associated with each credential, including the unique Job Applicant Idatafier,TM credentialing organization, certification type, date, and timestamp.

Griebel offered this analogy about the value of a blockchain: "*Think of a blockchain as nothing more than a receipt that is validated by everybody who has touched it.*" The receipts are forever locked in all of the copies of the ledger, a property known as **immutability**. It's easy, however, to submit counter transactions, say in the instance that a credentialing organization later determines that a user did not actually fulfill all requirements for a credential. The SmartResume would only display the current credential, but a permanent audit trail would be there if needed. In this way, Griebel said, a blockchain ledger is like a checkbook. "*All your entries are there that ultimately created your current balance,*" he said.

3. SmartResume's development journey

The first time Dave Wengel searched for "certified digital resumes" back in 2017, he was shocked to find zero results. Why hadn't anyone built a multi-credentialed resume? Wengel thinks it's because "*there's no value if you do not have a consortium.*" He began to envision the solution and, based on his company's experiences, he knew building a consortium would be the key to success.

iDatafy's first product was **LeadReview**,[®] a proprietary data consortium used to detect bad marketing leads. The solution was launched at the end of 2011 and has since processed more than 100 million queries. The company's second data consortium, **StudentReview**,[®] was developed in 2012 to detect student financial aid fraud in the US. The context was very similar to the job acquisition process in that the market for financial aid was subject to deception and mistrust. Many individuals with no intention of attending college were signing up for US Federal government financial student aid (called "Pell grants") and would drop out immediately after receiving the money, enroll elsewhere, and repeat the deceit. In some cases, criminals organized into rings that recruited "straw students" by promising them a share of the grant money. By 2011, criminals were swindling billions of dollars each year from the US federal government. iDatafy researched the problem and discovered that the individuals re-used the same contact information (like home addresses) to receive the checks. iDatafy created a consortium of higher education institutions to build and share a FERPA-compliant directory data about the students who habitually drop out and try to enroll in multiple schools. The StudentReview platform automatically analyzes the data and flags instances where contact information is duplicated. The system alerts colleges and universities when a new applicant has dropped out of other schools after receiving financial aid.²⁰

The LeadReview, StudentReview, and SmartResume solutions are similar in that they aim to reestablish trust in markets. Each context also requires a consortium to build an ecosystem solution. To build a successful consortium, iDatafy developed a three-phased process called “crawl, walk, run.” We illustrate the process with the SmartResume consortium.

The Crawl Phase. Every consortium needs a first organizational adopter, preferably a prominent member of the target ecosystem that will help attract additional adopters through mimetic influences. For the SmartResume project, Wengel approached Matt Waller, dean of the Sam M. Walton College of Business, University of Arkansas, to become the first consortium member. *“I had just attended the Walton College’s first Blockchain for Business Conference in April of 2018,”* Wengel said, *“and I immediately connected the dots.”* Wengel did not personally know Waller, but sent him a note on the project after the conference. The Walton College was just about to launch the Blockchain Center of Excellence (BCoE), and Waller was looking for a blockchain project where the college could help lead in the development and implementation of an actual solution. Moreover, the SmartResume context of credentialing students seemed a perfect fit:

“If you think about it, colleges and universities have been issuing diplomas and transcripts for hundreds of years, but they have never actually issued certified resumes to their students, despite the colleges being in a position as a trusted authority to do so.” – Matthew Waller, dean of the Sam M. Walton College of Business, University of Arkansas, and first adopter of SmartResume²¹

Waller convened meetings with leaders within and across the Walton College to determine the university’s role in the initiative, including the campus CIO, the vice chancellor for economic development, the founding director of the BCoE, the chair of the information systems department (ISYS), and the associate vice provost from the registrar’s office. While most of the leaders were supportive of the idea, they were initially concerned about adding another major IT project given the campus was in the middle of an enterprise resource planning (ERP) replacement. They did not want to build an interface to pull student records from a system that was about to be replaced. Wengel listened to the feedback and suggested a pilot with 20 students so that it would add very little to the university’s workload. iDatafy would do the heavy lifting.

In Fall 2018, iDatafy joined the BCoE’s advisory board, was a sponsor of the Fall Blockchain Hackathon, and met many students studying blockchain technologies. Also in Fall, small SmartResume pilot programs began. The Walton College recruited 10 ISYS students and 10 ISYS alumni to volunteer to be the first individuals to receive smart resumes. The university registrar launched the volunteers’ SmartResumes on the platform by verifying credentials, doing so manually, one student at a time. The volunteers then activated their SmartResumes and provided iDatafy with feedback. iDatafy learned that there were many more skills and activities that should be certified in addition to degree programs, including the aforementioned Leadership Walton. Dean Waller agreed to manually verify Leadership Walton participation and other non-transcript accomplishments to appear on the students’ SmartResumes.

Pilots with other early adopters continued throughout the fall. By November 2018, 93 SmartResumes had been created across four partner schools.

Through feedback gained during the pilot programs, the platform was continually improved. For example, hiring organizations that recruit on many campuses wondered if there was a better way to find talent given that universities award similar degree programs, but name them differently. For instance, an information

systems degree at one school might be called computer information systems, management information systems, information technology, business information technology, business computing, or information systems engineering at other schools. iDatafy responded by creating a map of a certifier’s credentials to the Standard Occupational Codes (SOCs) created by the US Department of Labor. As an example, SmartResume maps the University of Arkansas’ Bachelor of Science in Business Administration (BSBA) degree with an accounting major to SOC codes (see Table 1).

Table 1: Map of SOC Codes to a University of Arkansas BSBA Accounting Degree	
US Department of Labor Standard Occupational Classification	SOC Code
Financial Managers	11-3031
Business and Financial Operations Occupations	13-0000
Buyers and Purchasing Agents	13-1020
Claims Adjusters, Examiners, and Investigators	13-1031
Insurance Appraisers, Auto Damage	13-1032
Compliance Officers	13-1041
Cost Estimators	13-1051
Human Resources Specialists	13-1071
Labor Relations Specialists	13-1075
Logisticians	13-1081
Management Analysts	13-1111
Meeting, Convention, and Event Planners	13-1121
Fundraisers	13-1131
Compensation, Benefits, and Job Analysis Specialists	13-1141
Training and Development Specialists	13-1151
Market Research Analysts and Marketing Specialists	13-1161
Business Operations Specialists, All Other	13-1199
Accountants and Auditors	13-2011
Appraisers and Assessors of Real Estate	13-2021
Budget Analysts	13-2031
Credit Analysts	13-2041
Financial Analysts	13-2051
Personal Financial Advisors	13-2052
Insurance Underwriters	13-2053
Financial Examiners	13-2061
Credit Counselors	13-2071
Loan Officers	13-2072
Tax Examiners and Collectors, and Revenue Agents	13-2081
Tax Preparers	13-2082
Financial Specialists, All Other	13-2099
Billing and Posting Clerks	43-3021
Bookkeeping, Accounting, and Auditing Clerks	43-3031
Financial Clerks, All Other	43-3099

The crawl phase was successful. According to Wengel, “*All initial higher education partners agree that they want to scale SmartResume further based on successful pilot input from recipients and employers expressing a need for new way to find talent.*”²²

The Walk Phase. The walk phase involved adding more consortium members, improving the platform, and moving from manual data collection and verification to automated processes.

To grow the consortium after it had enough grass-roots members, iDatafy targeted the centralized University of Arkansas System. Wengel approached Johnny Key, cabinet secretary of the Arkansas Department of Education, and Michael Moore, vice president for academic affairs for the University of Arkansas System and chief academic and operating officer for the University of Arkansas System eVersity, about the initiative in early 2019. Moore saw the value. *“A couple of things were appealing to me from the University of Arkansas System and eVersity perspective,”* he said. *“The platform provides an opportunity to elevate some of our students attending schools that might not get attention from big corporate partners. Also, it’s free to use for our students.”* Moore invited Wengel to present the SmartResume project at the July 2019 meeting of the 26 university chief academic officers from across Arkansas. After follow-up meetings, iDatafy signed one Memorandum of Understanding (MoU) for all University of Arkansas System public institutions of higher learning. Companies that recruit Arkansas talent also began showing interest in the consortium. One non-profit organization, for example, created the first workforce skills centric SmartResume. The Arkansas Economic Development Commission agreed to certify its “Future Fit” manufacturing job skills certifications on the platform.

The walk phase improved the platform’s onboarding process by automating large data pulls and asking the credentialing organization to verify the batch. The batch is then automatically uploaded onto the platform where it creates an opt-in SmartResume for each individual in the batch. By December 2019, 5,371 current and former Walton College students SmartResumes were created. In addition to degrees and major, credentials were verified with badges for Leadership Walton, the Chancellor’s Award, Beta Gamma Sigma (an exclusive business honor society), the Supply Chain Management Award, financial management/investment relevant coursework (based on minors and areas of concentration), and varsity cross-country team membership. This granularity allows hiring organizations to target their recruiting efforts. About 25,000 SmartResumes had been created (but not necessarily activated) by March 2020. *“For us to create a hundred thousand Smart Resumés right now is easier than creating five Smart Resumes a year ago,”* Wengel said.

The walk phase will be completed by mid-2020.

The Run Phase. Wengel explained, *“By this point we hope to scale our initiative and automate all the data certification processes, issuances, and job matching. We anticipate scaling nationally.”* Plans for 2020 include:

- Establish a long-term governance plan and engage partner schools to operate trust nodes in the network.
- Rapidly expand employer network within and beyond Arkansas.

While iDatafy clearly has the lead in Arkansas, we next explore the global competitive landscape for certified virtual resumes.

Competition

“Obviously, there are people out there doing blockchain diplomas, blockchain transcripts, and blockchain credential matching. No one has, to our knowledge, anywhere in the world, built a certified resume. Even if someone were to copy what we are doing, we know is how difficult it is to build a community” – Dave Wengel, founder and CEO, iDatafy

Massachusetts Institute of Technology (MIT) was one of the first major universities to issue a diploma on a blockchain. In 2017, 111 students were given a Blockcerts Wallet app with access to a verified, tamper-proof digital diploma with its hash stored on the Bitcoin blockchain.²³ One of the major lessons from the experiment was that users found it difficult to manage their own private keys.²⁴ To scale the app for live production, MIT engaged the vendor, Learning Machine. As of 2020, all recent MIT graduates receive a digital diploma in addition to a physical diploma. Students opt in to activate the digital diploma by clicking on an official MIT invitation email sent to all recent graduates. Students download the Blockcerts mobile app and add MIT as an issuer. The app generates a unique public key, which users can share with hiring organizations. Hiring organizations use the public key to verify credentials on the web portal, <https://credentials.mit.edu/>. The service is free.²⁵ According to Mary Callahan, senior associate dean and registrar at MIT, *“From the beginning, one of our primary motivations has been to empower students to be the curators of their own credentials.”*²⁶

One downside of the MIT model is that it only verifies credentials from one institution, namely MIT. If everyone adopted this model, users would be given multiple public keys and hiring organizations would need to go to multiple portals to verify a single candidate. For this reason, Blockcerts has continued to build an open source community (MIT is not actively involved) where a user may have multiple issuers. The Blockcerts community has developed versions that run Ethereum, Sovrin and Hyperledger.²⁷ The software is published under MIT Free and Open Source Software (FOSS) license. Institutions that have built their own credentialing solutions using the open source software include McMaster Engineering in Canada, Georgia Tech in the US, and Universidad Carlos III in Madrid. Rather than build a solution, institutions can also hire companies like Learning Machine, which continues to help institutions implement Blockcerts.²⁸ Customers include the Southern New Hampshire University, Republic of Malta, Federation of State Medical Boards (FSMB), and National Training Agency’s (NTA) Workforce Preparedness Program in the Bahamas. Blockcerts is planning to add photo IDs and transcripts soon.²⁹ Most of these, as Wengel notes, are verifying credentials, but not building smart resumes.

Our online research at the BCoE did not find any direct competitors, particularly within the Arkansas market. UK-based APPII was a company we found offering something similar to SmartResume, but for another market and with a different approach that is driven by individuals rather than by credentialing organizations. APPII provides a multi-credentialing service for a blockchain verified Curriculum Vitae (CV) (a CV is the UK term for resume).³⁰ Rather than build a career network consortium like iDatafy, APPII partnered with a job placement platform, TechnoJobs.³¹ We also found other companies that store blockchain credentials on the Bitcoin network, including Accredible and Credly.³² Canadian-based TerraHub Technologies created Credential Wallet for post-secondary credentials, and is working with PwC Canada.³³

Large job posting platforms and large software companies are the most potent potential competitors (or perhaps partners) for iDatafy. They have global networks of hiring organizations and individuals, but need to figure out how to verify credentials and to create individual resumes. Some are already exploring credentialing services. For example, WorkDay, one of the most popular human resources software packages, launched its “trusted professional credentials” service, also using blockchain technologies.³⁴ Salesforce, one of the largest providers of customer relationship management software, launched Salesforce Blockchain, which partners with Arizona State University to verify and store student transcripts and accomplishments on a blockchain.³⁵ The large job market platforms liked LinkedIn and Monster could adopt a similar solution to SmartResume and apply it to their customer base. They could also potentially license or even attempt to purchase iDatafy.

Lessons Learned

iDatafy’s SmartResume journey offers a number of lessons for other companies seeking to build ecosystem solutions, regardless of whether the solution will include blockchain components or not.

1. Begin the consortium with an influential early adopter.

iDatafy has built three successful consortia since 2011, with the SmartResume being the most recent. CEO Dave Wengel said that whenever he approaches a new consortium member, the first question asked is usually, “*Who else is using this?*” It’s important to pick early adopters who are influential and well-regarded in the ecosystem. For this project, Wengel knew he had to start the consortium with a large, influential academic credentialing organization. (Wengel would not recruit any hiring organizations until the career network was large enough to warrant their attention.) Wengel invited Matt Waller, the dean of the Sam M. Walton College of Business at the University of Arkansas, to become the first member in summer of 2018. As the flagship business school in the state, the Walton College had the prominence to launch the consortium. Waller was enthusiastic because the SmartResume, which uses blockchain technology, was aligned with the college’s new Blockchain Center of Excellence (BCoE), also launched in the summer of 2018.

2. A neutral, founder-led governance model offers quick time-to-value.

iDatafy could have selected a number of initial governance models, including oligarchies, stakeocracies, federations, representative meritocracies, meritocracies, and democracies (see Figure 4). It chose a founder-led model, with iDatafy serving as the benevolent dictator entrusted with driving results. The benefits of founder-led governance include swift decisions, quick execution, high efficiency, and clear control and accountability. It’s one of the fastest time-to-market governance models. Wengel self-funded the consortium to scale adoption.³⁶

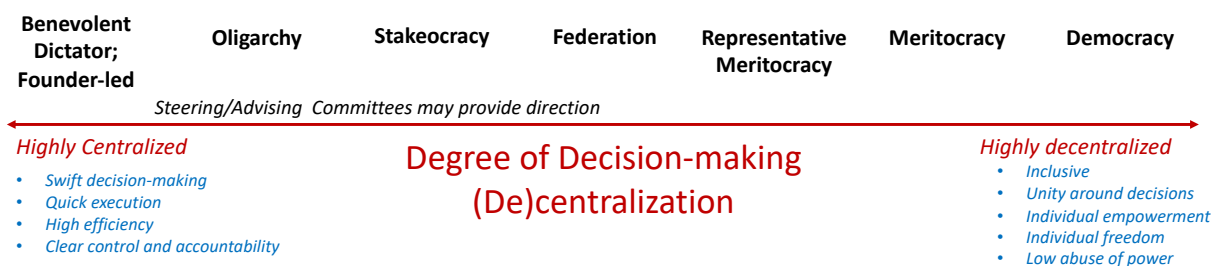


Figure 4: Blockchain Governance Models

Source: Lacity et al. (2019)³⁷

Many founder-led consortia are operated by a key industry partner (an *insider*), which make competitors reticent to join. For example, Maersk led the development (with IBM) of TradeLens, a platform to track shipping containers, but competitors were initially skittish about joining. (Competitors have since joined due to positive actions taken by Maersk, such as creating an advisory board that includes competitors.) In contrast to the Maersk model, iDatafy is a neutral party that does not compete against the key student record

providing partners of SmartResume. Wengel said, *“iDatafy is a kind of the middle person, but we’re also able to stay laser focused on this, and I think it has become very clear that a dedicated persistence is needed to drive new things forward.”*

3. As quickly as possible, standardize the membership onboarding process.

When Wengel was first building the consortium, approaching each new potential member was a long, non-repeatable pitch process. Each stakeholder organization has its own culture, so he needed to find the right project champion within each. For example, some of the academic consortium members were driven by college deans like Waller, whereas others were driven by career services or by a senior academic officer. Wengel said, *“Which stakeholder should you gravitate to when you are evangelizing something new? People have their own initiatives, their own priorities...that’s understandable. We really spent a lot of time figuring out who is genuinely excited and wants to be a part of this. You don’t build a consortium by working with people who will just kind of tolerate you.”* But even with the right project champion, formal agreements can take another few weeks or even months. *“People don’t operate in a vacuum,”* Wengel said. *“If someone agrees to do something, then they have to tell their boss. And then that boss has a committee. It takes a lot longer than one might think.”*

After enough early grass-roots adopters were onboarded, iDatafy sought a more centralized authority that could blanketly onboard many institutions. Getting a single Memorandum of Understanding (MoU) at the University of Arkansas System certainly sped the onboarding process. *“A single MoU saved all of our other campuses from having to do a bunch of one-off agreements,”* Moore said. *“The blanket agreement authorizes iDatafy to work with any of our campuses.”*

4. As the consortium grows, be prepared to pivot as new needs emerge.

The consortium’s stakeholders steered the SmartResume project in directions even Wengel had not foreseen. Since the initial credentialing organizations were from higher education, the SmartResume platform was originally envisioned as a certified platform primarily for knowledge workers. But as he spoke with large hiring organizations, he learned that they were not only having trouble finding enough white-collar professionals, they were also in need of a large number of welders, diesel mechanics, truck drivers, and forklift operators. He then went in search of the organizations that credential such skills. For example, one Arkansas non-profit joined the consortium to verify forklift operators. Many of its employees were previously incarcerated and frequently had trouble finding good jobs, which is a key factor in lowering recidivism rates. *“For those individuals that have gone through tough circumstances, they’re credentials are doubted even more,”* Wengel said. *“It’s just a fact by employers. So that’s our goal now, to help employers find white collar, blue collar, and no collar talent.”*

5. Improve the technology platform based on short-sprint stakeholder feedback.

iDatafy actively sought feedback on each iteration of the platform. Early on, it was evident that most people have credentials from multiple universities, but what if a SmartResume user has a degree from an institution that has not yet joined the consortium? iDatafy allows users to add uncredentialed degrees, but guides them to use the federal government’s standard naming convention. This way, as-yet-to-be verified credentials accumulate, iDatafy can approach those institutions with evidence for joining. The SmartResume platform can grab all the uniformly-named institutions for review.

User feedback also prompted another change, namely, to stop displaying older credentials when newer ones are activated, such as transitioning from a student to a graduate. Most importantly, feedback very early-on convinced iDatafy to adopt the opt-in model where users have to go to the platform, see if a credentialing organization has created a SmartResume for them, and then activate it. This was the right thing to do to protect users' privacy and to get a more engaged user, even though it slowed the rollout. Wengel said other competitors who create public data without user knowledge will scale quickly, but may ultimately fail when users start getting unsolicited contacts. He concluded, *"Listening to feedback from the most important users of the system is a central tenant of why we have gotten where we are so quickly. Their feedback helped us to make the platform usable, and to make it easy for them to get engaged."*

Equally important is knowing how to balance stakeholder feedback with scope creep and dealing effectively with suggestions that are counter to the philosophy of the platform. One stakeholder, for example, wanted iDatafy to mask the credentialing organization in addition to the other data fields. While this suggestion would help job candidates from lesser-known institutions, it would be counter to the value proposition of promoting and protecting a credentialing organization's brand.

6. Offer unique value propositions for each stakeholder.

Based on prior research, ecosystem solutions need to provide a compelling value proposition for each stakeholder. The stakeholders who get the most business value from the solution will be willing to pay the most fees. In some blockchain solutions, stakeholders who perceive little value, but who are key to the success of the solution, need to be incentivized to join.³⁸

For the SmartResume solution, iDatafy does not charge credentialing organizations; it needs them to create the credentials. iDatafy does not charge individual resume users, who are often students. *"There are no fees for credentialing organizations or the users,"* Wengel said. *"There's a good business reason... in addition to just being the right thing to do, it's the key to scaling something like this quickly."* Once scaled, hiring organizations will gain the most value from the solution, and they will be charged fees for the platform. But iDatafy delayed charging hiring organizations until the credentialing organizations had gotten through their internal processes to launch enough SmartResumes. This way, project delays caused by things out of iDatafy's control wouldn't sour the relationships with hiring organizations. *"We're not charging you a dime unless we help you hire someone,"* he told them. *"We're motivated to make sure that we get this done right."*

As of first quarter 2020, a number of business models and fee structures are being explored with input from the hiring organizations. However, Wengel was clear on which business models he would not use: *"We know that we're not building a commodity, so we're not going to charge employers to post jobs... anybody can do that. Our goal is to actually help them hire someone with the right skills, and by doing that, we will get a premium for the service. But to do that, you have to have the scale."*

7. For individuals, society is not quite ready for self-sovereignty.

Self-sovereignty over personal information is one of the espoused benefits of blockchains. In the future, it is argued, people will have complete control over their personal data by securing their information on blockchain technologies. They will own their data, grant access at their own discretion, and even charge fees for others to view their data. Such peer-to-peer solutions with no trusted third parties exist today, and it is indeed a beautiful vision of individual freedom and empowerment. However, only a small proportion

of society has the technical abilities to secure their own private keys. Many individuals still rely on a trusted third party, like a cryptocurrency exchange, to manage their private keys for them. For now, Wengel sees that individual users will need a centralized service to manage things like private keys and logon passwords. *“Think about how many times you forget your password,”* Wengel said. *“The public is not ready to have that kind of self-sovereign identity to completely run this on a blockchain. There is value in blockchain, at least right now, of not putting personal data on a blockchain, but still having the benefits of knowing trusted institutions have done the certifications.”*

Conclusion

iDatafy has come a long way in 18 months; it has established, built, tested, and deployed the SmartResume platform. The platform addresses three problems with current job acquisition solutions: it verifies credentials, reduces selection bias, and ensures data privacy. But no platform is useful until a critical mass of adopters has been reached. Here, iDatafy has been successful in that the consortium includes the major institutions of higher learning in the state of Arkansas, and non-traditional credentialing organizations are added monthly. iDatafy has also been able to obtain commitments from major hiring organizations. The time it took iDatafy to build the consortium provides a sticky competitive advantage that others could not easily overtake, at least in Arkansas.

Looking ahead, iDatafy has a solid lead in one territory, but if it is to scale beyond the state of Arkansas, it will need to find a faster way to build consortia in other territories. With patents pending, iDatafy might license its software to other companies that have established networks (like the APPII model). Or perhaps one of the aforementioned large companies will license or acquire it.

The ultimate litmus test for the SmartResume platform, or other solutions that might follow, will be when hiring organizations rely on the SmartResume as the official system of record. That is, when hiring organizations are so confident in the platform, they no longer contact credentialing organizations to verify credentials or ask potential employees to provide notarized documents. Very soon, we hope outlets such as the Harvard Business Review will report, *“Businesses have never done as much hiring as they do today. And they’ve never done a better job of it.”*



About the Blockchain Center of Excellence (BCoE):

The BCoE is housed in the Information Systems Department of the Sam M. Walton College of Business at the University of Arkansas. The BCoE was officially launched by US State Governor of Arkansas, the Honorable Asa Hutchinson, on August 1, 2018. The center's vision is to make the Sam M. Walton College of Business a premier academic leader of blockchain application research and education. The BCoE's case study series is one activity toward achieving that vision.

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