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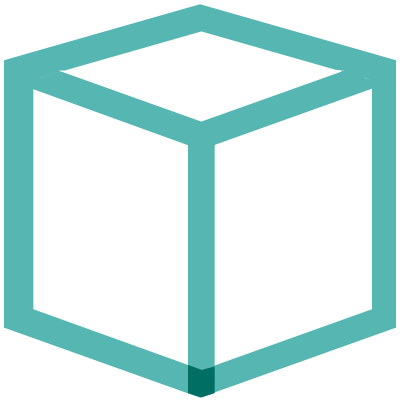


Blockchain in action

How business schools are addressing blockchain.

Why Blockchain?

Blockchain is a technology with the potential to cause some significant shifts in business and business education in the coming years. We have gathered examples of blockchain in action, demonstrating some of the ways business schools are incorporating this technology into their programming.

If you want to learn more about what blockchain is, you can review our blockchain brief, *Technologies With Potential to Transform Business and Business Education: Blockchain*, which provides a high-level overview of what blockchain is capable of and how it might be applied in business and business school settings.

Inside you will find:

- A case study on a large blockchain initiative
- Perspectives on the impact of blockchain on business education from various stakeholders
- The results from a quick-take survey of business school deans on blockchain's impact
- Blockchain in Action, highlighting examples of business schools implementing blockchain learning experiences

A Business Perspective on Blockchain

With nearly 30 years of experience in cybersecurity and IT auditing, A. Michael Smith is responsible for PwC's U.S. Internal Technology Audit Services. As part of this role, Smith has overseen the growth of PwC's blockchain enterprise. Smith also serves as the co-chair of AACSB's Digital Transformation Affinity Group.

AACSB: Let's start with a big question. How big of a deal is blockchain?

A. Michael Smith: Oh, it's going to be a big deal. Its impact is going to be substantial. Some colleagues and I believe that there's serious potential for this to be an internet-level type of event. Blockchain could profoundly alter the way we think about trust and how that trust is managed. If you think about transactions, like purchasing automobiles, purchasing real estate, anything like that—all of that could profoundly be affected and changed. The impact will be significant. There's just absolutely no question about that.

AACSB: How much impact is blockchain having in PwC's business model?

Smith: At PwC, we do technical consultative engagements about blockchain. We have many clients engaging with us on these blockchain-related projects. And these clients span a wide range of industries, like food safety, shipping and logistics, supply chain, airframe manufacturing, cryptocurrency, virtual assets, and more. In terms of money going into research and development and development of proofs of concept, there's more money being spent in financial services and in the crypto asset space than any place else, without question. But ironically, there's probably more production uses everywhere else just because of the challenges with deploying something live in the financial services sector because of regulation, most of which has still not really caught up with the technology.

A Business Perspective on Blockchain

AACSB: If blockchain is going to have that kind of impact, why haven't we heard more about companies that are investing in it?

Smith: There is a lot of secrecy with these projects. The problem with research in this space is that most of what people are doing is considered confidential, and so you're just not going to get a straight answer when you are asking people about their blockchain endeavors. But a whole lot is going on beneath the surface. Recent advancements with Stable Coin ecosystems has resulted in several more large organizations going public with their projects, as we have seen in the last six to eight months.

AACSB: Beyond handling the confidentiality, what other challenges have you encountered when working with clients on blockchain projects?

Smith: One of our biggest challenges regarding blockchain is managing perception. There is a perception that people have going into a blockchain project, where they think they know what it is and all its applications, and 90 percent of the time, that perception is either incomplete or just incorrect. Oftentimes, they are taking a use case of blockchain that they happen to be very familiar with and assuming that it is representative of all that blockchain can do. Blockchain is not, in any way, a product or application. It's a form of computer science and, specifically, a form of applied cryptography that, if implemented correctly, gives you the opportunity for transaction processing systems with much higer-than-standard levels of trust.

There really is no standardization to blockchain. Let's say you look at one use case where a company is leveraging distributed ledger technology (DLT). I could offer five more examples that aren't using DLT at all. And so you have to bear in mind that if you look at a dozen different blockchain use cases, you might see a dozen different types of software and half a dozen different types of architectures, most of which will have little or nothing in common.

Blockchain in Action:

University of British Columbia, Sauder School of Business (Canada)

The University of British Columbia launched Blockchain@UBC, a multidisciplinary research cluster on blockchain that focuses both on research and curriculum aimed at advancing the emerging technology. Research projects engage academic and research partners, while teaching initiatives span undergraduate, graduate, and executive-level programs equipping students with knowledge and qualifications around blockchain. Educational programs include the Summer Institute—a two-week comprehensive summer program for students and community members delivered in collaboration with academic and industry partners.

Additionally, the Graduate Blockchain Training Path was created to build capacity in blockchain for existing master's and doctoral students and aims to help scale Canada's blockchain industry. The program focuses on four primary sectors—health and wellness, clean energy, regulatory technology, and indigenous issues—and has set a goal to train over 100 students over six years.

A Business Perspective on Blockchain

AACSB: You have some connections with business education and are currently co-chair of an AACSB affinity group. Could you explain how that came to be?

Smith: Well, in my role at PwC, I must hire technically capable people. And I really struggled with getting entry-level people I could use, which led me to AACSB. I graduated from Baylor [University] down in Texas, and my family has a lot of connections with the school. So, about six years ago, I used those connections to get a program started in the business school that produced people with a business background, but with a much higher-than-standard "IT IQ". Students would graduate with hands-on experience with cybersecurity tools, hands-on experience with data analysis tools, things like that. And so, it was a way for me to facilitate getting the skill sets that I needed coming out of academia. Later, the Digital Transformation Affinity Group was started at AACSB, which focuses on transformative technologies. And, from my work with Baylor, I was asked to help co-chair that affinity group.

Blockchain in Action:

Tecnológico de Monterrey (México) EGADE Business School

EGADE Business School partnered with Grupo CICE and Hutchinson Ports México to focus on using blockchain technology in the Port of Veracruz as a way to improve its operational, administrative, and logistical processes.

Tecnológico de Monterrey and the business school aim to form closer collaborations with industry in order to create solutions to challenges faced within the digital economy, and blockchain presents one such solution for creating greater confidence in international trade.

A Business Perspective on Blockchain

AACSB: How well are business schools doing at developing those technical skills that you look for when hiring?

Smith: The reason I spent so much time getting that program set up with Baylor was because our normal channels were not producing what we needed. And outside of just a few schools, I haven't seen students who are consistently graduating with the necessary IT IQ or sort of hands-on experience to do what we need them to do. And that IT IQ is critical.

Today, every single professional in the firm in the U.S.—whether they are in tax or audit or consulting or anything—100 percent of the professionals have to take an IT IQ exam, and we work with them to improve their IT IQ. It makes no difference what their job is in the firm. Because, we realized, there's literally nothing we can do that does not have some sort of IT component. I mean, we just don't have a single client that doesn't have some type of heavy IT build associated with either their financial statements or their financial reporting. So, it's just gotten to the point now where you literally can't do your job without a standard IT IQ for hiring. I would take a student from the Baylor program over a student with a Ivy League MBA, because I know that I'll be able to use the student from the Baylor program. That student is getting the targeted experiences we need.

> "It's really rare to find a technology that elicits such extreme views... I've always been interested in technology and so I thought that providing a more objective way to evaluate this technology would be an important contribution to everybody."
>
> —Cesare Fracassi, Director of the Blockchain Initiative, McCombs School of Business, The University of Texas at Austin

Blockchain in Action:

The University of Texas at Austin, Red McCombs School of Business (United States)

Sensing growing interest in blockchain, the McCombs School of Business launched its Blockchain Initiative in 2018 to advance objective, well-supported information on the evolving technology through teaching, research, and external outreach.

One of the projects the initiative launched is a collaboration with the university's medical school to create better mechanisms for clinics and social services to aid the local homeless population, using blockchain to help track their medical records.

A Business Perspective on Blockchain

Most people don't even have a basic understanding of cryptography, much less applied cryptography. You can't just read a book on these concepts and expect to be an expert, though. Because just in the time it takes a book to get published, there will be dozens more use cases and a bunch of changes in the consensus mechanism. So, instead of focusing specifically on blockchain, students should focus on gaining a basic understanding of public key infrastructure cryptography, and a basic understanding of database architecture. And then we can have a much more intelligent conversation about blockchain.

That's what concerns me about what I've seen from business schools with respect to blockchain coursework. What is happening in classes is that they're teaching people distributed ledger technology and cryptocurrency. And then, that student graduates and gets a job, and their boss will want them to work on a new blockchain use case and they're not going to know what to do, because they've only gotten a very specific look at one application of blockchain, without having the expertise in underlying fundamentals.

At the end of the day, if you want to succeed in this marketplace, you just need to understand conceptually how this stuff works and then be able to have intelligent conversations about it and think about it in terms of strategic options from a business perspective. It's the same thing as artificial intelligence. Most people don't know even the tiniest bit about artificial intelligence. But thanks to things like Terminator, they have a pretty decent idea about what it does. We don't have that for blockchain.

Blockchain in Action:

Portland State University, School of Business Administration (United States)

Portland State University is launching a Business Blockchain Certificate at both the undergraduate and graduate levels by the end of 2019.

The certificate will focus on business models and use cases, and will involve startups and enterprises in analyzing value creation through blockchain technology.

A Business Perspective on Blockchain

AACSB: There is a lot of talk in the business education space about the potential for artificial intelligence, virtual reality, and other transformative technologies. How do you think blockchain compares in terms of its potential impact?

Smith: Well, all those things are going to have an impact. Based on discussions I am hearing; I think AI and blockchain will have the biggest impact across sectors. The reason for that is they apply everywhere. Again, they're not tools. It's computer science. Consider drones—those are more of a tool. They will have an impact, but that's a utility. You're looking at a way to use a product, so there are inherent limitations on that. But I think what you're going to see that's different and the true power from these technologies is when they're used together. And so, what I think the "next thing" you're going to see is the bundling of these technologies to produce highly strategic results or things that maybe have not even been contemplated before that's just going to astonish people.

> "If you're thinking about developing a blockchain course or blockchain study, you really should be thinking about the study of applied cryptography, not the study of cryptocurrency or distributed ledger technology. That is something important for educators to understand."
>
> —A. Michael Smith, PwC

Blockchain in Action:

Baylor University

Instead of teaching content directly related to blockchain, Baylor develops underlying fundamentals in its students that provide a strong foundation for understanding blockchain and related technologies.

One example is the Baylor University Cyber Security Student Organization, which competes in cyber defense competitions. They also offer several data analytics courses, where students learn skills that can lay the groundwork for future blockchain-specific applications.

A Business Perspective on Blockchain

AACSB: What kinds of combined applications do you anticipate?

Smith: As an example, I can use a relatively simple use case about earth-friendly cocoa beans for "green" candy bars. Let's say an organization has to certify that the cocoa beans were being harvested from certified green farms and that they were transported in a manner that didn't corrupt the agricultural integrity of the beans. So, in this use case, the company decides to leverage blockchain, AI, drones, and the "internet of things" to manage this process. The blockchain provides the underlying record so that they would have an irrefutable record that the beans were harvested from certified green farms. And then there can be a linkage of the certifiers who do that to make sure it was a valid certifier connected to the blockchain. And then the blockchain tracks the information points that are compiled and sent to the underlying database as the beans make their way from harvest into manufacturing. Drones, IoT and artificial intelligence can then be used to grade the quality of the bean through shipment and manufacturing and then those results are fed back into the blockchain engine. So, at the end, you have a perfect profile of the quality of the beans themselves on an irrefutable record. And the fact that it happened to be something that was harvested outside and transported across a variety of media was irrelevant.

All that said, there are plenty of other factors to consider with implementing something like this. As recently as five years ago, that operational process, the initial supply chain with the cocoa beans, is what you would put an entry-level accounting major on if they were on that audit. Well, now you can't do that anymore. Now, you must have someone who understands all those technologies to be able to monitor that process. So, I can't use entry-level employees for that now because they don't have the skill set. Simple processes become streamlined with these technologies, but they also become highly complex. That is the tradeoff.

Blockchain in Action:

Cheung Kong Graduate School of Business (China)

CKGSB offers a three-day executive education program designed and delivered by scholars as well as experts and founders of blockchain companies in China and the U.S.

The program covers the foundations of blockchain, as well as future implications of the growing technology, including within the regulatory and legal environment.

Targeted participants include executives, investors, and entrepreneurs in the fintech sector.

Blockchain Brings Schools Together

Case Study: The University Blockchain Research Initiative (UBRI)

Ripple provides a single, unified experience to send money globally, leveraging the power of blockchain. With offices in San Francisco, New York, London, Mumbai, Singapore, Dubai, Reykjavík, and São Paolo, Ripple has attracted more than 200 customers to its growing network, RippleNet, to process payments anywhere in the world instantly, reliably, and cost effectively.

In mid-2018, Ripple began the University Blockchain Research Initiative (UBRI), which brings together 34 academic partners worldwide that have an interest in accelerating academic research, technical development, and innovation in blockchain or related technologies.

The impetus for the initiative stemmed from the growing interest among universities to connect on blockchain through guest lectures, research project ideas, and partners—as well as Ripple founder Chris Larsen's interest in creating a formalized partnership with universities instead of ad hoc collaborations.

UBRI launched in June 2018 with a 50 million USD philanthropic donation to partner universities and with the sole mission of accelerating the understanding, innovation, and adoption of blockchain, cryptocurrency and digital payments. Partner schools use the donation to their discretion, but many have funded research projects or developed new curricula related to blockchain, as well as hosted and facilitated workshops, seminars, and conferences in their local communities.

Blockchain Brings Schools Together

Some schools have used the funds for creating scholarships or fellowships for research, while others have invested in student activities like student blockchain clubs, which are increasingly appearing across campuses. Some student blockchain clubs have resulted in impressive projects such as consulting with local companies, launching new businesses, or developing blockchain-related courses facilitated through online platforms like Coursera.

Students play an important role in advancing the acceptance and helping steer the conversation of blockchain more broadly. As more incoming students inquire about learning and extracurricular options in blockchain, cryptocurrency, and related technologies, UBRI has been helping its partners facilitate some of those requests and expand on their current offerings.

As partners of UBRI, universities are granted access to Ripple's software, data, XRP Validator,[1][2] and any other necessary tools[3] for carrying out their projects or research. Partners represent a variety of disciplines—like engineering, business, and law—and accordingly, the types of projects they work on address a variety of issues.

Blockchain in Action:

University of South Florida, Muma College of Business (United States)

Faculty at the University of South Florida's Muma College of Business have been collaborating with a blockchain startup, Pocket Network (POKT). POKT intends to provide easy access to any blockchain through an application programming interface (API) layer[4].

In the first quarter of 2019, this collaboration developed into an externship initiative to build industry collaboration at the college.

The externship research project focuses on developing the incentive-compatible economic model for POKT, conceptualizing the network as a two-sided network.

1 XRP is a digital currency that allows for a reliable, on demand option for cross-border payments. Running an XRP Validator is open source and can be done so by anyone.
2 "Run a rippled Validator". XRP Ledger, https://xrpl.org/run-a-rippled-validator.html
3 Bear, Ethan. "The Next Chapter of Xpring; The Open Platform for Monday." XPRING, https://coil.com/p/xpring/-The-Next-Chapter-of-Xpring-The-Open-Platform-for-Money/T7PnNqnRt
4 www.pokt.network

Blockchain Brings Schools Together

UBRI believes that understanding blockchain's legal and regulatory aspects, for example, is just as important as understanding its technical workings, and therefore disciplinary diversity plays an important role in developing future talent in the area.

Although some of the research and projects that academic partners embark on do not directly address Ripple's area of business expertise, the collaboration has proven to be mutually beneficial. The research conducted by partners schools helps Ripple learn what potential possibilities and opportunities exist for blockchain outside of cryptocurrency and global currency exchange.

Lauren Weymouth, senior manager of the University Partnerships Program at Ripple, said, "We're looking to university partnerships in the business schools to analyze challenges currently faced in the sector as well as to research other possibilities outside of our current focus. There are many other uses out there that are going to become possibilities in the next five years. That's what we're looking for the scholars to achieve."

Blockchain in Action:

University of Nicosia, School of Business (Cyprus)

The University of Nicosia in Cyprus (UNIC) promotes itself as the first university in the world to offer a blockchain degree program, as well as the first university to accept bitcoin for tuition payments. Recognizing blockchain as a technological breakthrough, UNIC has significantly invested in the advancement of blockchain knowledge through curricular offerings such as the MSc in digital currency, which has been awarding students with an online graduate degree in blockchain/ digital currency since 2014.

UNIC also offers free MOOCs on digital currencies as well as an online Blockchain Professional Certification Program.

Blockchain Brings Schools Together

Furthermore, partnering with universities helps connect Ripple to future talent who have a passion for or need to develop a skill set in blockchain.

Finally, the work being done by UBRI partners plays an important role in generating greater acceptance and, more importantly, understanding of blockchain and its opportunities. Weymouth added, "We're really interested in enterprises and businesses that are trying to work within the system and add value. I think if our business school partners can train more students on what is working and what is real—the real uses of blockchain—they can later come up with new ideas themselves to advance business through blockchain in different ways."

Currently, UBRI is not accepting new members. The program launched an annual academic convening, UBRI Connect, in October 2019 to bring members together to network, learn from one another, showcase their work, share ideas, and create connections.

> "We're not going to move forward if we don't figure out the questions of regulation and policy behind blockchain implementation. It's something that Ripple has taken very seriously. We don't think of ourselves as disruptors; we think of ourselves as innovators, because we've been working with these companies and about 40 regulators around the world trying to figure out how this is going to be impactful but not disruptive."
>
> —Lauren Weymouth, Ripple

Blockchain in Action:

Morgan State University, Earl G. Graves School of Business and Management (United States)

Morgan State University recently founded the Center for the Study of Blockchain and Financial Technology (the FinTech Center). The center was established to provide an environment that promotes learning and more in-depth understanding of blockchain technology and its impact on finance, business, government, and various aspects of social life. In February 2019, the FinTech Center received a multiyear grant from Ripple, a company that has invested heavily in blockchain research.

Morgan State University's UBRI program will include development of specialized curricula; expansion of academic courses; hosting of conferences; and awarding of scholarships to faculty and students pursuing work in blockchain, cryptocurrency, digital payments, and related topics. The center also serves as a resource that will support the faculty at Historically Black Colleges and Universities (HBCUs) seeking to engage in fintech course development and research initiatives.

Blockchain Quick-Take Survey

To better understand how business schools were reacting to blockchain and its potential impact on business and business education, in September, AACSB asked business school deans to provide their quick-take on the technology. 68 deans participated in the brief Quick-Take survey, representing 15 different countries.

>25%

said that blockchain will have a significant impact on business school records or credentialing.

>50%

said that blockchain is already being taught in their school's curriculum.

Source: Blockchain Quick-Take Survey n=68 business school deans

Blockchain in Action:

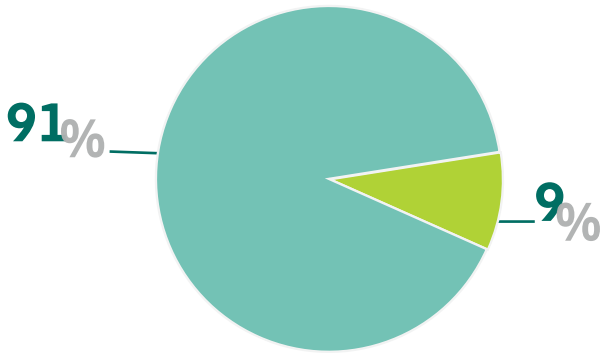
University of Pennsylvania, The Wharton School (United States)

The Wharton School joined forces with Penn Engineering to offer a dual graduate degree program that includes a course on blockchain in which students address challenges from both a technical and business perspective.

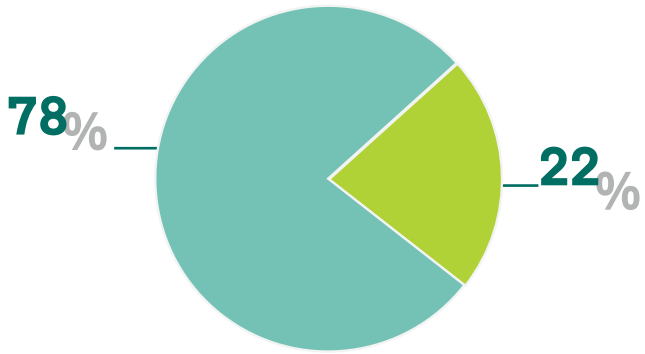
As a partner school of the University Blockchain Research Initiative (UBRI), the dual degree program offers a fellowship to up to four students per year who have an interest in blockchain and cryptocurrency.

Blockchain Quick-Take Survey

Will blockchain have a significant impact on **business**?



Will blockchain have a significant impact on **business education**?



Source: Blockchain Quick-Take Survey n=68 business school deans

Blockchain in Action:

Singapore Management University, Lee Kong Chian School of Business (Singapore)

Singapore Management University has incorporated blockchain into its recently established SMU Academy. SMU Academy offers a range of professional courses and programs that aim to prepare the workforce with the needed competencies to remain competitive across areas such as finance and banking, HR management, and information technology.

Courses including certifications in blockchain comprise several of these offerings, from introductory courses on the technology to courses on building interfaces that interact with blockchain.

Students Take On Blockchain

While many business schools are working to offer officially sponsored blockchain content, enterprising students are taking it on themselves to generate additional opportunities. Blockchain clubs and societies have popped up in business schools around the world, where students come together and engage in blockchain-related activities.

One such example is found at the University of Washington, which offers the Blockchain Society, a student club, focused on educating students on blockchain content and connecting them with practitioners who are already applying blockchain in real-world scenarios. The society has multiple branches, on each of Washington's campuses, in Seattle, Bothell, and Tacoma.

A recent project that the University of Washington Blockchain Society undertook was the development of a secure reporting tool designed to create a timeline of events in situations of domestic violence.

This project came together during one of the Blockchain Society's regular hackathon events, where members of the Blockchain Society collaborated to come up with new and innovative applications for the technology. If an idea gains steam and seems like a potential venture by the students in conjunction with business representatives, the project can move beyond the society to an actual entrepreneurial endeavor, something that the Blockchain Society fully embraces and supports.

Robert Lin, one of the student participants in the Blockchain Society, shares the reasons for his passion for studying blockchain: "People generally either already know about blockchain or they just don't want to know about blockchain. But people who fail to act on blockchain will get left behind, because it has the potential to radically improve inefficient systems."

Blockchain in Action:

Bloccelerate VC

Professional experts in blockchain have taken note of the passionate students engaging in blockchain clubs at colleges and universities and have engaged with them by speaking at their events and partnering on certain projects.

An example of this in action is Bloccelerate's active presence with the blockchain societies at the University of Washington and the University of Oregon. Bloccelerate, a venture capital fund focusing on investments related to blockchain, is committed to a long-term goal of facilitating university research on blockchain.

Bloccelerate hosts an annual hackathon for these universities, drawing more than 400 attendees and partnering with blockchain clubs to do so. Bloccelerate also brings on students to become interns, teaching them to work with blockchain in a real-world setting.

Common Obstacles for Blockchain Adoption

- Significant general public confusion and misconceptions around what blockchain is, how it can be used, and what it can do.
- A need to create a standard protocol across all players for blockchain to be useful and more widely used.
- Overcoming regulatory boundaries will require significant time, particularly in industries that are highly scrutinized, such as accounting and finance.
- A need to teach potential investors about the various applications of blockchain and how it could improve their operations.
- Confidentiality regarding blockchain projects clouds our current understanding of blockchain's scope, which could dissuade educators and professionals from beginning to experiment with the technology.
- Currently, high initial cost for implementing blockchain from scratch, due to high resource demands such as infrastructure requirements the need for technically qualified staff, and other cost factors.

Blockchain in Action:

National University of Singapore, NUS Business School (Singapore)

National University of Singapore announced a partnership with Chinese technology company Chongqing Jinwowo Technologies on research and development into blockchain-based solutions.

In addition to research, the partners have participated in a blockchain and big data seminar to raise awareness about the rise of blockchain technology and to promote the development and implementation of its applications.

Blockchain in Credentialing

More schools are beginning to experiment with leveraging blockchain technology in the credentialing space using Blockcerts, an open standard for creating, issuing, viewing, and verifying blockchain-based certificates or blockchain-based digital credentials. Initially developed by Learning Machine and MIT Media Lab, Blockcerts is currently being used by educational institutions in several ways:

- King Abdullah University of Science and Technology (KAUST), Saudi Arabia, partnered with Learning Machine Technologies in 2018 to explore issuing Blockcerts. Digital diplomas were issued to all KAUST students who graduated in December 2018. Recipients received, stored, and shared their digital diplomas via their Blockcerts Wallet mobile app, which also allowed them to share their Blockcerts with employers, government, and educational institutions around the world for immediate verification.

- The University of Bahrain also partnered with Learning Machine to issue digital diplomas using the Blockcerts open standards. The school plans to pilot use of Blockcerts with post graduate programs and eventually expand to undergraduate programs.

- The Maltese Ministry for Education and Employment began a a two-year agreement in February 2019 to roll out Blockcerts to all Maltese education institutions. This rollout will aim to have all of these institutions issue academic credentials, including including diplomas, certificates, and transcripts, to Maltese students in a digital format.

Blockchain in Action:

Frankfurt School of Finance & Management gGmbH (Germany)

The Frankfurt School Blockchain Center is a think tank and research center, founded in 2017, that examines how blockchain may impact companies and their business models.

In addition to research, the center provides learning experiences for students and executives, including a certificate program and a dedicated bachelor's program in digital innovation and fintech.

Through its community of blockchain scholars and experts, the center delivers events focused on various areas of blockchain and also participates in creating consulting and research projects.

Related Content

Explore other AACSB publications related to blockchain:

- Brief: Technologies With Potential to Transform Business and Business Education: Blockchain
- Article: B-Schools Are Building on Blockchain
- Blog Post: Fintech and Business School: What It Is and Why It Matters
- Blog Post: Untapped Opportunities for Fintech in Business and Academia

Blockchain in Action:

NIDA Business School (Thailand)

NIDA Business School announced a partnership with a local blockchain consultancy, Siam ICO, to introduce its Blockchain for Enterprise Transformation course, which aims to drive digital transformation for organizations in the public and private sectors.

The course will also be open to the general public with plans of eventually including in NIDA's MBA program.

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