

JUNE 2020

# Innovation **insights**

**bsi.**

## **Instruments of Trust:**

BSI's Blockchain-Based Solutions





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INNOVATION INSIGHTS



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# Instruments of Trust: BSI's Blockchain-Based Solutions

"In today's global, interconnected economy, there is a growing trust deficit felt by businesses and consumers."

**Dan Purtell, Group Innovation Director**

**F**alse assertions are prevalent in society leaving people uncertain of whom and what to trust. Counterfeit products and false claims are far too prevalent and perpetually flood the market. Examples include counterfeit drugs/fentanyl-laced prescriptions, false or misleading food labels, and the range of credentials provided to others as part of our daily lives – passports, qualifications and so on.

At BSI, we are passionate about inspiring trust and help individuals and organizations remain resilient in an uncertain world. Challenges remain within legacy trust systems, and businesses and consumers demand an immutable source of truth and verification.

To help combat false claims, BSI has launched a series of blockchain-based

solutions to provide organizations and individuals a secure and irrevocable means of verifying the authenticity of claimed personal credentials as well as company and product certifications. Using blockchain technology, this single source of truth can provide our clients the ability to demonstrate to their customers the authenticity of their claims, be it certifications, product authenticity, or traceability.

BSI's partnership with **Trace Labs** has strengthened our digital verification footprint using Distributed Ledger Technologies and utilization of the **OriginTrail** blockchain protocol. This allows BSI to provide a suite of solutions that will serve as instruments of trust for our clients, enhancing the resiliency of their brand. ▶



Read about  
Trace Labs on  
next page



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## About Trace Labs

Trace Labs is a Hong Kong-based company developing enterprise solutions for trusted data exchange across the supply chain. Their solutions enable forward-thinking organizations to get the most knowledge and make better decisions based on interconnected data from their supply chains. Trace Labs is also the core development company of the open-source OriginTrail protocol for blockchain-based data exchange - making supply chains work together.

Founded in 2013, Trace Labs has built award-winning enterprise solutions for supply chains, ranging from traceability to verifiable claims. In 2017, Trace Labs received an award from Walmart Food Safety Collaboration Center. Trace Labs believes sustainable supply chains are only possible by allowing all organisations, big or small, to benefit from trusted data exchanges.

In 2019, BSI exclusively partnered with Trace Labs to deliver blockchain-enabled solutions that will enhance its global assessment, certification and supply chain services to confirm the provenance of goods and/or the integrity of digital records or services.



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# What is a blockchain?

While many definitions exist, it is perhaps easiest to understand blockchain when it is compared to other existing ways information is stored.

**T**ake for example, writing words on a page, or using a computer in which information is stored behind the scenes in a database. A blockchain provides a similar means of storing

information, but there is a significant additional benefit - the information stored cannot be removed or changed, making it a trustworthy and unchangeable source of truth. Information on a page or in a database can be scrubbed out,

modified, copied or even destroyed, but information entered on a properly managed blockchain is there forever. This simple concept, whilst sounding relatively innocuous, opens up a myriad of new possibilities. ▶

**Here is a step-by-step process when information is stored on the blockchain**

- 1** That information is captured in an agreed form and syntax as a record.
- 2** Then, the validity and integrity of that record is then checked by participants using that blockchain. This requires an agreed approach to checking each record.
- 3** If the participants agree that the record is valid and meets requirements, the record is accepted for entry on the blockchain and added to a block, potentially beside other records on that same block.
- 4** Each block contains a unique code called a hash, which identifies it and allows it to be identified and referenced by other blocks formed in the same way. Any piece of information, readable by humans, or a machine even, can be easily converted into a unique hash code. What is particularly convenient about hashes is that the entire text of a book, or the short text of a tweet, both resolve to unique hashes of the same length.
- 5** Each block identifies itself using a hash and references the hash of another block. The arrangement means that these hashes create a natural chain of blocks referencing each other, hence the term "blockchain."



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# What makes blockchain unique?

Unlike other ways of storing information, the blockchain approach has some special features that allow the information it stores to be trusted and unchangeable.

**N**odes (or parties) processing and accessing the information form naturally into a decentralized network, where decision-making and terms can be negotiated and shared equally by all parties. No central decision-making party or master exists. While this may seem like a simple concept, its implications are significant. Much of the systems we take for granted today operate on centralized principles; take banking for example, where the terms of interaction (e.g., exchange of money or value) are set by a central party. Decentralized systems enabled by blockchains offer the potential for parties to interact without the need for this without compromising trust. Trust is implicit within the system automatically, rather than having to be assigned to a single party and subsequently manipulated and abused over time in worst cases. ▶



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# What kinds of blockchain exist?

What has been described above is the purest form of blockchain, commonly referred to as a public, permissionless blockchain. This means that anyone can access that network and read its transactions.

**H**owever, other blockchain types also exist and are more suited to other kinds of use. For example, some networks should not be accessed by everyone or information should only be shared with some participants depending on the content. Such a blockchain is commonly referred to as a "permissioned" blockchain, where either access to the network, or the information stored in it, is restricted in some way. How organizations interact (e.g., across supply chains), is often suited to such permissioned access. However, by introducing permissioned access, the quality of trust and immutability is reduced as there are typically less participants in the chain enabling consensus, particularly compared to the largest public blockchains mentioned above. ●



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# BSI Blockchain

## Instruments of Trust Case Studies



CASE STUDY 1



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Author: Fred Cana, Product Manager, Knowledge Labs

# Proof of Standards Ownership

The **Knowledge Labs team** in Knowledge Solutions is using blockchain technology to record single-copy transactions made for clients that have purchased a standard from the BSI Shop.

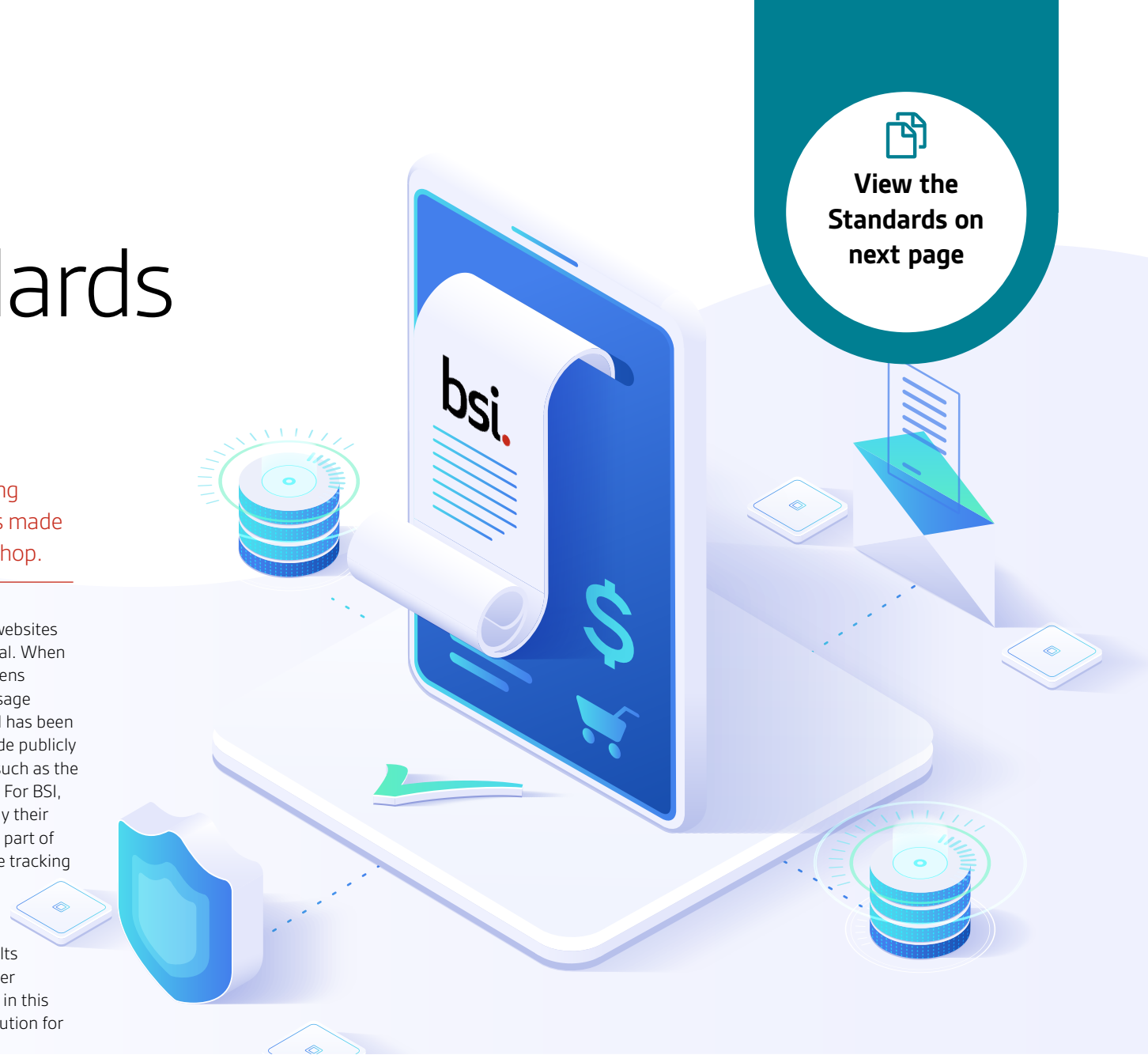


Fred Cana

Clients are required to demonstrate to their customers that they own the copyrighted version of a standard.

In order to meet job qualifications, clients must prove the copyrighted version belongs to the acquiring firm. BSI are providing a valuable solution: an immutable record of this purchase, which can be shared with clients in the knowledge that it is secure and doesn't compromise any sensitive information on behalf of BSI or the client. To describe this solution in detail; once a client has purchased a Construction or BIM standard from the BSI Shop, they will be sent a receipt in the form of a digital

badge which can be put on websites and within marketing material. When the badge is clicked on, it opens a webpage displaying a message confirming that the standard has been purchased from BSI, alongside publicly available client information such as the company name and country. For BSI, this encourages clients to buy their standards from our Shop. As part of this test, Knowledge Labs are tracking the take-up of these digital badges, as well as trying to learn what value this service brings to the client. The results of this test will inform whether using blockchain technology in this way could be a profitable solution for BSI in the future. ●



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Author: Shelley Sjerven, Program Manager, SCM

# SCAN Trusted Factory Blockchain Program

The **Supplier Compliance Audit Network (SCAN)** is an association of importers that formed to eliminate foreign factory audit fatigue associated with Supply Chain Security importing criteria within the US Customs Trade Partnership Against Terrorism program (CTPAT).



Shelley Sjerven

SCAN Importing members have a combined annual sale of \$1.25 trillion USD and source from factories around the world. More than 50% of these factories are shared by multiple SCAN members which prior to SCAN would result in a factory having regular audits by independent importers. Today, SCAN has more than 18,000 factories in the SCAN database and the program's popularity has grown internationally. Several hundred audits are conducted monthly; factories are assigned a SCAN identification

code and any CTPAT criteria gaps are met with assigned corrective actions. Due to the success of this program, some factories are making false claims that they are SCAN certified and have either created a new or copied a legitimate SCAN Factory ID number. Blockchain technology is now being incorporated into the Trusted Factory Program to ensure authenticity of a factory's certification and factory credentials. Onsite audits need to be trusted and validated for accuracy and completeness. Blockchain helps to ensure that the data



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collected has not been manipulated or fraudulently mimicked to achieve accomplishments not earned or honestly obtained. Key audit points, factory credentials, and audit indicators are stored on OriginTrail Decentralized Network and secured with blockchain. The distributed ledger with data permissioning features uses blockchain as a verified instrument of trust and can be shared with interested government agencies such as US Customs and Border Protection CTPAT program

and mutually recognized governments. The Trusted Factory Program will blockchain over 18,000 factories within the SCAN database and provide viewer rights to those permissioned members and governments. Since blockchain allows for increased transparency through an unalterable ledger, this technology helps protect against forgery, counterfeit, and other illegal or unethical practices that plague the global supply chain. ●

“Who a company selects to represent their brand is a critical decision. One must be able to trust the data and the source in which these decisions are being made, especially in these times of uncertainty. Blockchain methodology helps to provide that sense of trust and security in the data validity.”

*Shelley Sjerven, Program Manager, SCM*



“As a Tier III CTPAT business partner The Home Depot continually strives for improvements in its supply chain security platform. Membership in SCAN has delivered both an effective platform as well as cost savings through the use of shared audits. Adding a secured block chain element over the top of the SCAN audit only increases the security and integrity of these audits! With the intention of this level of integrity and security leading to a “trusted factory” program with the various regulatory agencies further costs should be driven out of the supply chain.”

*Ken McElroy, Mgr. Global Trade Risk, The Home Depot*



**View scan examples on next page**



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**SCAN 2020 SECURITY AUDIT**  
**Acme Manufacturing**  
 Audit Date: Sep 8, 2020 | Audit Status: **Reviewed**  
 Audit number: CAC-2019-08-0142-V1 | Audit category: Acme Inc.

**Verification**

- ✓ Verifying audit issuer
  - ✓ BSI identity verified
  - ✓ BSI signature verified
- ✓ Verifying audit integrity
  - ✓ Data model verified
  - ✓ Dataset replication on OriginTrail Decentralized Network verified
  - ✓ Local data hashes computed
  - ✓ Match of local and blockchain data hashes established
- ✓ Verifying audit revocation status

**Audit is valid!**  
 Audit data is published on OriginTrail Decentralized Network, and fingerprint of the data is anonymously stored on Ethereum blockchain.  
 Last validated on Mar 2, 2020

**Geographic Risk Overview**

Elevated	Quarantined	Low
<p><b>Isolated Large Population</b></p> <p>China has a central located area of concentrated large population. This area is highly populated and has a high density of people. This area is highly populated and has a high density of people.</p>	<p><b>Isolated Large Population</b></p> <p>The threat of terrorism in China is high. The major terrorist groups operating in China include the Xinjiang Uyghur Autonomous Region and the Eastern Turkistan Islamic Movement, which has been known to be associated with al-Qaeda and the Islamic Movement of Uzbekistan. This information is also on the list in China.</p>	<p><b>Isolated Large Population</b></p> <p>Proxies located outside the country in the country generally build a link to the country. This is done to avoid detection of police, private citizens and other entities. This is done to avoid detection of police, private citizens and other entities.</p>

**Audited Company Information**

Company Name	Scan ID	File	Country
Acme Manufacturing	SC1226381	Fuzhou	China

Number of facilities: 15 | Employees: 300 | Other: 423 Participants: Yes

**SCAN 2020 SECURITY AUDIT**  
**Acme Manufacturing**  
 Audit Date: Sep 9, 2020 | Audit Status: **Reviewed**  
 Audit number: CAC-2019-08-0142-V1 | Audit category: Acme Inc.

**Verification**

- ✓ Verifying audit issuer
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 Last validated on Mar 2, 2020



Author: Richard Keown, Group Training Director, and Julie Skinner, Head of Global Training Systems

# Training Certificate Proof of Credentials

Each year BSI trains and certifies more than 200,000 students, from business improvement to environmental management.



Richard Keown



Julie Skinner

BSI Training is now implementing a blockchain-backed solution that allows our clients to demonstrate their personal credentials and professional qualifications upon completing BSI training courses. This is yet another example of protecting BSI digital assets, which also gives our trainees another level of verification of their qualification(s). This blockchain training solution allows for faster and more efficient verification available to clients and third parties. Additionally, employers can easily verify the credentials of potential candidates.

The trainee receives a link and a QR code when they receive their certificate, which can be shared with third parties. The viewer can click on the link or scan the QR code to verify key certificate information which is held on the

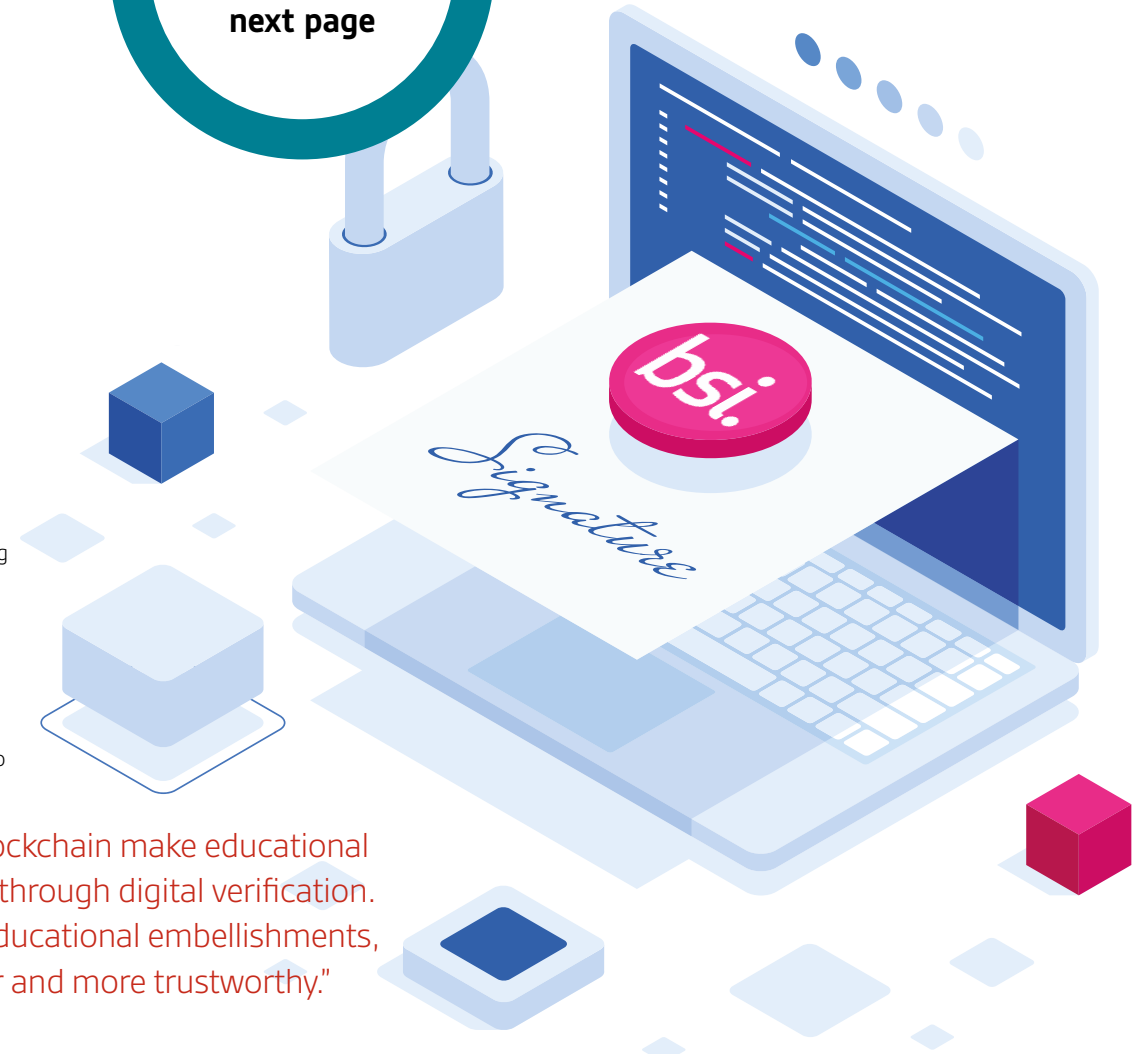
permissionless public blockchain. The link takes them directly to a verification screen, while the QR code takes them to a screen on BSI's website to enter additional criteria (on the certificate) to be taken to verification. This is enabled by placing a record on the blockchain when the certificate is issued. As a result, the shared database cannot be tampered with. This blockchain proof of credentials procedure allows a new form of trust and verification for training certification at BSI. We are excited to not only share our expert knowledge through our training courses, but also provide an additional level of trust. ●

*"Instruments of trust such as blockchain make educational and credential checks seamless through digital verification. This eliminates false claims or educational embellishments, making the hiring process easier and more trustworthy."*


**Richard Keown, Group Training Director**




View training certificates on next page



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...making excellence a habit.™

TRAINING CERTIFICATES



DOWNLOAD ▾

SHARE ↗



**This certificate is valid!**

The certificate data is published on OriginTrail Decentralized Network, and fingerprint of the data is anonymously stored on Ethereum blockchain.

**Verifying certificate issuer**

- ✓ BSI identity verified
- ✓ BSI signature verified

**Verifying certificate integrity**


- ✓ Data model structure verified
- ✓ Dataset replication on OriginTrail Decentralized Network verified
- CHECK ON ODN
- ✓ Local data hash computed
- ✓ Dataset merkle root computed
- ✓ Match of local and blockchain data hashes established
- CHECK ON ETHERSCAN

**Verifying certificate expiration status**

**Certificate is valid!**

Last checked 2 days ago.

VERIFY AGAIN





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# Inspiring Trust for a more Resilient World

**A**t BSI, our Innovations are directly aligned to our purpose of 'inspiring trust for a more resilient world'. BSI's Innovation team creates blockchain solutions for our clients and use this technology as an immutable source of truth. These instruments of trust serve the purpose of providing digital trust with personal credentials, corporate certifications, product certifications

## Authors:



**Dan Purtell,**  
Group Innovation  
Director



**Menka Vansant,**  
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**Seamus Galvin,**  
Innovation  
Project Manager

allowing our clients and their customers to immediately validated the authenticity of their achievements. Our blockchain roadmap is full of exciting collaborative projects that will broaden the use of this technology throughout our client's planning, manufacturing operations and global supply chains.

"In today's increasingly interconnected world, transparency and traceability throughout the supply chain is vital. This strategic partnership aims to provide our clients with the ability to demonstrate the authenticity of their compliance through the digital records of the assessments and certifications they have achieved from BSI. Ultimately building trust and confidence as consumers and business partners can easily verify the provenance of the goods and/or services they are buying."

**Howard Kerr, Chief Executive of BSI**

If you have a trust challenge or blockchain use case and would like to discuss your idea, please contact us [here](#).

## From the Trace Labs team

Trust and transparency are core to the beliefs and solutions of both Trace Labs and BSI. Our complementary approach combines state-of-the-art trust-enhancing technological capabilities and world-class assurance solutions, allowing us to jointly deliver the highest levels of trust, traceability, and transparency to clients. Going beyond the use-cases highlighted in this paper, Trace Labs and BSI are continuously working on delivering new solutions. Together we enable organisations to become more resilient, knowledge-driven, and innovative.

## Trace Labs:



**Tomaž Levak,**  
Co-Founder  
& Managing  
Director



**Žiga Drev,**  
Co-Founder  
& Managing  
Director



**Branimir Rakić,**  
Co-Founder &  
Chief Technology  
Officer



**Jurij Skornik,**  
General Manager