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NUI Galway
OÉ Gaillimh

Organisational factors that influence
Blockchain adoption
in Ireland



BAI
BLOCKCHAIN ASSOCIATION
OF IRELAND

A study by J.E. Cairnes School of Business & Economics in conjunction with the Blockchain Association of Ireland

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Introduction

The National University of Ireland Galway (NUI Galway) has conducted a study into key organisational factors that influence Irish companies to adopt blockchain. The study was led by Dr Trevor Clohessy and Dr Thomas Acton (J.E. Cairnes School of Business & Economics) and was conducted in conjunction with Reuben Godfrey (co-founder of the Blockchain Association of Ireland (BAI)).

A link to the study will be uploaded on the following page:

http://www.nuigalway.ie/about-us/news-and-events/news-archive/2018/april/blockchain-the-new-kid-on-the-irish-technology-block.html?utm_source=dlvr.it&utm_medium=twitter

Target Audience

The study will be useful to anybody that has an interest in blockchain and technological innovation, as well as CEOs/business leaders, policy-makers/government bodies, education providers and researchers in organisational and management science.

Objective

The objective of the study is to investigate the influence of the following three organisational factors on blockchain adoption in Irish companies:

- (1) top management support;
- (2) organisational size, and
- (3) organisational readiness.

The analysis enables a better understanding of the reasons for blockchain adoption or non-adoption in Irish enterprises, as well as the decision-making process itself.

The study investigates why blockchain implementation in Ireland is relatively low today and proposes methods to increase blockchain awareness and adoption going forward.

Methodology

Innovation theory, which has been used extensively to examine the adoption of Information Technology (IT) innovation by organisational researchers, is used to investigate blockchain adoption in Ireland (blockchain is considered to be one of the primary IT innovations of this decade).

Drawing on the technology-organisation-environment (TOE) framework, the research adopts an organisational perspective (often viewed as the most significant determinants of IT innovation adoption in enterprises), namely, *“how do organisational factors influence blockchain adoption in Irish companies”?*

The research followed a multiple-case study approach in order to provide real-world context. 20 case organisations were selected using literal and theoretical replication. The researchers carried out semi-structured interviews with representatives from each case organisation as the primary data collection method. The representatives came from different management backgrounds and included IT managers, company owners, researchers and directors.

The case organisations were all located in Ireland and were divided over different sectors (e.g. financial, IT, education, fishing, gaming, legal, marketing and mobile app development). The research was focused on Ireland given its classification as a developed country in the European Union (meaning, in this context, a sovereign state with a highly developed economy and advanced IT infrastructure).

Further, Ireland is ranked in 13th place in the Bloomberg technological innovation index for 2018 (the index scores countries using seven criteria, including research and development spending, concentration of high-tech public companies and patent activity (Jamrisko and Lu, 2018)). The study may therefore be useful for other developed countries wishing to examine blockchain adoption in their own jurisdictions.

Executive Summary

The analysis revealed three patterns pertaining to the adoption of blockchain in Ireland: (1) top management support **positively influences** blockchain adoption; (2) large enterprises are **more likely** to adopt blockchain than SMEs, and (3) organizational readiness is an **'enabler'** for blockchain adoption.

The study suggests **low levels of blockchain adoption** in Irish companies to date. Of the 20 companies involved, 8 had adopted blockchain and 12 had not or did not intend to adopt blockchain in the next 2 years.

In terms of **blockchain awareness**, 5 out of 20 representatives had a basic level of blockchain awareness, 6 had a medium level of awareness and only 9 informants were able to demonstrate that they had a high level of blockchain awareness.

Definitions

Blockchain: Blockchain in its simplest form is a shared digital ledger which allows users in a peer-to-peer network to verify and store records. Blockchain represents a new way to access and trust data communicated over the internet. Blockchain transactions can include the exchange of data such as personal identification records, and assets such as ‘tokens’ and digital currency. Instead of keeping data centralised in a traditional ledger, these new digital systems use independent computers, often referred to as ‘nodes’, to record, synchronise and share individual transactions in their respective electronic ledgers.

Blockchain awareness: (1) *Basic level* – the informant has heard about blockchain technology but is unable to adequately describe the concept; (2) *Medium level* – the informant has heard about blockchain technology and is able to give an accurate description, and (3) *High level* – the informant is able to give a correct description of blockchain technology and can provide real world examples of blockchain applications.

IT innovation: IT innovation can be defined as the application of a new IT by an organization, individual or unit. Blockchain is considered to be a primary IT innovation of this decade that has the potential to disrupt and reshape a number of industries.

Organisational readiness: organizational readiness is defined as the availability of (a) employees with the requisite IT knowledge and skills, (b) financial resources for adopting IT innovations (e.g., IT budget), and (c) infrastructure on which blockchain applications can be built.

Organisational size: simplified classifications were used for this study. *SMEs*, with 1-249 employees (micro, small and medium enterprises) and *large enterprises*, with ≥ 250 employees.

Top management support: managerial beliefs about technological initiatives, participation in those initiatives, and the extent to which top management advocates technological advancement.

Findings

- Key decision-makers play a significant role in deciding whether an organisation adopts or does not adopt blockchain technology (management acts as an enabler for the adoption of IT innovations). All of the representatives from the adopting companies were directly involved in and/or responsible for IT budget allocation to research and development (R&D) activity. **The representatives indicated that prior to the adoption of blockchain, these organizations had devoted substantial resources and budget to R&D in the blockchain space.**

- More large enterprises than SMEs have adopted blockchain technology to date. For the 5 adopting large enterprises, blockchain technology is a top IT budget priority for the next 3-5 years. **Interestingly, all of the adopting large enterprises are using privately permissioned blockchain applications which carry advantages such as tighter control and security mechanisms.**
- **Reducing complexity and lowering supply chain investment costs** associated with traditional supply chain transactions were some of the key drivers for blockchain adoption, as well as a desire to benefit from **enhanced security, efficiency and transparency** which is associated with blockchain transactions.

- Conversely, the **complexity of a large-scale digital transformation**, i.e. migration from traditional centralised systems to decentralised systems, led other organisations to reject blockchain.
- Greater business use (i.e. larger supply networks for larger companies) and a willingness to engage in IT experimentation (based on greater financial resources, infrastructure and skilled employees) led to a **higher number of large enterprises adopting blockchain**.

- Enterprises with sufficient organisational readiness for IT innovation (which includes satisfactory levels of financial resources, staff competence and access to IT infrastructure) are more likely to adopt blockchain. **The complex nature of blockchain skills and competencies was cited as a major barrier to adoption by both non-adopting SMEs and large enterprises.**

Challenges

The NUI Galway study demonstrates a relatively low blockchain adoption level among Irish enterprises today (40% adoption rate).

- Today, the majority of blockchain developments are taking place within a small network of organisations (typically in the financial technology (“fintech”) sector). A report by the Irish Development Authority (IDA) in 2017 (<https://www.idaireland.com/newsroom/publications/irelandforfintech>) promoted Ireland as a European location for fintech and blockchain. The benefits of blockchain are not confined to fintech however, and the NUI Galway research welcomes further government action and strategic policy to promote blockchain more broadly and encourage universal engagement (for instance, roll-out of a national, government-backed blockchain initiative like certain other developed countries).

The NUI Galway study shows that most representatives had heard of blockchain technology but were unable to provide a correct description and/or examples of real world blockchain applications. There was consensus that there was a low level of blockchain awareness demonstrated by counterparties that they were dealing with on a day-to-day basis.

- A separate study conducted by PWC (<https://www.pwc.ie/survey/2017-fintech-survey.html>) of 1300 Irish business leaders found that only 14% of respondents were either very or extremely familiar with blockchain, compared to 24% globally. The research suggests that there is a need to equip managers with the knowledge and skills required to engage with this technology and the findings may encourage IT and education providers to design programmes and curriculums that expedite the learning process.

Top management support is an ‘enabler’ for blockchain adoption. Management may adjust their attitude towards a particular blockchain project throughout the implementation phase. Issues relating to training, resources, trading partners and legislation frequently arise.

- In 4 of the non-adopting cases, the study revealed that decision makers were influenced by legislative uncertainty with regards to blockchain and the need for cross-jurisdictional cooperation in order to migrate to decentralised models. There was appetite for the Irish government to lead the way and signal their endorsement of the technology by way of a global statement or roll-out of a national use case. The research calls for collaboration and more dialogue between private and public-sector organisations, in order to build a knowledge bank which both sectors can readily access.

16 informants believe that the association with ‘cryptocurrencies’ and/or ‘virtual currencies’ has given the technology a negative connotation (e.g. ponzi schemes, unregulated ecosystem, illicit transactions and fraud).

- This important finding highlights the need for further ‘demystification’ of blockchain so that companies can embrace the technology in full confidence and without fear of reprimand. The research pushes for ‘*a national awareness of what blockchain is and is not*’ in order to achieve the necessary levels of trust.

The perception of complexity emerges as a significant barrier to blockchain adoption by both SME and large enterprises.

- The 2017 IDA report suggests that Ireland's IT workforce possess core foundational software development skills which can be leveraged by organizations to capitalise on the emergence of blockchain innovations. Recognising that the competencies required for blockchain technologies are broader than those required for traditional/core technologies, the NUI Galway study is confident that Ireland can bridge the skills-gap by tailoring professional certifications and offering university 'add-on' courses and standalone modules.

Conclusion

Blockchain's transformative potential:

- A recent BAI event (<https://www.blockchainireland.org/news/baiics-conference>) highlighted the vast opportunities that this technology brings to the global economy: *“Blockchain has the potential to change the way that we do business across all sectors and now is the time for Ireland and Irish-domiciled enterprises to engage with this rapidly-advancing technology and explore the viability of adopting Blockchain systems and applications in their business models and strategies going forward”*.
- What can we do?

Policy-makers/government bodies: action is required to encourage universal participation and facilitate open, cross-sectoral dialogue which will increase blockchain awareness in Ireland. We need clear direction and confidence-building from public bodies. Positive steps already taken include:

- Declaration on the establishment of a European Blockchain Partnership, signed in April 2018 by 22 European countries (including Ireland), which signals an ‘enabling’ environment for blockchain initiatives, ‘*in full compliance with EU laws and with clear governance models that will help services using blockchain to flourish across Europe*’ (<https://ec.europa.eu/digital-single-market/en/news/european-countries-join-blockchain-partnership>).
- IFS 2020 Action Plan (Strategic Priority #3 calls out blockchain) (<http://www.finance.gov.ie/wp-content/uploads/2018/01/180130-IFS2020-Action-Plan-2018.pdf>).
- Recent discussion paper by Department of Finance on “Virtual Currencies and Blockchain Technology” (<http://www.finance.gov.ie/wp-content/uploads/2018/03/Virtual-Currencies-and-Blockchain-Technology-March-2018.pdf>).

IT/Education providers need to do more to ‘de-mystify’ Blockchain and expedite the learning process nationally.

- The JE Cairnes School of Business and Economics at NUI Galway is currently exploring various possibilities to address the gap in the lack of university level blockchain courses, such as creating executive blockchain workshops. Dr Clohessy has also introduced blockchain as a topic for students within the modules for MSc Business Analytics and MSc Information Systems Management.

Business leaders have a key role in positioning Irish business at the forefront of this innovative technology.

- Top management support and organisational readiness is key to blockchain adoption: make it a priority.
- Allocate financial resources and focus on talent management/development.
- Conduct an analysis in order to determine whether Blockchain works for your business (certain business models may operate more efficiently on traditional technologies).
- Explore business use cases. *Blockchain: a viable way to Brexit-proof your business?*

About NUI Galway

The University was established in the heart of Galway City, on the west coast of Ireland, in 1845. Since then it has advanced knowledge teaching and learning, through research and innovation, and community engagement.

Over 18,000 students study at NUI Galway, where 2,600 staff provide the very best in research-led education.

NUI Galway's teaching and research is recognised through its consistent rise in international rankings. The University is placed in the Top 250 of both the Times Higher Education (THE) World University Rankings 2016/2017 and the QS World University Rankings 2016/17.

With an extensive network of industry, community and academic collaborators around the world, NUI Galway researchers are tackling some of the most pressing issues of our times. Internationally renowned research centres based here include the Whitaker Institute, CÚRAM Centre for Research in Medical Devices, Insight Centre for Data Analytics, Moore Institute, Institute for Life course and Society and The Ryan Institute for Environmental, Marine and Energy.

NUI Galway has been listed as one of the most beautiful universities in Europe according to Business Insider. For more information visit www.nuigalway.ie or view all NUI Galway news here: <http://www.nuigalway.ie/about-us/news-and-events/>