

PhD Course DRL028: Blockchain Applications in SCM

Due to Corona restrictions the course will be offered as an online-course with video communication.

Course code:	DRL028
Course name:	Blockchain applications in SCM
Program of study:	PhD in Logistics
Campus:	Molde, Norway
Credits:	5 ECTS
Course content:	Presenting research on: <ul style="list-style-type: none"> • The use of blockchain technologies in supply chain management • Paradigms for information sharing in supply chains and common ways of applying blockchain in supply chains • How to write academic papers on the application of blockchain in supply chain management
Teaching semester:	Fall 2020, Week 49, November 30 – December 4.
Required prerequisite knowledge:	Accepted as a PhD student in supply chain management program, information systems program or similar. Pre-course preparation by reading papers provided upon registration and well as completing a questionnaire to be handed in before the course start.
Learning outcome:	<ul style="list-style-type: none"> • Ability to discuss different paradigms for information sharing in supply chains using blockchain technologies • Ability to discuss blockchain governance – who makes decisions for a blockchain • Ability to present basic designs of blockchain applications for supply chains • Ability to write academic papers on blockchain applications in supply chain management based on suitable research methods • Ability to understand research approaches, skills and importantly an ability to apply them in your research
Working and learning activities:	Lectures, presentation of research papers, organised development of your research ideas into a paper on application of blockchain technologies.
Curriculum:	A set of research papers and handouts.
Mandatory coursework	Three mandatory tasks must be completed to receive ECTS points. (1) Pre-course submission of a completed questionnaire. (2) Attendance at all lectures. (3) Development of a research paper draft
Assessment	Presentation of the research paper draft
	Duration: One week
	Grading scale: Pass / Fail

Course description

There has been a dramatic increase in academic and supply chain management interest in blockchain technologies. As innovations and value creation increasingly involve business-to-business operations, technology solutions for inter-organizational business operations are needed. Standard commercially available off-the-shelf (COTS) software does still not exist for inter-organisational processes. The complexity of global business networks and its multi-faceted governance structures makes interoperability across organisations a challenging task. A core challenge is exchange of sensitive information. Exchanging digital information results in several instances of the information. Thus, each party must *trust* other parties not to share sensitive information further. Even if the access is trusted, organisations face a risk that the receivers of the sensitive information distribute the information without

their consent, resulting in a low willingness to share sensitive information (Fawcett et. al. 2007, Prajogo and Olhager, 2012). The Bitcoin blockchain technology that emerged in 2008 solved the double-spending problem that had been a major obstacle to peer-to-peer electronic cash systems (Nakamoto, 2019). The bitcoin is electronic information. Therefore, the question was soon raised whether the solution could be used to alleviate the risks of information sharing in general in a manner that had not been possible before (Dujak and Sajter 2019; Zhao et. al., 2016). If the answer is yes, sharing of sensitive information via blockchain technology can drastically improve inter-organisational processes. Today, after substantial research on the blockchain concept, it is likely that the answer is yes: blockchain technologies have the potential to improve inter-organisational information exchange (Hughes et. al. 2019). Blockchains have great value as the technology challenge established theories and applications on information sharing and supply chain management.

This PhD-course will present current research on blockchains in supply chains and offer an opportunity to discuss future applications and research on this topic. By the end of the course, you should be able to prepare a research proposal with appropriate research design, measurement and consideration of ethical issues for your research.

Lecturers

[Nitin Vasant Kale, Professor of Information Technology Practice, University of Southern California, USA](#)

[Arvind Upadhyay, Senior Lecturer, Brighton Business School, UK](#)

[Svein Ølnes, Researcher, Western Norway Research Institute, Norway](#)

[Bjørn Jæger, Associate Professor, Molde University College, Norway](#)

PhD Course Week

Mon May 4 th	- Introduction to blockchains in supply chain management
Tue May 5 th	- Blockchain concepts - Paper walkthrough & discussion - Group work: Select a problem for an academic paper
Wed May 6 th	- Blockchain concepts in Supply Chains - Blockchain governance - Paper presentations & discussion - Group work: Work on the selected research problem
Thu May 7 th	- Blockchain concepts in Supply Chains - Paper presentations & discussion - Paper walkthrough & discussion - Group work continued
Fri May 8 th	- Presentations of research paper draft - Research profile for each PhD student - Summary

Literature

Introduction to blockchains

Hughes, L., Dwivedi, Y. K., Misra, S. K., Rana, N. P., Raghavan, V., & Akella, V. (2019). Blockchain research, practice and policy: Applications, benefits, limitations, emerging research themes and research agenda. *International Journal of Information Management*, 49, 114-129.

Nakamoto, S. (2009). Bitcoin: A peer-to-peer electronic cash system. Manubot.

Yli-Huumo, J., Ko, D., Choi, S., Park, S., & Smolander, K. (2016). Where is current research on blockchain technology?—a systematic review. *PloS one*, 11(10), e0163477.

Ølnes, S., Ubacht, J., & Janssen, M. (2017). Blockchain in government: Benefits and implications of distributed ledger technology for information sharing.

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Fawcett, S. E., Osterhaus, P., Magnan, G. M., Brau, J. C., & McCarter, M. W. (2007). Information sharing and supply chain performance: the role of connectivity and willingness. *Supply Chain Management: An International Journal*, 12(5), 358-368.

Iansiti, M., & Lakhani, K. R. (2017). The truth about blockchain. *Harvard Business Review*, 95(1), 118-127.

Prajogo, D., & Olhager, J. (2012). Supply chain integration and performance: The effects of long-term relationships, information technology and sharing, and logistics integration. *International Journal of Production Economics*, 135(1), 514-522.

Zhao, J. L., Fan, S., & Yan, J. (2016). Overview of business innovations and research opportunities in blockchain and introduction to the special issue. *Financial Innovation*.

Dujak, D., & Sajter, D. (2019). Blockchain applications in supply chain. In *SMART Supply Network* (pp. 21-46). Springer, Cham.

Jæger, B., Bach, T., & Pedersen, S. A. (2019, September). A Blockchain Application Supporting the Manufacturing Value Chain. In *IFIP International Conference on Advances in Production Management Systems* (pp. 466-473). Springer, Cham.

Lacity, M. C. (2018). Addressing key challenges to making enterprise blockchain applications a reality. *MIS Quarterly Executive*, 17(3), 201-222.

Tian, F. (2016, June). An agri-food supply chain traceability system for China based on RFID & blockchain technology. In *2016 13th international conference on service systems and service management (ICSSSM)* (pp. 1-6). IEEE.

Upadhyay, A., Sumone M., Vikas K., and Yigit, K. (20xx, forthcoming) Blockchain-Based Smart Contracts: The Evolution of Trust in Business Transactions? In review process JCLP.

Wang, Y., Singgih, M., Wang, J., & Rit, M. (2019). Making sense of blockchain technology: How will it transform supply chains? *International Journal of Production Economics*, 211, 221-236.

Research Methodology

Saunders, M., Lewis, P., and Thornhill, A. (2019). *Research Methods for Business Students*. Pearson Publishers.

Easterby-Smith, M., Thorpe, R., Jackson, P., and Jaspersen, L. (2018). *Management and Business Research*. Sage Publishers.