

Blockchain for Transparency, Traceability, and Sustainability: Insights from the Danish Design and Trade Industry



LEDELSESRESUME

- Denne rapport er et af resultaterne fra projektet **Avanceret Blockchain I Dansk Design**, som er støttet af Industriens Fond i tæt samarbejde ml. Copenhagen Business School, DI Handel og Lifestyle Design Cluster
- Rapporten præsenterer svarerne fra et spørgeskema besvaret af 101 danske design- og handelsvirksomheder.
- Undersøgelsen fokuserer på **5 områder**: 1) Relevans af gennemsigtighed, sporbarhed og bæredygtighed i forsyningskæden; 2) Udfordringer i forsyningskæden; 3) Forandringsfaktorer for gennemsigtighed, sporbarhed og bæredygtighed; 4) Kendskab til blockchain teknologi; 5) Nuværende og fremtidig anvendelse af blockchain teknologi.
- Danske design- og handelsvirksomheder tildeler de tre dimensioner: **Gennemsigtighed, sporbarhed og bæredygtighed** meget høj relevans i både den bagud- og fremadrettede forsyningskæde.
- Danske handels- og designvirksomheder anser **bæredygtighed for at være den mest relevante** af de tre dimensioner.
- **81%** af Danske design- og handelsvirksomheder er i stor eller meget stor grad **villige til at dele data** med bæredygtighed som formål.
- Danske design- og handelsvirksomheder svarer at de største udfordringer i forsyningskæden udgøres af **produkters påvirkning af miljøet og kopivarer i omløb**.
- Den største forandringsfaktor for danske design- og handelsvirksomheder til gennemsigtighed, sporbarhed og bæredygtighed i forsyningskæden kommer fra forretningshensyn (som f. eks omkostningsreduktion, branding og stræben efter konkurrencefordele) (64,4%), mens den svageste forandringsfaktor er hensyn til eksisterende lovgivning.
- **77%** af respondenterne angiver begrænset eller **ingen kendskab til blockchain teknologiens potentiale** i deres virksomhed.
- **30%** af de danske design- og handelsvirksomheder **ved ikke hvorvidt blockchain teknologi kan understøtte** at deres forsyningskæde bliver mere gennemsigtig, sporbar og bæredygtig.
- **Kun 4%** af danske design- og handelsvirksomheder **anvender blockchain i deres forsyningskæde**, og kun 6% har en konkret plan om at indføre blockchain teknologi.

EXECUTIVE SUMMARY

- This report is one of the outputs of the **Advancing Blockchain for Danish Design (ABCD)** project, supported by the Danish Industry Foundation in close cooperation between Copenhagen Business School, DI Handel and Lifestyle & Design Cluster
- The report presents results of an online survey on **101 Danish design and trade companies**
- The survey focuses on **five areas**: 1) Relevance of transparency, traceability, and sustainability in the supply chain; 2) Challenges in the supply chain; 3) Drivers of transparency, traceability, and sustainability in the supply chain; 4) Awareness of blockchain technology; 5) Current and planned use of blockchain technology.
- Danish design and trade companies attribute very high relevance to the three dimensions of **transparency, traceability, and sustainability** in both the upstream supply chain and in the downstream supply chain.
- Of these three dimensions, **sustainability is considered the most relevant** one by Danish design and trade companies.
- **81%** of Danish design and trade companies are **willing to share data** for sustainability purposes either to a large or to a very large extent.
- The most relevant challenges experienced by Danish design and trade companies in the supply chain are the impact of products on the **environment** and the presence of **counterfeit goods**.
- The biggest driver of Danish design and trade companies for more transparent, traceable, and sustainable supply chains comes from their **business considerations** (such as cost reductions, branding, and the pursuit of competitive advantage) (64.4%), while the weakest driver is one of the **regulatory** requirements.
- **77%** of the respondents claim little or **no knowledge of the potential of blockchain** technology in their company.
- **30%** of the Danish design and trade companies **don't know whether or not blockchain technology can help** their supply chain to be more transparent, traceable, and sustainable.
- Only 4% of Danish design and trade companies have started to use blockchain in their supply chain, and **only 6% have a concrete plan** to adopt blockchain.

KORT OM PROJEKTET

Industriens Fond har gennem temaindkaldelsen ”Konkurrencekraft i blockchainteknologien” bevilget midler til projektet ”Blockchain i Business og Dansk Design”. Projektet er et samarbejde mellem Copenhagen Business School, Lifestyle & Designcluster og DI Handel.

Formålet med projektet er at afdække, hvordan blockchainteknologi kan understøtte øget effektivitet, gennemsigtighed og en troværdig global forsyningskæde i handel- og designindustrien. Blockchainteknologi skal være med til at autentificere produktets ægthed og verificere, at råmaterialet kommer fra en bæredygtig kilde. Projektet ønsker at give danske virksomheder, deres leverandører og kunder kompetencer til at tage strategiske beslutninger om valg, implementering og inkorporering af blockchainteknologi i deres hovedaktiviteter. Derfor har projektet til hensigt at udvikle praktiske værktøjer til danske handels- og designvirksomheder til implementering af blockchain og IoT.

Følg med i projektet på www.blockchainbusiness.dk



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1 Introduction

Blockchain technology is swiftly expanding its scope of potential use beyond the financial sector (e.g., Bitcoin), to include an increasing array of new areas of business value. Among these areas, supply chain management is a very important one. Blockchain technology has the potential to improve the levels of transparency of supply chains; to enhance the ability to trace products as they travel along with them; and to enhance their sustainability by, for instance, allowing stakeholders to verify the source of a product, and enabling the re-use of products at the end of their lifecycle (i.e., circular economy).

In the global marketplace, it is becoming more complex to manage and support product lifecycles as many products are purchased, produced, sold, consumed, and recycled globally.

The design industry, defined as including furniture and textile companies, is a flourishing one that is nevertheless facing challenges in an era of digital transformation. For instance, consumers increasingly look for the possibility to verify the authenticity of branded design goods in global supply chains that are often challenged by counterfeit products; consumers want to be able to check, and possibly reduce, the environmental footprint of the design products; and they demand that products are sourced in a socially responsible way.

Danish design represents a flagship industry, and blockchain technology provides a unique opportunity to tackle these challenges and gain competitive advantages in both local and global markets.

This report provides findings from an initial investigation on the perceptions, needs, and uses in the Danish design industry of blockchain technology for transparency, traceability, and sustainability in the supply chain. By *transparency* in the supply chain, we refer to providing sourcing information to different stakeholders. For example, a food supply chain is transparent when it gives all stakeholders (e.g., consumers, public authorities, competitors) access to all information on food ingredients, animal welfare, etc. By *traceability* in the supply chain, we refer to the capability of tracking product origin and travel from suppliers to end-users. For example, a food supply chain is traceable when it is possible to know the exact date, time, and place where the product has changed hands between companies in the supply chain. By *sustainability* in the supply chain, we refer to considerations of the impact of the supply chain on environmental and social aspects (e.g. recycling, pollution, circular economy).

2 Methodology

An online survey was carried out to investigate the awareness and use of blockchain for transparency, traceability, and sustainability in Danish SMEs. The survey has been sent out to

904 design and trade companies, in the period from February to April 2020. Of the 150 responses (response rate 16.6%), 101 were deemed usable, and thus included in the analysis (11.2% of the total sample size). Survey data was analyzed with SPSS Statistics, and analysis visualization was carried out with the support of the Think-cell software package. A summary of the data collection is provided in Table 1 and in Figure 1.

Table 1. Summary of the survey data collection

Sector focus	Danish design & Trade industry	
Survey period	February to April 2020	
Method	Self-administered online questionnaire	
Response rate	Sample size	904
	Responses	150
	Response rate	16.6%
	Completed n	101
	n% of sample size	11.2%

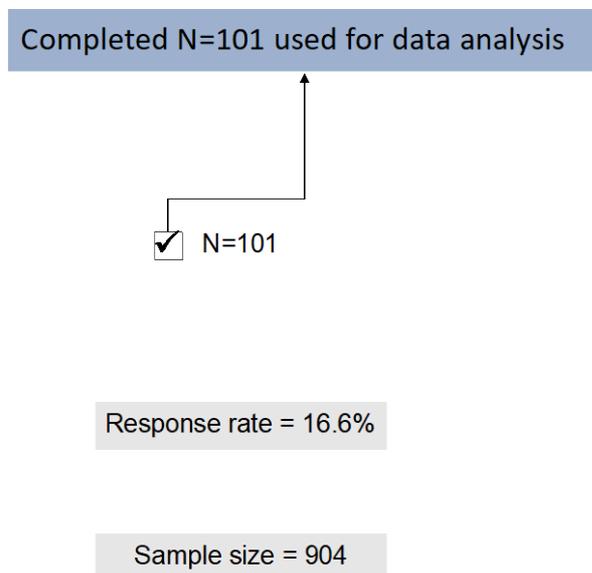


Figure 1. Survey sample size

¹ We considered usable all responses that included more than 50% of the questionnaire items filled, and excluded the rest.

The targeted respondents were brand owners or top managers, who are assumed to be most likely to know about blockchain and the adoption of blockchain in the supply chain in the company. Figure 2 summarizes the work position of the survey respondents.

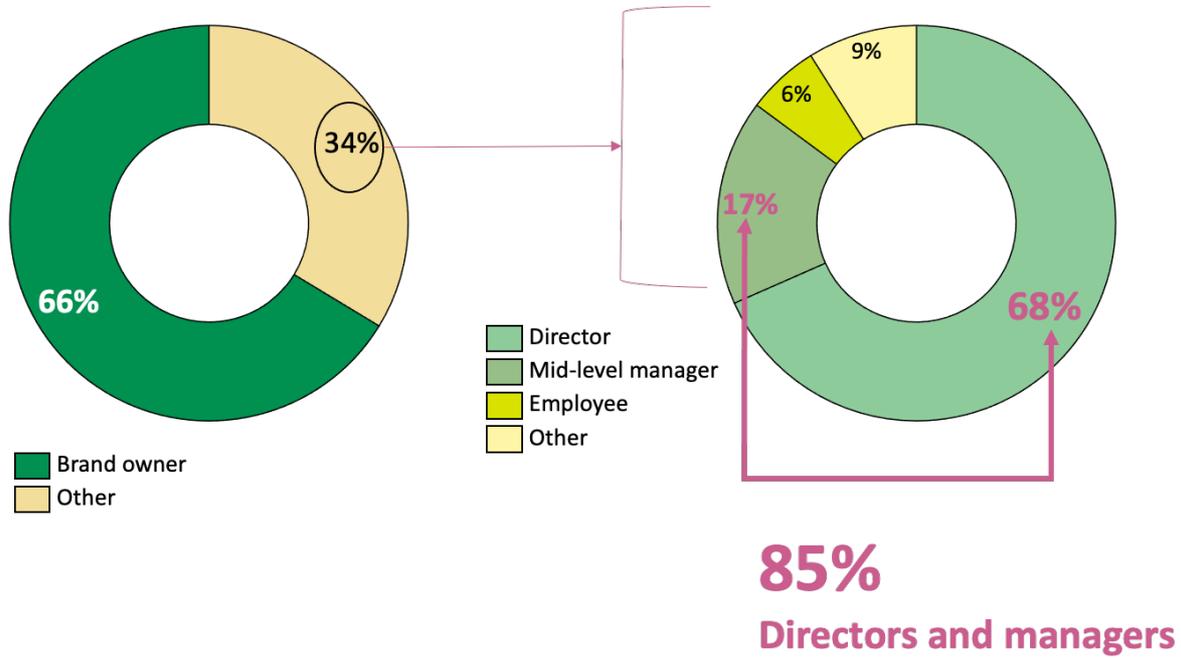


Figure 2. Respondents' work position²

Respondents are from a variety of industries linked to design. The majority of the respondents work in fashion design companies (26%), followed by furniture design companies (18%), and textile companies (13%). Other industries include building materials, interior design, food, and pharmaceutical industry. Figure 3 illustrates the distribution of respondents across different industries. The list of other industries indicated by the respondents is shown in Table 2.

² Q15. Are you a brand owner?; Q18. What is your role in the business?

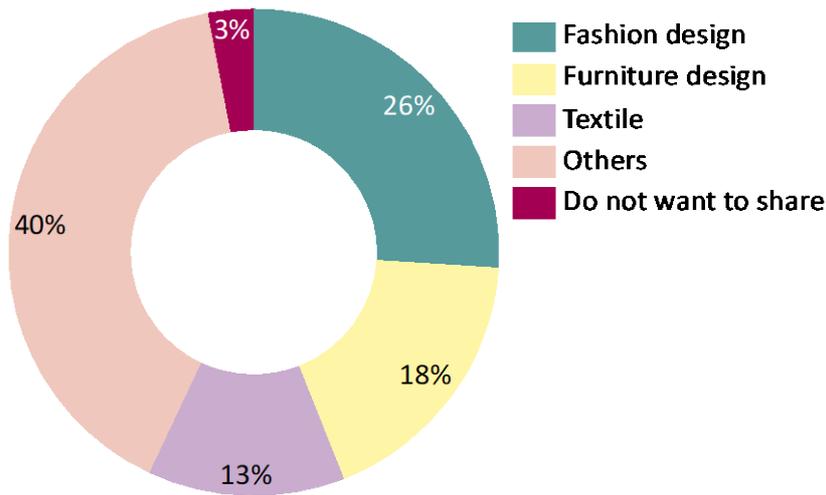


Figure 3. Industry of the respondents' companies³

Table 2. Other industries of the respondents' companies⁴

Industry	N
Building materials	6
Interior design	4
Kitchen	2
Food industry	2
Wood industry	2
Food / Pharma / Bio / Marine / General Industry	2
Baby and toy products	2
Industrial design for chemical industry	1
Metal industry	1
Packaging	1
Motorbikes and accessories	1
Education	1
Product design (wide)	1
Electromagnetic products (industrial use)	1
Healthcare/Life Science	1
Hygiene products	1
Manufacturing of electrical products	1

³ Q16. What industry are you in? (n=101).

⁴ This table presents the survey question – Q16. Q16. What industry are you in? (n=101).

<i>Industry</i>	<i>N</i>
Supplier of raw fur	1
Contracting	1
Manufacturing of plumbing and heating products	1
Workwear	1
Wood and plastic industry	1
Other	5
TOTAL	40

Among the 101 responses collected, 40% are from producers and 46% from trading companies (see Figure 4);

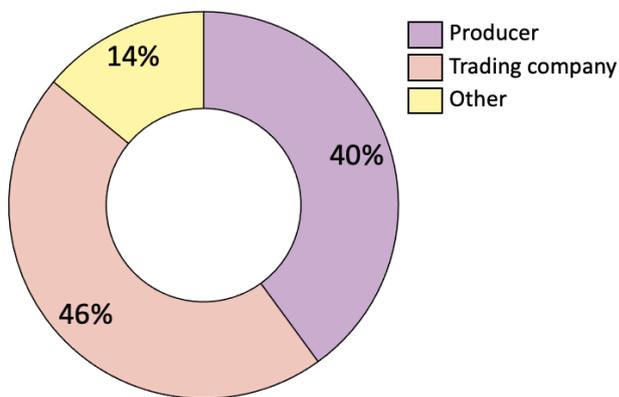


Figure 4. Core function of the respondents' companies⁵

Regarding the size of the companies, the majority of respondents are from small and medium enterprises (SMEs) with less than 50 employees, as shown in Figure 5.

⁵ Q14. What is the core function of the company?

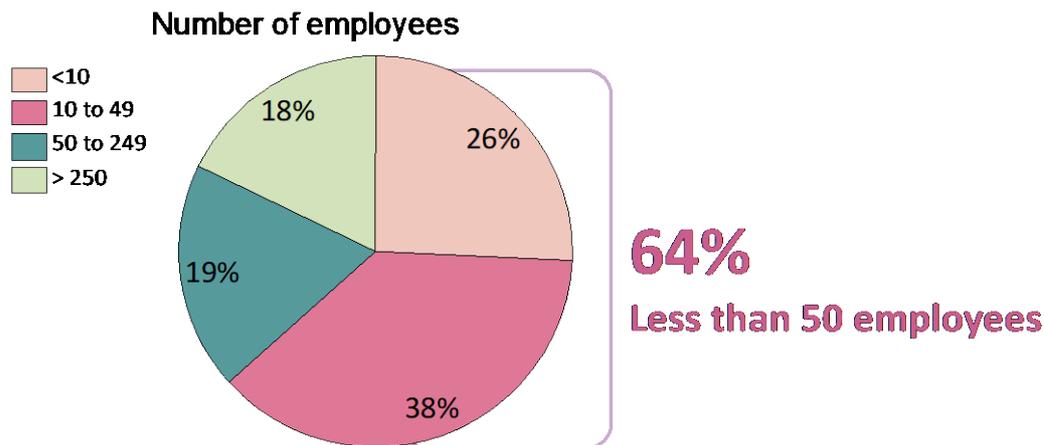


Figure 5. Respondents' company size⁶

3 Findings

The survey focused on five dimensions:

1. Relevance of transparency, traceability, and sustainability in the supply chain;
2. Challenges in the supply chain;
3. Drivers of transparency, traceability, and sustainability in the supply chain;
4. Awareness of blockchain technology;
5. Current and planned use of blockchain technology.

The first three dimensions aim at mapping the needs, challenges, and drivers of Danish design and trade companies in relation to managing their supply chain – irrespective of the specifics of blockchain technology. The last two dimensions focus on understanding the level of awareness and use of blockchain technology that Danish design and trade companies show concerning the goals of transparency, traceability, and sustainability.

In the following sections, we will present the results of the survey in each of the five dimensions.

3.1 Relevance of transparency, traceability, and sustainability in the supply chain

We first have investigated how much relevance the Danish design industry attributes to each of the three dimensions of transparency, traceability, and sustainability. We distinguished between relevance in the upstream supply chain (i.e., in the relationships between the company and its suppliers), and in the downstream supply chain (i.e., in the relationships between the company and its customers, including all possible intermediaries in between). A summary of the responses is provided in Figure 6.

⁶ Q17. How many employees are you in the company?

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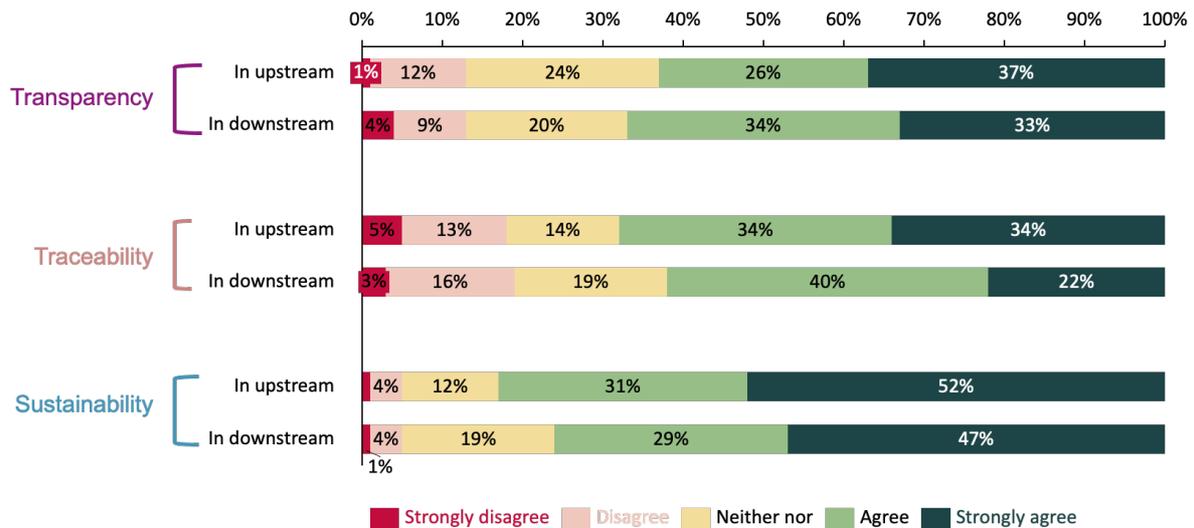


Figure 6. Relevance of transparency, traceability, and sustainability in the upstream and downstream supply chain⁷

Data shows that respondents attribute very high relevance to all three dimensions. Sustainability is considered the most relevant one, with transparency and sustainability similarly considered less relevant. While traceability and sustainability are considered more relevant in the upstream supply chain, transparency instead is considered more relevant in the downstream supply chain.

We have also asked respondents to assess their willingness to share data for each of the three dimensions of transparency, traceability, and sustainability (see Figure 7).

⁷ Note: This figure presents the answers to survey questions Q1, Q2, Q3:

Rate the following from 1 (strongly disagree) to 5 (strongly agree).

Q1. It is relevant for my business to have more transparency in the upstream supply chain (e.g., between me, my suppliers and their suppliers) / in the downstream supply chain (e.g., between my clients and I, and their clients).

Q2. It is relevant for my business to have more traceability in the upstream supply chain/ downstream supply chain.

Q3. It is relevant for my business to have more sustainability in the upstream supply chain/ downstream supply chain.

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Figure 7. Willingness to share data for sustainability, traceability, and transparency⁸

Overall, respondents show a high level of willingness to share data. Among the three dimensions, the purpose of sustainability is considered most favorably. 81% of the respondents are willing to share data for sustainability purposes either to a large or to a very large extent.

Comparing the willingness of sharing data for the three dimensions (sustainability, traceability, and transparency) with the relevance attributed to each provides interesting results.

The willingness to share data for transparency and traceability is lower than the relevance attributed to them: while a large majority agrees or strongly agrees that transparency is relevant in the upstream supply chain (62%) and the downstream supply chain (66%), only 53% of the respondents are willing to share data to a large or very large extent for this purpose; and while a large majority agrees or strongly agrees that traceability is relevant in the upstream supply chain (67%) and the downstream supply chain (61%), only 54% of the respondents are willing to share data to a large or very large extent for it.

Conversely, when respondents are asked about data sharing for sustainability purposes, the willingness of data sharing is roughly in line with the relevance attributed to it, both in the upstream (83% agreeing or strongly agreeing that transparency is relevant), and the downstream supply chain (76% agreeing or strongly agreeing that transparency is relevant).

⁸ Q1.1, Q2.1, Q3.1 Rate the following from 1 (not at all) to 5 (to a very large extent): To what extent would you be willing to share data to have more transparency, traceability, and sustainability?

Box 1 – Example of qualitative responses on the relevance of transparency, traceability, and sustainability in the supply chain⁹

In the textile industry, the supply chain is long-winded and it can be hard to trace if your cotton is harvested in Asia, Europe, Africa, India, or another location worldwide. (...) We feel, of course, that by producing 90% in Turkey/EU we have better knowledge and insight into our value chain because we are present at the factories several times a month, but you can never be sure. If we look towards Asia we do not have the same control, but can only gain insight by using external audits. That is the reason for the usage of resources to get certifications (...) Some certifications are more credible than others, but beyond the first audits that are made for a GOTS (Global Organic Textile Standard) certification, how much is actually controlled going forward? Maybe this is the fashion industry in a nutshell - We are busy communicating how great we are and how much sustainability means, but at the end of the day profit is king.

Generally, our issue is that we have some production in China and there can be problems with the production that we are not aware of and which potentially can cause us problems. On the other hand, our customers pressure the price - therefore we would like to avoid too much transparency - because it might cause them to go directly to our suppliers.

We work in remote areas and find that the data shared creates trust and benefits for the communities we work with. It also gives the audience a clear path on how we work and the efforts we make towards more sustainable practices.

Information about product origin and destination would provide me with ease when it comes to knowing more about which businesses I work for and collaborate with. I would be able to showcase this information in dialogue with customers and partners and use it in the storytelling about my product also for the end-user.

We have worked a lot with Health Product Declarations and Environmental Product Declarations to provide our customers with transparency about the contents of our furniture. We wish to further this development - the customers have a right to know what they are buying. This demand is increasing from our customers. Our biggest challenge is

⁹ Q4: Can you provide one or more examples of how it is relevant for your business to have more transparency, traceability or sustainability in the upstream supply chain and downstream supply chain?

that it is very hard to get information about contents (material, chemicals, etc.) from our suppliers and sub-suppliers.

We are a trade company and do not have our own production. It is other parameters that affect our situation, but it is important to have some extent of sustainability and responsibility to the environment in the products we offer our customers. Especially these parameters have become a big demand from our stakeholders.

As part of the fur industry, it is an impediment that there is complete transparency around which farms the animals are coming from to provide a bigger sense of trust with consumers. So we partly work with traceability and also with certification which provides credibility around the wellbeing of the animals.

Among different core functions of the companies, producers tend to have a slightly higher willingness to share data for traceability, as illustrated in Figure 8.

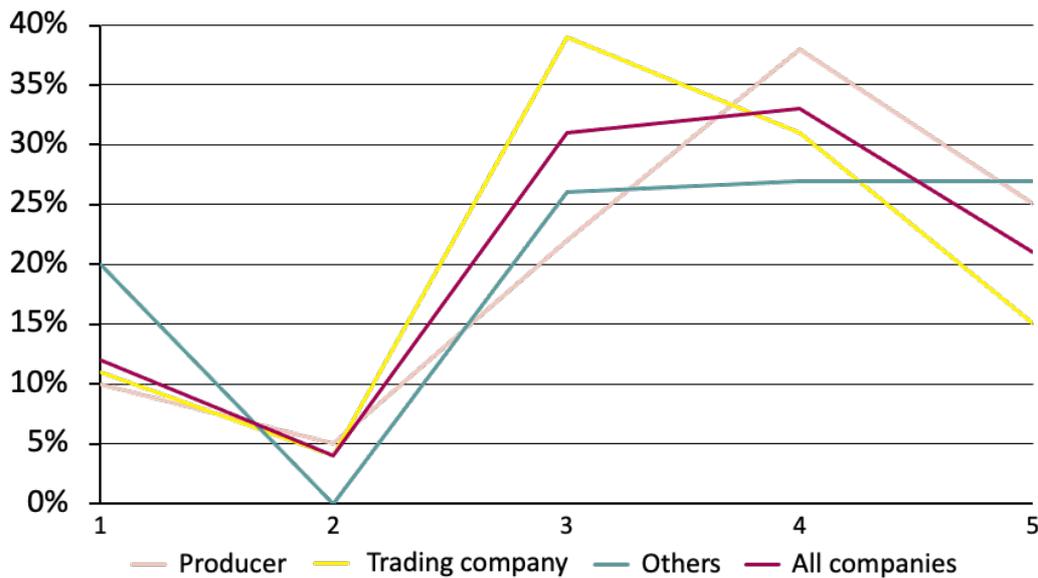


Figure 8. Willingness to share data for traceability, grouped by core function of the respondents' companies ¹⁰

¹⁰ Q2.1. Rate the following from 1 (not at all) to 5 (to a very large extent): To what extent would you be willing to share data to have more transparency, traceability, and sustainability? + Q14. What is the core function of the company?

3.2 Challenges in the supply chain

To develop an understanding of how blockchain can be used to help design companies, we focused on the challenges that the design industry meets in the supply chain. We asked respondents to evaluate the importance of the following types of challenges: the impact of products on the environment; the presence of counterfeit goods; the willingness to share data between partners in the supply chain (and lack thereof); IT security in the supply chain control systems; contract fraud in the supply chain; slow transactions in the supply chain; and excessive costs due to middlemen in the supply chain. The results are summarized in Figure 9.

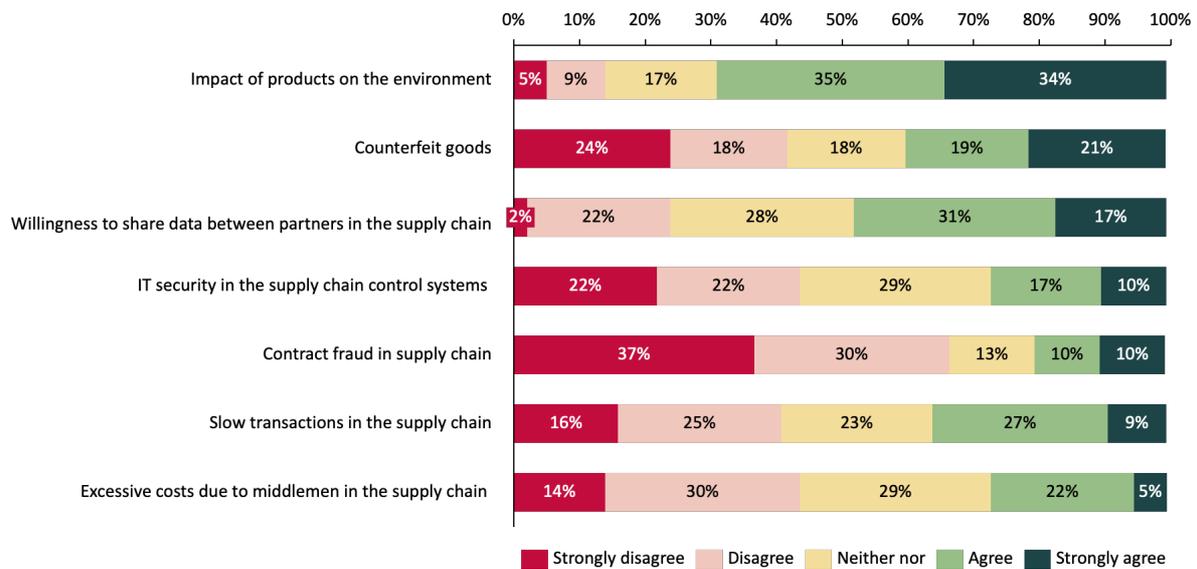


Figure 9. Perceived challenges in the supply chain¹¹

The challenge in the supply chain that respondents consider most important is the one of the impact of products on the environment, followed by the presence of counterfeit goods, and the (lack of) willingness to share data between partners in the supply chain. The high importance attributed to the impact of products on the environment as a challenge is well in line with the general consideration of sustainability as a very relevant issue in supply chains (see Figure 6). On the other hand, it is interesting to notice that respondents consider the lack of willingness to share data between partners in the supply chain as one of the most important challenges, while they display a high level of willingness to share data themselves (see Figure 7). Respondents emphasize to a less extent the importance of contract fraud, slow transactions, and excessive costs due to middlemen in the supply chain, as challenges. It is worth noting that

¹¹ Q5. Please rate the following challenge in your industry from 1 (strongly disagree) to 5 (strongly agree).

IT security is not singled out as a very important challenge in supply chains – this fact can be relevant when considering the possibility of adoption of blockchain in the supply chain.

Furthermore, respondents were asked to report on other challenges they meet beside the ones listed. The additional challenges mentioned by the companies include payment issues, culture and norms, product seasonality, “greenwashing”, paperwork, access to IT, structure of the supply chain, and lack of trust. Box 2, we report and classify some of the examples provided by the respondents.

Box 2. Examples of challenges that Danish design and trade companies meet in the supply chain¹²

Payment issues	Payment in advance for production and payment from customers and wholesale. All production implies payment in advance. And all wholesale distributors demand 30 days of grace.
Culture and norms	In Asia, there is no tradition for a transparent supply chain. That makes traceability and certification processes almost impossible and very lengthy.
	Lobbying in the field of eco-labeling means that Scandinavian labeling often is a minimum requirement in public tenders. It is a challenge that there is limited knowledge of these certifications in other parts of the world, so subcontractors’ costs and resources do not measure up to the costs of obtaining Scandinavian and European environmental certifications.
Product seasonality	Our industry is one of the biggest sinners when it comes to the environment. We mass-produce and over-produce. In our business, 20% of the yearly profit comes from the day-to-day supply in retail stores. That’s approximately 350.000 pieces a year (...) There will always be a surplus of many different styles and others will be sold out in a matter of days. But no one knows if a style will perform or not. The accumulation of old stockpile is almost impossible to sell.
“Greenwashing”	Focus on great PR instead of real action. There has to be space for differing methods (...) but instead of implementing quick fixes, which

¹² Q5.2. Can you give a concrete example of these challenges?

	do not solve anything, the industry should be more daring and start where it will have an impact.
	Nearly everyone is talking about sustainability and the term is hard to define. When is a product sustainable? Solutions with certifications help but create other problems. We cannot afford certification. There's much greenwashing and the area is hard to assess. Information availability and concrete product and material demands would help.
Paperwork	The ability for suppliers to become FSC certified. Ability to deliver surface-treated wood without solvents. Possibility to procure environmental documentation.
	Traceability for raw materials, material certificates, certificates on tests, demands for documentation between regions (Japan, China, US, EU)
Access to IT	Where or how is the data collected; in some regions, we only have mobile devices to input data.
Structure of the supply chain	Many suppliers and complex supply chain. A pair of jeans involves over 80 suppliers
	In the textile industry, the supply chain is often so complicated that it is hard to trace back more than 2-3 steps.
Lack of trust	Trust between supplier and brand is often not present to begin with, which is why the supplier will not disclose their knowledge/ data.

3.3 Drivers of transparency, traceability, and sustainability in the supply chain

The reasons why a company adopts a certain behavior can be rooted in business considerations (such as cost reductions, branding, and the pursuit of competitive advantage); in market demands; or regulatory requirements by public authorities, among others. To understand what motivates Danish design and trade companies, we have asked respondents to what extent they perceive business considerations, market demands, and existing regulation, as factors pushing them toward more transparency, traceability, and sustainability in the supply chain. Our findings are summarized in Figure 10.

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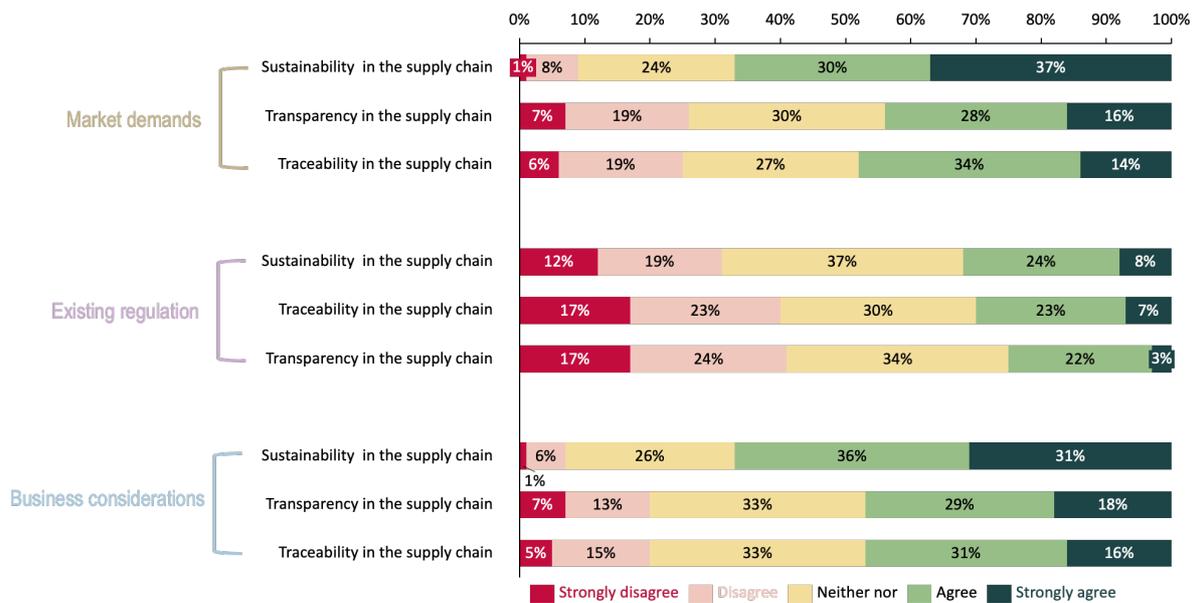


Figure 10. Drivers of transparency, traceability and sustainability in the supply chain: market demands, existing regulation, and business considerations¹³

Business considerations are considered the factor that drives the companies' quest for transparency, traceability, and sustainability the most, followed by market demands. Respondents consider existing regulation to be a rather less powerful factor in their decision to pursue transparency, traceability, and sustainability in the supply chain.

Among the three dimensions of transparency, traceability, and sustainability, all drivers are considered by the respondents to play the most important role in pursuing sustainability. 67% of the respondents either agree or strongly agree that sustainability is driven by market demands, Business considerations by a company include cost reductions, branding, and the pursuit of competitive advantage. When asked whether it is business considerations that drive companies to pursue more transparency, traceability, and sustainability in their supply chains, data shows that the dimension on which business considerations have the most impact is the one of sustainability. 64% of the companies either agree or strongly agree that business considerations drive for more sustainability, compared to the 47% that either agree or strongly agree that business considerations drive for more transparency and traceability.

¹³ Rate the following from 1 (strongly disagree) to 5 (strongly agree): Q6. Our market/ potential market demands more sustainability, transparency and traceability in the supply chain.

Q7. Existing regulations demand more sustainability, transparency and traceability in the supply chain.

Q8. Business considerations (such as cost reductions, branding, and the pursuit of competitive advantage) demand more sustainability, transparency and traceability in the supply chain.

Similarly, when asked about market demands as a driver for companies to pursue more transparency, traceability, and sustainability in their supply chains, 67% of the companies either agree or strongly agree that market demands drive for more sustainability, compared to 48% for more traceability, and 44% for more transparency,

Conversely, when asked about existing regulation as a driver, data shows that there is not such a significant difference in the relevance attributed to existing regulation as a driver to pursue more transparency, traceability, and sustainability in their supply chains. In fact, 32% of the respondents either agree or strongly agree that existing regulations require more sustainability, 30% that existing regulations require more traceability, and 25% that existing regulations require more transparency in the supply chain.

We further asked respondents to provide some examples regarding market demands, existing regulation, and business considerations as drivers for companies to pursue transparency, traceability, and sustainability in their supply chains. Box 3 reports some examples provided by the respondents.

Box 3. Examples of market demands, existing regulations, and business considerations as drivers of transparency, traceability, and sustainability in the supply chain¹⁴

Market demands	The increasing need for information by end-users before the final decision to purchase.
	Demands of “stamping” transactions not unlike procedures for some medical products.
	Customers are increasingly asking for open calculation and use it as leverage against suppliers.
	The market demands Global Organic Textile Standard (GOTS) certified products and without a certification that is hard to provide. But as a business, it is a difficult choice between different certifications. There are so many. If you are a new business, you can choose your strategy from the beginning.
Existing regulation	[Municipality X] in their new framework agreement for new workwear has set up a point system linked to the 17 United Nations Sustainable

¹⁴ Q9: Can you give one or more concrete examples of how existing regulations, business considerations and your market / potential market requires the supply chain to be more transparent, traceable and / or sustainable and responsible?

	<p>Development Goals (SDG): the more SDGs a supplier can document in their bid, the more points it will be awarded. Unfortunately, in their call for bids on workwear [Municipality X] focused more on quantity than quality in terms of SDGs, sustainability, and responsibility. [Municipality Y] has set requirements about environmental certificates generally utilized and known in the EU. However, their expectations for prices/costs are based on products produced in Asia. In general, there is a great deal of goodwill and expectation that the public sector wants the most sustainable products, but without real knowledge of the timeframe and financial capabilities.</p>
	<p>Hangtags with clear information. Regulation from the government. All import and production not following EU demands and SDG should be prohibited.</p>
	<p>There is a demand for documentation of sustainable production. But we don't see it happening with more transparency as it could damage our business.</p>
<p>Business considerations</p>	<p>Retailers and B2B customers increasingly demand sustainability and traceability/transparency</p>
	<p>Owners and investors demand better control and transparency concerning environmental, social, and governance concerns.</p>

3.4 Awareness and use of blockchain

In this section, we investigate the degree of awareness and use of blockchain technology in the supply chain for transparency, traceability, and sustainability.

As a preliminary question, we have probed to what extent respondents know about the potential of blockchain technology in the supply chain. The results are illustrated in Figure 11.

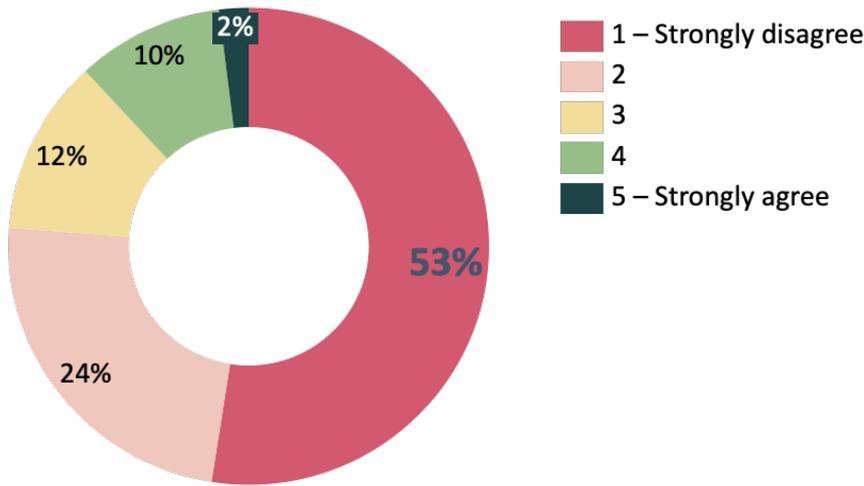


Figure 11. Knowledge of the possibilities for the use of blockchain in their companies¹⁵

The striking result is that a vast majority of respondents claim to have little or no knowledge of such potentials. Only 2% of the respondents completely agree with the statement “I know the possibilities for the use of blockchain in my company”, as opposed to 77% that claim no knowledge (53% strongly disagree, and 24% disagree with the statement).

Respondents from larger companies show a slightly higher level of knowledge of the possibilities for the use of blockchain, as illustrated in Figure 12.

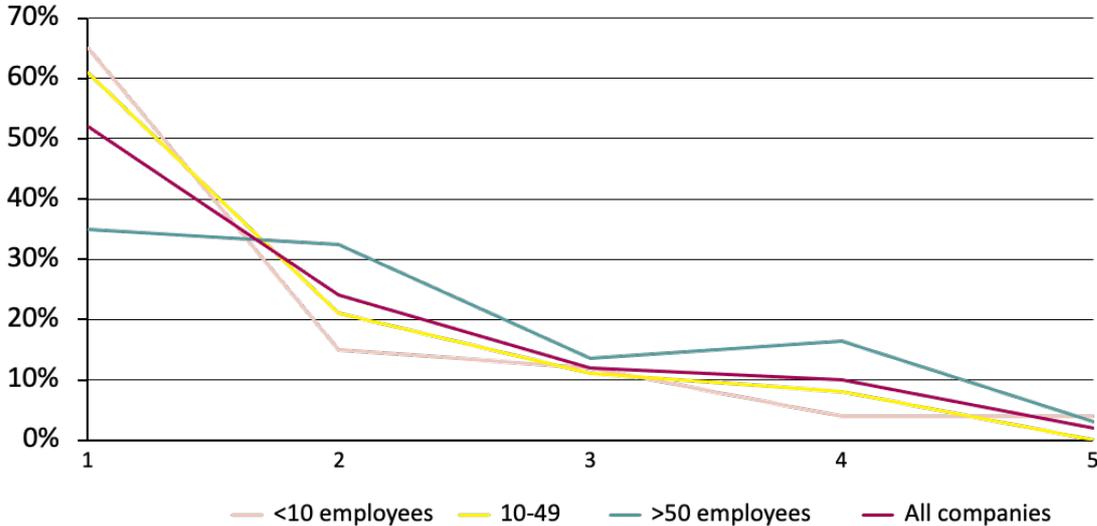


Figure 12. Knowledge of the possibilities of blockchain, grouped by company size¹⁶

¹⁵ Q10. Rate the following from 1 (strongly disagree) to 5 (strongly agree): I know the possibilities for the use of blockchain in my company.

¹⁶ Q10. Rate the following from 1 (strongly disagree) to 5 (strongly agree): I know the possibilities for the use of blockchain in my company + Q17. How many employees are you in the company?

We also asked respondents to what extent they think blockchain technology can make the supply chain in their industry more transparent, traceable, and sustainable. The results are shown in Figure 13.

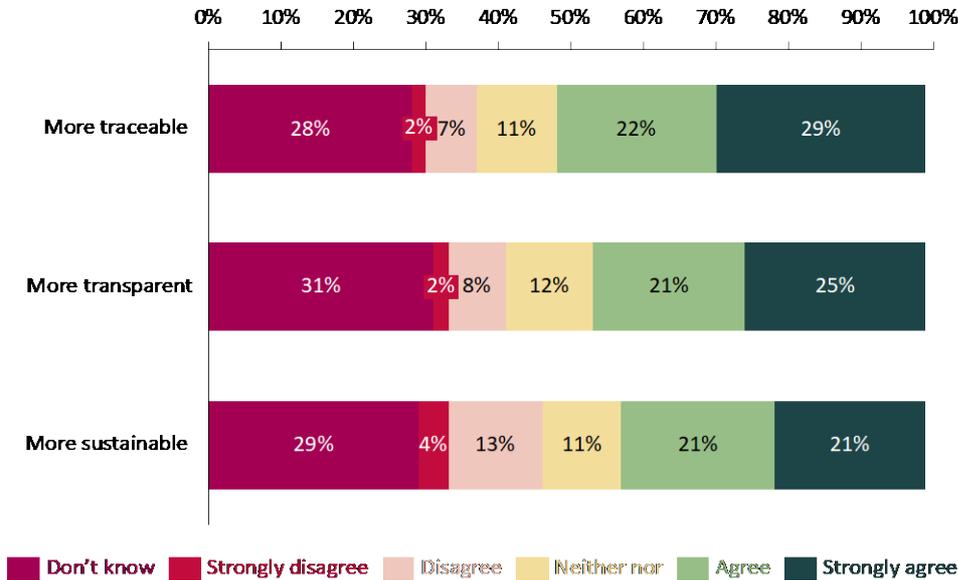


Figure 13. Potential of blockchain to improve transparency, traceability, and sustainability in the supply chain¹⁷

The results show that approximately 30% of the respondents claim not to know whether blockchain technology can help the supply chain of their companies' industry to be more transparent (31%), traceable (28%), and sustainable (29%).

Around half of the respondents agree or strongly agree that blockchain technology can bring transparency, traceability, and sustainability to the supply chains of their companies' industry. Differently from the degrees of relevance attributed to the three dimensions of transparency, traceability, and sustainability – where sustainability was attributed the most relevance in the supply chain – when considering the possible impact of blockchain technology, respondents make little difference between the three dimensions. Blockchain technology is considered capable to improve traceability only to a slightly higher extent than transparency and sustainability.

3.5 Blockchain adoption plans and adoption levels

In order to understand the concrete propensity to adopt blockchain technology in the supply chain that companies in the design industry have, and to understand what is the stage they are

¹⁷ Q11. Rate the following from 1 (strongly disagree) to 5 (strongly agree): Blockchain technology can make the supply chain in my industry more transparent, traceable, or sustainable.

in the adoption, we asked several questions regarding whether they have already used blockchain in the supply chain, and whether and when they have a plan to use blockchain in the supply chain.

The results show that Danish design and trade companies are still at the very early beginning of blockchain adoption (see Figure 14 and Figure 15).

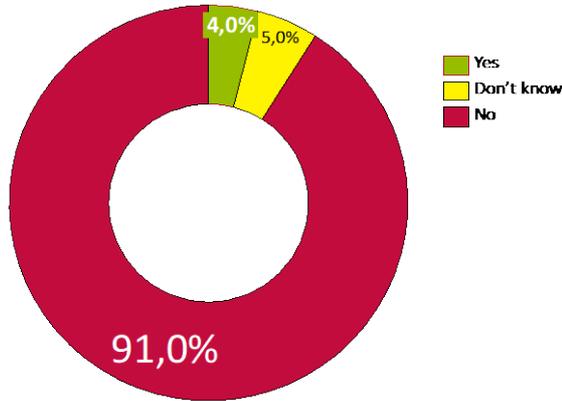
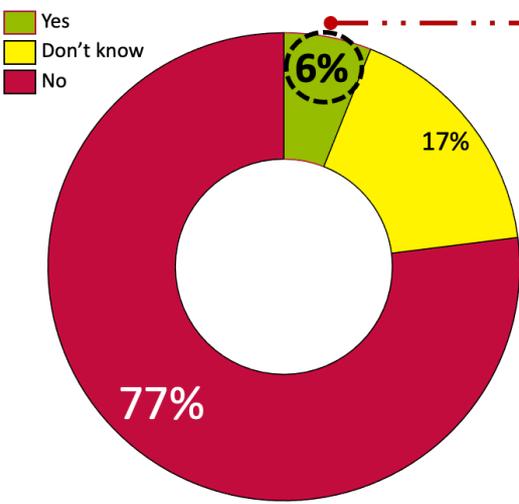


Figure 14. Use of blockchain in the supply chain¹⁸

Does your company have a concrete plan to utilize blockchain?



When will your company start to use blockchain?

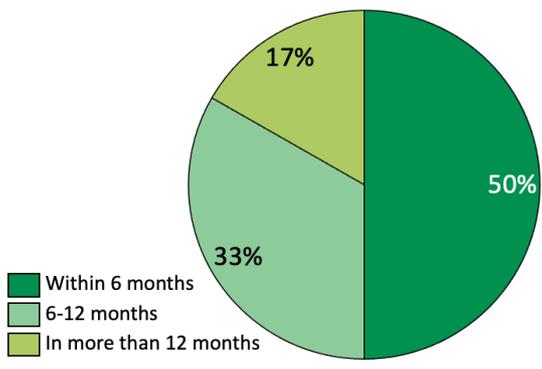


Figure 15. Prospects of blockchain adoption in the supply chain¹⁹

Only 4% of the companies claim to have started to use blockchain in their supply chain, and only 6% of the companies claim to have a concrete plan to adopt blockchain in their supply

¹⁸ Q12. Has your company used blockchain in the supply chain?

¹⁹ Q13. Does your company have a concrete plan to utilize blockchain?

Q13.1. When will your company start to use blockchain?

chain. Among the six companies who prepare to adopt blockchain in their supply chain, three of them plan to introduce blockchain technology within six months, two of them plan to introduce blockchain within 12 months, and one plans to introduce blockchain in more than 12 months.

Companies that have a plan to adopt blockchain tend to display a slightly higher willingness to share data for sustainability purposes, as illustrated in Figure 16.

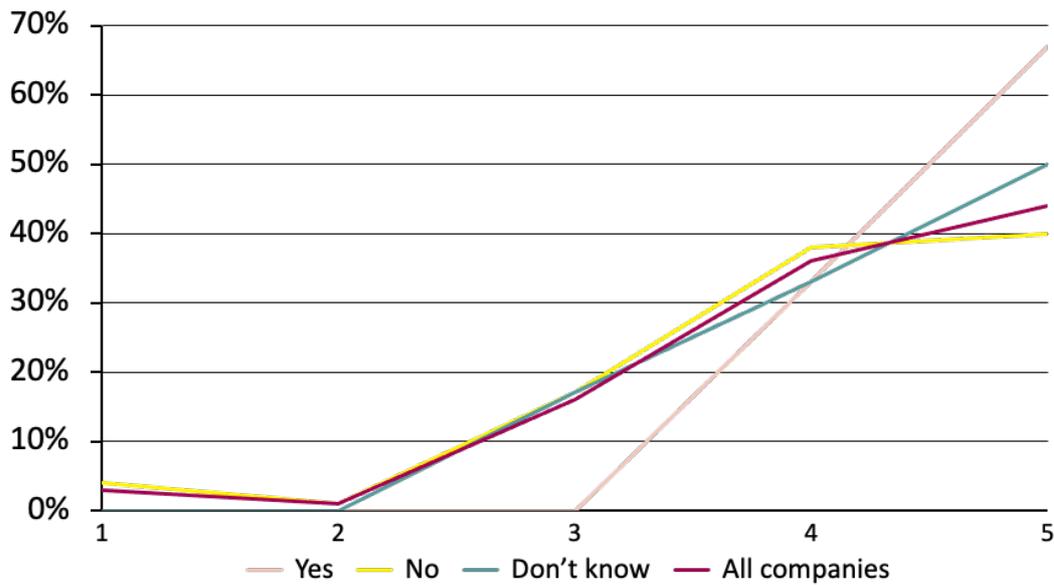


Figure 16. Willingness to share data for sustainability purposes, grouped by presence of a plan to adopt blockchain²⁰

²⁰ Q3.1 Rate the following from 1 (not at all) to 5 (to a very large extent): To what extent would you be willing to share data to have more sustainability? + Q13. Does your company have a concrete plan to utilize blockchain?