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Interviewee 1

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 1: In general, I would find my definition of centralization related more and more less the way traditional supply chains or Fin-Tech operations work. So you have, uh there's an intermediary there, and a broker and the actions of actors are stakeholders on that it's trusted entity. So there's a centralized trusted entity. So bit like the banking institution here in Ireland, you know, AIB or Bank of Ireland, we trust them on what is given into the bank. We trust them with essentized authority, to mediate broker and various functions within it within the financial industry. For us, that would be my kind of idea of idea of centralization.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 1: If you look at the new Facebook, the Facebook, to Libra white paper, like, that is so centralized, I see these top organizations, a pool of top consortium organizations. And if you're talking issues of centralization of governance, that for me is the total prime example of a private permissioned blockchain. And which is in line with your idea of mining these pools of mining, which is, you know, they do consortium behind is that is totally centralized or private, or whatever you want to call it.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 1: So architecture for me is there's no centralized authority, then you have your stakeholders and in the blockchain world, there is no centralized authority There is an idea of a pool or a network. That's in operation. But my idea of a blockchain is dash, I often equivalent equivalent to like it dissolves definition to what blockchain is, for me, it's a decentralized digital ledger, a database, that's a network of actors, and have rights governance, they have decision rights over how the network will operate. No one central authority has control over the way that network operates.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is lay-

ered approach better than traditional block representation, if yes why? If no, explain)

interviewee 1: I do like the diagram. And when I started looking at cloud computing, I looked at the NIST definition. So, you had software as a service at the top infrastructure. And then you had the way that those could be operationalize of public cloud, private cloud, hybrid cloud community cloud. And then those these core technology, characteristics of the technology, so rapidly elasticity pooling, and so on.

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 1: The only factors I would think that would be needed is number one, just heard it for what context is this? Is it like applicable to all scenarios? All blockchains? Like, as I said, telcos cryptocurrencies storage, machine learning algorithms. And the other thing is, well, I would like to see is what makes as in if this is a reference model, just to show what makes the blockchain different perhaps, to the traditional to like, I like this. What I'd like to see like as the go to model like the cloud computing model what are, what makes that like you mentioned the consensus, if there was something under like, if this similar to a traditional system here, just outline what's different.

Interviewer: Can you rate the significance of all identified factors?

interviewee 1: Please see Table 1 for the response.

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 1: Gini seems like a good choice.

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 1: No, I think I think a single score is justified, but, are really important you weight these I think it's perfect. It makes sense to me and it's something I wouldn't have seen there before.

Interviewee 2

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

Table 1: Signification of Centralization Causing Factors for I1

Layer	Centralization Factor	Significance
Application Layer	Wallet Concentration	Insignificant
	Exchange Concentration	Significant
	Reference Client Concentration	Insignificant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Insignificant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Significant
	Geographic Distribution	Significant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Significant
	Improvement Protocol	Significant

interviewee 2: Well, centralization is having very limited number or in one location. A technology I mean, in the case of blockchain, it would be, you know, having one set company owning all the servers, you know, regardless of where they're distributed geographically, it's just kind of the property ownership.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 2: The leading causes I suppose, for us, the biggest one is throughput, not just the speed of transactions, when it's centralized, you can make it faster. So, you know, even like private blockchains, you know, obviously being the ultimate of centralized but is the fastest.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 2: N/A

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 2: Yeah, absolutely.

Table 2: Signification of Centralization Causing Factors for I2

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Insignificant
	Exchange Concentration	Insignificant
	Reference Client Concentration	Significant
Operational Layer	Storage Constraint	Significant
	Specialized Equipment Concentration	Insignificant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Significant
	Geographic Distribution	Significant
	Bandwidth Concentration	Significant
	Routing Centralization	Significant
Governance Layer	Owner Control	Insignificant
	Improvement Protocol	Significant

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 2: No, I would point that the applications tend to impact storage.

Interviewer: Can you rate the significance of all identified factors?

interviewee 2: Please see Table 3 for the response.

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 2: I am happy with the techniques.

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 2: I would prefer aspect specific definition and measurements rather than a single measurement or definition.

Interviewee 3

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 3: So it's essentially talking about central databases are providng software as a service provided. So like the classic model, we'll

be thinking of the the Googles, apples are from what they're doing in the cloud. So that is very much a central centralized system if you like. So if you use any of the applications and associated with, say, Google, so Google Docs or Google Drive or Gmail, are any of their services, then you're going back to one central database. So one central system. So there's a central authority who control .

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 3: You need a certain amount of technical knowledge. In fact, to to do anything and in Bitcoin or a theorem, you need a certain amount of technical knowledge. Okay, even if you think about getting a wallet or getting a hardware, wallet, or even understanding the software wallets, to how to protect yourself, you need a certain amount of technical savvy to be able to do that. So I think that it's not for everyday users, if you like. And in terms of, you see, there are a lot of services now that you can use to to act as an intermediary for you. Like I'm thinking of, like Coinbase, though, so I think that certainly some people are using those centralized services if you're going to act to access cryptocurrencies, so it's really a barrier.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 3: N/A

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 3: I suppose it does.

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 3: N/A

Interviewer: Can you rate the significance of all identified factors?

interviewee 3: Please see Table ?? for the response.

Table 3: Signification of Centralization Causing Factors for I3

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Insignificant
	Exchange Concentration	Significant
	Reference Client Concentration	Insignificant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Insignificant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Significant
	Geographic Distribution	Significant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Insignificant
	Improvement Protocol	Significant

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 3: I am happy with the techniques.

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 3: A generic definition makes more sense to, I would say business our business users or managers.

Interviewee 4

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 4: Since I'm from Business School centralization for me this is to share information among participants who trust each other for participants to choose to trust some central third party. So for me, centralization refers to that trusted party in the system. And decentralization would be opposite of it. You don't need a trusted centralized party.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 4: The leading causes of centralization, so mining pools definitely mining pools are often considered centralized. If you want to make any profit in Bitcoin or Ethereum or any other cryptocurrency you'd have to join a mining pool and then mine with them so I think mining pool is a major contributor apart from mining pool. Yeah, I think mining pools most.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 4: It's a distributed system. It's a peer to peer system. So you have your network, peer to peer network and you have some consensus mechanism mechanism that gets people to agree on a single on the data. So I think these are two main components of the blockchain.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 4: it seems like a good good architecture for blockchain.

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 4: N/A

Interviewer: Can you rate the significance of all identified factors?

interviewee 4: Please see Table 4 for the response.

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 4: N/A

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 4: I would prefer multiple values single value, it seems like it seems more clear, since we're looking at individual factors, I would prefer multiple values rather than single.

Table 4: Signification of Centralization Causing Factors for I4

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Significant
	Exchange Concentration	Significant
	Reference Client Concentration	Insignificant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Significant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Insignificant
	Geographic Distribution	Significant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Significant
	Improvement Protocol	Significant

Interviewee 5

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 5: There are different aspects of centralization based on aspects such as transaction validation, transaction approval (consensus), order management, identity management and node management. Different blockchains can fully centralized, partially centralized or completely decentralized in the above aspects. It is important, for example encryption key management by exchnages inorder to preserve privacy of data before goes into the blockchain.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 5: Geographical concentration of cheap electricity in PoW, Inequality in wealth distribution in PoS, laziness to run full nodes, inability to run full nodes.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 5: The blockchain is an immutable database sequence called blocks, the data structure block is an important part of the architecture. They can actually contain transactions, files, or other

Table 5: Signification of Centralization Causing Factors for I5

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Significant
	Exchange Concentration	Significant
	Reference Client Concentration	Significant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Significant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Significant
	Geographic Distribution	Significant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Significant
	Improvement Protocol	Significant

data you want. However, the main thing is that they're connected by hashes. It's also a distributed network, and that's another essential aspect.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 5: Yes

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 5: I guess side chains are something you might have missed.

Interviewer: Can you rate the significance of all identified factors?

interviewee 5: Please see Table 5 for the response.

Interviewer: Can you suggest measurement techniques for these identified factors?

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 5: I am happy with the techniques.

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 5: I'm an engineer, so I prefer to precision you know, so a multidimensional model but I know when you're presenting to business people, a single score might be what they're looking for.

Interviewee 6

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 6: So basically, there is no central, authoritative person or group or anything to make decisions or plans in a decentralized system.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 6: Clearly not being able to run full nodes on consumer hardware is a major issue for me. I also fear that in a geographically focused network, people within the same geographic location will have an edge over others, they will receive and spread transactions first.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 6: As for myself, I would like to split it into two key levels of the blockchain network. In contexts of the blockchain system (software and hardware) as a whole, it is focused on a distributed computer network and has a consensus algorithm (POW, POS) to ensure that each node in the system can achieve consistency. It is governed by a group of people.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 6: I think you should include a governance layer in the architecture.

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 6: Governance layer is something you need to include.

Table 6: Signification of Centralization Causing Factors for I6

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Insignificant
	Exchange Concentration	Insignificant
	Reference Client Concentration	Insignificant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Insignificant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Insignificant
	Geographic Distribution	Significant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Insignificant
	Improvement Protocol	Insignificant

Interviewer: Can you rate the significance of all identified factors?

interviewee 6: Please see Table 6 for the response.

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 6: Gini seems like a good choice to measure centralization in wealth and mining. The measurement technique for geographic mapping seems inadequate as the directionality seems vague.

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 6: The key drawback in a common concept of decentralization is that it incorporates different forms of decentralization, but in differing degrees, and not necessarily equivalent. A single decentralization attribute is inaccurate as a valid indicator of comparative decentralization.

Interviewee 7

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 7: In general, I follow the money. If the trail of funds leads to one natural person or group of natural persons (regardless of

number of addresses), then the process is relatively centralized along the spectrum of centralized-decentralized blockchain.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 7: Incentivization. That's really what Bitcoin was originally about, right? Incentivized disintermediation to lower the cost of transacting? I suppose that fixed supply is arguably a leading cause within the system, but blockchain doesn't live in a vacuum, so really it was/is the externalities (ASICs and other special hardware for example) that threw the biggest wrench in the experiment.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 7: To start with, think of blockchain as a decentralized database of peer-to-peer networks. Very much like NoSQL, perhaps. Much like we have a lot of NoSQL databases; we have a lot of blockchains.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 7: I think it does.

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 7: N/A

Interviewer: Can you rate the significance of all identified factors?

interviewee 7: Please see Table 7 for the response.

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 7: I personally think wealth concentration should be measured by centrality of nodes in the graph of bitcoin transactions , we have been trying to do this for a long time and we've had some success at locating different exchanges in the graph.

Table 7: Signification of Centralization Causing Factors for I7

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Significant
	Exchange Concentration	Significant
	Reference Client Concentration	Insignificant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Significant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Insignificant
	Geographic Distribution	Significant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Significant
	Improvement Protocol	Significant

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 7: I'd prefer multiple scores to a single one.

Interviewee 8

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 8: Decentralization to me corresponds to a leaderless structure in which all stakeholders have equal rights and responsibilities. In this peer to peer network, there is no single point of failure and participants can join and leave the network without risking interruption or degradation of the network

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 8: If you remember the catastrophe that centralized implementations such as Mt. Gox, Bitfinex have brought to the blockchain world, you can clearly see the desperate need for decentralization in user facing applications.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

Table 8: Signification of Centralization Causing Factors for I8

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Significant
	Exchange Concentration	Significant
	Reference Client Concentration	Significant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Significant
Incentive Layer	Wealth Concentration	Insignificant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Insignificant
	Geographic Distribution	Insignificant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Significant
	Improvement Protocol	Insignificant

interviewee 8: In simple terms blockchain is essentially a database spread out over internet. This database stores transactions securely by using cryptography.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 8: This looks good but where are exchanges in this?

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 8: Exchanges.

Interviewer: Can you rate the significance of all identified factors?

interviewee 8: Please see Table 8 for the response.

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 8: It probably isn't ideal but maybe you could also look at price formation in the exchanges.

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 8: A single score can make it easy for non-experts to understand how good or bad a blockchain is but that means people will think of decentralization as true or blue which is not true.

Interviewee 9

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 9: Decentralization is a condition that does not rely on centralized actors or organizations but allows for a specific centralization level. This does not require any unified authority to do so.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 9: The easiest way for me to spot centralization is to look at who owns the cryptocurrency. If the majority of the supply belongs to a developer or company behind the development, I consider it is centralized.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 9: A blockchain is simply just a database, or a ledger, of recorded events one which is "distributed" or circulated by several independent parties. This can only be modified by consensus of the bulk of system members. And once reached, the data could never be deleted. Main components would be distributed system, consensus, the data structure and immutability.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 9: It does, it is more explanatory than a block representation.

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 9: How do you detect who owns the cryptocurrency?

Interviewer: Can you rate the significance of all identified factors?

interviewee 9: Please see Table 9 for the response.

Table 9: Signification of Centralization Causing Factors for I9

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Insignificant
	Exchange Concentration	Insignificant
	Reference Client Concentration	Significant
Operational Layer	Storage Constraint	Insignificant
	Specialized Equipment Concentration	Significant
Incentive Layer	Wealth Concentration	Significant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Insignificant
	Geographic Distribution	Insignificant
	Bandwidth Concentration	Insignificant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Significant
	Improvement Protocol	Insignificant

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 9: The fractional calculation of the owner control would vary with the supply; a simpler approach might be to use a metric that looks at how much power over the network can be achieved with the money in the owner control. How much hardware can you afford, and what hash power can you get with it. Relating the cryptocurrency to the hashing power would be more informative

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 9: A simple easy-to-understand score is perfect, because anyone who doesn't understand how blockchain functions can nevertheless understand how valid the decentralization arguments are.

Interviewee 10

Interviewer: How do you define Centralization? (Prompt: in a blockchain context, Importance, Proof-of-work vs. Proof-of-stake)

interviewee 10: Decentralization in the broader sense means that no single party has sole power of data or processes.

Interviewer: What do you think are the leading causes of centralization in Blockchain? (Prompt: Can you suggest how these are measured?)

interviewee 10: Personally, I've just experienced the first challenge because my Linux partition ran out of capacity; however, if I bought additional harddisks, I will still be able to run a full node, but it is getting more expensive to run full nodes.

Interviewer: What components do you think best describes the design of a blockchain? (Prompt: what components, why and how significant)

interviewee 10: Bitcoin depends on TCP, which pretty much ensures that we can use the ISO / OSI stack to adequately describe the structure. I actually think the seven-layer framework can help explain how blockchain operates.

Interviewer: Do you believe the layered architecture used by our study captures vital design components of blockchain? (Prompt: Is layered approach better than traditional block representation, if yes why? If no, explain)

interviewee 10: It does.

Interviewer: Can you identify any component that we have failed to capture in the layered architecture? (Prompt: if yes, what and where do you suggest it fits in the architecture)

interviewee 10: N/A

Interviewer: Can you rate the significance of all identified factors?

interviewee 10: Please see Table 10 for the response.

Interviewer: Based on the factors identified by our research group, we have produced a list of measurement techniques for each element. Can you identify any flaws in the method used for the measurement? (Prompt: If yes, suggest alternative)

interviewee 10: Nothing really stops blockchains from becoming so large that we will run out of capacity considering that Moore's Law applies hard drives. It will interesting to measure the growth rate in comparison with Moore's law.

Interviewer: Would you prefer a multidimensional models to describe decentralization or a generic definition of decentralization?

interviewee 10: I like would prefer a single score so that I can compare it with other blockchains without having to understand how each blockchain works.

Table 10: Signification of Centralization Causing Factors for I10

Layer	Centralization Factor	Signification
Application Layer	Wallet Concentration	Insignificant
	Exchange Concentration	Insignificant
	Reference Client Concentration	Significant
Operational Layer	Storage Constraint	Significant
	Specialized Equipment Concentration	Significant
Incentive Layer	Wealth Concentration	Insignificant
Consensus Layer	Consensus Power Distribution	Significant
Network Layer	Node Discovery Protocol Control	Significant
	Geographic Distribution	Insignificant
	Bandwidth Concentration	Significant
	Routing Centralization	Insignificant
Governance Layer	Owner Control	Insignificant
	Improvement Protocol	Insignificant