NGI101x - Socio Complexity part II

Welcome Back! Last time we talked about Unbundling, Competition, Privatization and Trans-national networks. What do all of these transitions mean for the complexity of infrasystems?

In the video on complexity you saw that complex behaviour arises from interaction and thus that complexity theory focuses on relationships.

All of the changes mentioned have made the network of actors far more complex. There are now many more actors, with a greater diversity in backgrounds, and in interests.

But to truly understand the complexity of a system, we must focus on the relationships between actors and the interactions between them. And these interactions are indeed extremely complex.

What happens in these relationships, and what types of interaction take place? Many different types. All actors undertake actions.

Actions that influence other actors, who in turn take anticipatory and reactive actions themselves.

Let us start with the public organizations concerned. What do they do? As well as making laws, ministries do far more: they issue policy documents, draw up subsidy rules, change the conditions and withdraw them again, top officials and administrators give speeches, etc. Administrators and civil servants speak to industry and consumer representatives and send out certain signals in these conversations, which can be significant for those involved.

Regulators are also active, for example setting rates and approving or rejecting investment plans.

Companies put new products and services on the market, tap into new markets, decide to discontinue certain products and markets. etc. Companies adopt an aggressive approach towards some competitors, while entering into joint ventures with others. Companies move upstream or downstream in the value chain. Companies tap into new markets or withdraw to their home market, etc.

All in all this is only a very limited selection of activities, yet even this selection is enough to show the abundance of actions that take place in such an infrasystem. While this is already a large amount and complex, there is more. Some of these actions are relatively straightforward. It is clear what the actor intends with his action and what the action entails. But for some of the actions this isn't very clear at all. These are the actions with a hidden agenda. For example, a company can put a new product on the market, which at first sight meets the needs of a group of customers. But, let's say this purchase virtually forces the consumer to continue to buy products from the same company in the future, without the customer being fully aware of this. That would be a hidden agenda, and not everyone

considers this fair play. This could be strategic behaviour. Companies exhibit all kinds of strategic behaviour.

However, government bodies are no stranger to this either. A law, for example, may appear sound, with a clear and respected objective. But the law can also be based on a hidden agenda.

One example of a possible hidden agenda of a law in the world of infrasystems is: 'the protection of national industry'. Another example is: a government body that has already issued a subsidy scheme may be shocked by the unexpectedly high interest in the scheme, and therefore decide to discontinue it. But that same government body is aware that announcing the discontinuation of the scheme can lead to a run on it. So it is very possible that the government creates the impression that the scheme will continue to exist whereas it is unexpectedly discontinued overnight for the outside world.

End users also play this game.

They decide to make or delay a purchase. They may stop buying a brand they have been loyal to for years, or they may decide to stay with their trusted brand. They state that they prefer more sustainable products but don't always practice what they preach.

In short, the number of actions of actors in an infrasystem is incalculable, and many of them are of a strategic nature. These actions are significant for other actors in the network, who either benefit from or are hindered by them. Because these actions are significant for them, they will respond to them or perhaps even anticipate them. And this happens with regard to a multitude of actions throughout the network. The result is a complex ongoing tangle of decisions. But how exactly does this dynamic occur?

Let's say that an actor is preparing a decision.

He knows which options are available to him. In considering which alternative to choose, he will try to imagine how other actors will respond to his alternatives. If a company puts a certain product on the market for a certain price, which of the consumers will purchase it, and how will the regulator respond? And what about the competitors?

Ultimately, he will make a decision and act. Some of the results of the decision, including the actions of other actors, will be as expected, while others will be unexpected. The reason for this is that the reactions of actors and systems could not be entirely predicted in advance and because not everyone provided the correct data. Many actors will work on such considerations at the same time, and all of them will be confronted with some unexpected, unfavorable effects. Although for some this is no reason to change their decision and course, for others it is. They will reverse their previous decision and make a different one. This means that other parties will be confronted with the negative effects, which will in turn prompt them to make another decision. And yet other actors will respond to and anticipate

that. The dynamic can no longer be stopped. Nobody can see the whole picture any longer, never mind respond to it effectively.

The interference of all these decisions is unpredictable. It is impossible to anticipate what the outcomes of all of these decisions will be. Clearly, the more actors there are, the more complex the interactions become. This shows the complex system on the social side of infrasystems.

The technical side of infrasystems is already complex, as we have already seen. The social side now turns out to be complex itself. So, it goes without saying that the combination of the technical and social side of infrasystems is also complex.

Thank you for your attention!