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The Curse of Complex Systems

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Sarah Lamaison, co-founder and CEO of Dioxycle, observes that some founders lose faith because they know their technology is possible but don't know why it's failing in the lab. She advises those founders to remember that the more components you have, the more incremental optimization it takes for the whole series to work.

Transcript

Sarah So you've passed all this.. 00:00:06,993 You still think it's gonna work, and there's a final trap, which is, you know, it can work, it's fundamentally sound, et cetera, but now you lose face because you're tired.. You're really tired.. You know, it's possible, but nothing is working in the lab and you don't know why.. Yeah, and so there's a.... I mean, a friend of mine, entrepreneur Sebastien Boyer, gave me a good image to think about that, which is like, the curse of complex systems.. So, you know, you have to imagine your system when you're working on a complex technology as a sort of series of components, and they're all in series, and as you know from your electricity courses, when one thing is not working, then the series line is not working.. And so here on this graph, you basically represent the probability of a system comprising N components of working based on the probability of one component working.. And so you see that, when you have one component and equal one, it's very easy.. I mean, it's linear, of course..

But then, as you increase the number of components, there are more and more probability that the series of components won't work at a given probability of one component working.. And so you end up, when you have a lot of components, you end up having a very long portion, I mean, a very long time where your system is not working, although you're incrementally optimizing each of your components.. And you have to really reach a threshold where above that threshold, above that probability of working of one component, the series starts working.. I mean, that's a very important thing, and we had that a lot also at the beginning.. I mean, we still have systems that don't work, and you know, you test one hypothesis.. You think the result is negative, but it's actually kind of a false negative because there's still something else that is not working, and yeah.. Yeah, that's really hard, and the answer to that is to keep pushing.. And actually, there's a second part to that quote of Phil Knight when it says, "Sometimes you have to give up, Sometimes knowing when to give up, when to try something else, is genius," which is, "Giving up doesn't mean stopping.. Don't ever stop." And that's the answer to the last trap...