

## Part 2 : Life and death of a smartphone

**Guillaume** : So Théo, how do you respond to a customer who wants to have their cake, eat it and have a second slice too?

*Théo* : I'd play it by ear.

**Guillaume** : That's what I thought. You know what, let's do a little role play.

*Théo* : Okay.

**Guillaume** : Hello, sir. I'd really like a really slim, powerful smartphone. Does that exist?

*Théo* : Yes, it does.

**Guillaume** : Since I swim a lot, it would need to be waterproof too.

*Théo* : That exists as well.

**Guillaume** : And unbreakable. I'm quite clumsy.

*Théo* : That's also possible.

**Guillaume** : And environmentally friendly.

*Théo* : That we can do. Anything else?

**Guillaume** : Not too pricey either.

*Théo* : Yes, we could do that.

**Guillaume** : No, you should say, "Hold on."

*Théo* : Why?

**Guillaume** : Because, as Oscar Wilde would say : «Nowadays, people know the cost of everything and the value of nothing.». A phone is like jewellery. It's precious.

*Théo* : It's not exactly gold either.

**Guillaume** : Yes, it is, and silver. Several milligrams in fact. Phones should be sold in jewellery shops and displayed on a pillar in a case, under a cloche even. Know what phones are made of?

*Théo* : No.

**Guillaume** : Let me explain.

*Théo* : Hmm.

**Guillaume** : 4.5 million years ago, Earth was a molten mass.

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*Théo* : This could take us a while.

Hotline : It's not such a bad idea to start with Earth, when you're talking about what's inside our phones, because the two are connected. Let's look at what our little technological jewels are made of: The outer case is generally made from plastic, so refined oil, a glass screen that also contains indium amongst other things, which is a rare metal that is running out, a lithium-ion battery which lasts a long time and is really small, but full of toxic components, and a circuit board which in some ways is the brain of the phone, and electronic components connected via extremely fine contacts. This circuit board brings the valuable materials together. There are basic, special metals and precious metals as well as rare-earth elements.

*Théo* : What are rare-earth elements?

**Guillaume** : Rare-earth elements aren't necessarily extremely rare, they're just very difficult to extract. In order to make just a tiny part, you need to move tons and tons of earth to extract these metals, okay? In a smartphone, there are more than 50 different metals: Ores that are sometimes millions of years old, fossil resources that you need to look for in the depths of Earth in mines, with your hands in the mud.

Hotline : The ores are mainly extracted in mines in Africa or Asia. And extracting them is laborious. It requires large spaces, large quantities of water and energy, and it can have dramatic consequences for the areas they're extracted in. Mine pollution, water pollution, soil erosion, loss of biodiversity. To extract rare-earth elements, extremely harmful chemical products are injected into the soil. The water gets polluted by the radioactive substances released. Residents of the surrounding areas get sick and their crops dry up. In some countries, fatal accidents among miners are frequent and sometimes minerals are difficult to access so children are sent in because they're smaller and more flexible. There is such a high demand for these metals, that we weren't even considering the awful conflicts it could provoke a few years ago. The Democratic Republic of the Congo is home to almost all global coltan reserves, an ore from which we extract tantalum, found in our phone capacitors. And this godsend is what helps warlords fund weapons. It seems very foreign to us, but we're not exempt from responsibility.

*Théo* : That's messed up.

**Guillaume** : You can say that again. Tantalum, for example, is nicknamed a "blood mineral", just like blood diamonds. You see, we're back in the jewellery shop.

*Théo* : All that for a few milligrams? That's not even enough to make a ring out of it.

**Guillaume** : No, but multiplied by billions, it all adds up in the end. The fundamental thing we tend to forget is that these minerals are finite resources that aren't renewable. They'll eventually run out. You need to go to further extremes to find them and extracting them becomes even more expensive and complex. Indium, for example, which is in screens, might run out in 15 years. Bye.

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*Théo* : Yeah, but in 15 years we'll just find it on Mars.

**Guillaume** : Yeah, right. We'll see. In the meantime, we're talking about digging up the ocean floor and polluting it even more. Don't you think we should question our excessive consumption? Because most of the time, after about two years these jewels end up in the bin.

*Théo* : I know, it's worrying. We should tell customers to send their old phones back to the operators.

**Guillaume** : They should be returned to landfills or collection points so they can be recycled. A phone in the bin is just a time bomb.

Hotline : Phones make up part of what we call WEEE, Waste from Electrical and Electronic Equipment. They contain extremely pollutant gases and materials. Some of them like lead, bromine, chlorine, mercury and cadmium are basically poison, and I'm not even talking about the lithium-ion battery, which is what classes phones as hazardous waste.

So, it's important to recycle old phones as much as possible. In controlled sectors, we dismantle the equipment by hand. The components are so fine and the metals are in such small quantities that it makes this work extremely complicated and it's really difficult to collect the raw materials to recycle them. The collection rates are weak, too weak to be able to make a new phone from 5, 10 or even 1,000 old phones.

In the meantime, the vast majority of WEEE isn't in the appropriate sectors and is found in nature. Mafia-like organisations send them to poor countries out of sight. There, workers, some of whom are children, break up the electronic material without protection to collect the precious metals, then they throw out or burn the unsellable parts. This is catastrophic for both the environment and for people.

**Guillaume** : It's best to keep your phone for as long as possible.

*Théo* : And to think I've thrown away my phone because I dropped it down the toilet.

**Guillaume** : Are you crazy? If your phone is submerged in water, don't try to turn it back on again. Put it in a bowl of rice for 24 hours and most of the time that's enough to get it working again. As a general rule, it's better to fix it than to throw it away. Would you throw jewellery out?

*Théo* : Relax, it happened one time. I actually have a box full of WEEE in my basement.

**Guillaume** : Anything is better than throwing it out. It's a lesser evil because we'll hopefully be recycling better 10 years from now. The best way is to take care of your phone and not change it every other day. So, what would you say to your customer who wants everything there and then at a cheap price?

*Théo* : Sir, please remember that 4.5 billion years ago, Earth was just a molten mass...