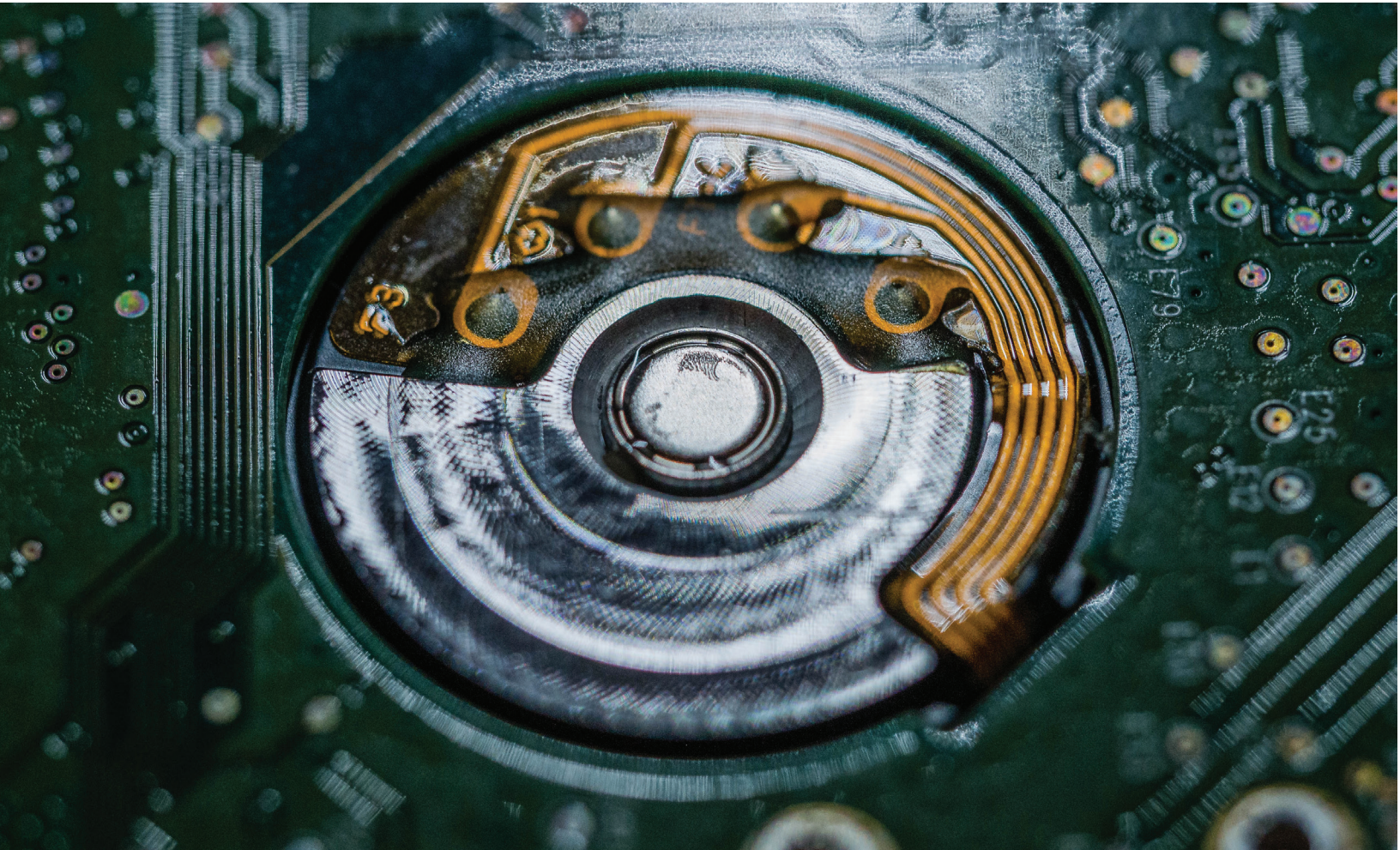# Tuning in to value: How Sky redesigned its set-top box for the circular economy

An executive explains how the pay-TV company saved money and pleased customers by designing hardware for repair and reuse.

Eric Hannon and Sebastian Hauptmann

When pay-TV broadcaster Sky Deutschland set out four years ago to develop a new set-top box, which processes a satellite, cable, or internet video stream and feeds it to a viewer's TV, its foremost goals were to provide customers with cutting-edge capabilities and to achieve improvements in operational efficiency and environmental performance. Those goals led the company to engineer the new device, known as Sky+ Pro, for durability, reuse, and easy upgrades with a circular design—an approach that reflects the idea of the circular economy. It complemented those qualities with a sleek, user-friendly look that won a Red Dot Award for product design and several other awards. Sebastian Hauptmann, Sky Deutschland's executive vice president of operations, spoke with McKinsey's Eric Hannon about the company's efforts to integrate circular-economy ideas with a great customer experience.

McKinsey: *What was your approach to designing earlier generations of set-top boxes?*

Sebastian Hauptmann: The last time we launched a new set-top box was after Premiere, our predecessor company, was rebranded Sky Deutschland in 2009. Our priority was to add features like digital video recording and on-demand viewing of recent programs. We also wanted the boxes to reinforce the company's new identity. All this had to be accomplished quickly. To save time, we reused hardware and middleware from other Sky divisions and adapted their features for our German market. Since the box met our specifications, worked well, and looked good at the time, it was the right approach.

McKinsey: *What made you reconsider that approach to creating set-top boxes?*

Sebastian Hauptmann: After I joined the company in 2010, we initiated a drive for cost savings and operational efficiency that looked at everything from design to sourcing. Since the company owned the set-top boxes and leased them to customers, we saw an opportunity to make the box less expensive across the life cycle. The OEM paid for repairs as long as the boxes were under warranty. But as more boxes outlasted their warranties, we spent a lot on refurbishment, repairs, returns, and shipping.

We also wanted to improve the customer experience. The typical set-top box lasted seven years or more, which is long for consumer electronics. In that time, a customer's needs for TV service might change, or the customer might move from a satellite household to a cable household or vice versa. The box can stop working if a component fails, or the box's specifications can fall behind the requirements of our service. When something goes wrong with the box, the customer has to send it back, which interrupts his or her viewing. We felt we could manage the boxes in a better way for customers.

McKinsey: *How did you start to address these issues?*

Sebastian Hauptmann: We began by looking for ways to lower costs in the return process. A simple but valuable change was having the repair-service company recover used accessories, like remote controls, cables, and power-supply units, and refurbish them to be used again. When a customer sent back a set-top box with a problem, we could swap the faulty component for a refurbished one.

Next, we started collecting more information about the problems with returned boxes. Our previous repair-service providers examined set-top boxes returned as faulty only to diagnose failures. When we consolidated and switched to a new repair-service provider in 2012, we asked the company to follow an automated screening process that would pick up every problem for every box—not just obvious causes of failure but also issues that are intermittent or less apparent.

McKinsey: *What did you learn from all that information?*

Sebastian Hauptmann: It helped us understand the box's total cost of ownership, from supplying boxes through supporting them over their lifetimes, including service, repairs, and returns. We could see which parts of the box added the most to its total cost of ownership. For example, we found we could lower the costs of repairs and give subscribers a better experience by switching to modular hard drives. Customers can disconnect the hard drive from the box when something goes wrong with one of them. If the box develops a problem, the customer can keep his or her hard drive with all his or her recorded programs. If the hard drive fails, the customer can send it back while keeping the set-top box so he or she can continue to receive live and on-demand TV service.

McKinsey: *Where did that discovery lead you?*

Sebastian Hauptmann: After we saw the benefits of decoupling the hard drive from the main unit, we reasoned that we could extend the same logic to the entire design. The easier we made it to fix or replace just the faulty parts of a box, the more we could save by keeping functional parts in service. And extending the life of the box would lower the total cost of ownership. That's when we started thinking of the set-top box as a circular product.

But the box hadn't necessarily been designed to last a long time. It was designed to be manufactured inexpensively. Some components were glued in or snapped together, which made them difficult to take apart. We knew we would have to rethink the design, with the aim of making the box modular, durable, easy to repair, and economical.

McKinsey: *How did you approach that effort?*

Sebastian Hauptmann: Sky's contract with the manufacturers of the last-generation box was ending. That gave us an opportunity to reset our

expectations for the OEM. When we wrote the tender [request for proposals] to manufacture the new box, we included requirements that would help us make the box more reusable and cost effective.

One provision required the OEM to collaborate with the repair-service company. We had switched a while ago to having OEMs rely on the repair company's diagnostic data rather than do their own inspections. The next step was to ensure that the OEM made full use of the repair company's insights in designing the box. We also wanted the repair-service company and the OEM to refine the repair-inspection process so the findings would be more useful to the OEM in the future.

Another requirement was for the OEM to work with us directly on designing a box with a lower cost of ownership. One of the companies that had made the last-generation box came up with an outstanding approach. It promised to set up an office less than one kilometer from our main office, so it could work closely with our product team. It also offered to send design and engineering experts to Germany to work with us several days each week throughout the three-month design process. This "one roof" approach—where specialists work together in the same place—accelerated the process and led to great outcomes.

McKinsey: *What design changes resulted from your work with the OEM?*

Sebastian Hauptmann: We changed the design in many ways, which can be sorted into two main categories. One is electrical design. We improved the quality of some components, like the smart-card reader and the electrolytic capacitors, so they would fail less often. We got rid of all the buttons except for a single reset button. We also reconfigured the components inside the case. For example, using Serial ATA [advanced technology attachment] connectors that are straight rather than angled

made them easier to repair. The biggest benefit of reorganizing the components was improving airflow enough that the box wouldn't need a fan.

Another set of changes had to do with the outer case. Driving and removing the screws in the case adds time to manufacturing and repairs. We got rid of screws by using a snap mechanism that was safe but easy to open with a special tool. We also switched to sturdier materials for parts that experience less wear and tear and inexpensive materials for parts that need to be replaced frequently. The top panel, in particular, gets scratched a lot. Sometimes customers put stickers on it. Now we make it out of low-cost plastic, and it's no trouble to snap on and off. We also use this modular top panel to offer branded receivers, such as a receiver in the colors of a customer's favorite football club—a nice way to use circular design to generate incremental revenues.

McKinsey: *Coming up with a circular design couldn't have been easy, even with a cooperative manufacturer. What challenges did you run into?*

Sebastian Hauptmann: It took some time to convince our colleagues that we should redesign the box. Once we decided to do that, we didn't have in-house experts in design or engineering to drive the process. We ended up hiring a design agency.

Furthermore, it was important to gather opinions from internal groups and get their support for the choices we were exploring. That helped build a sense of ownership for the box, which we needed when it came time to market and sell it. Finally, it was important to apply good judgment on trade-offs. For example, our marketing colleagues clearly preferred a polished Sky logo on top of the box, while a matte finish was preferable from a circular-design perspective. We found a great solution to that: making the logo polished but embossed on the top cover, so it rarely gets scratched.

McKinsey: *How have customers responded to these new set-top boxes?*

Sebastian Hauptmann: Customer satisfaction has gone up since we brought out the new set-top boxes, which is great. A key reason for this is that the integrated Wi-Fi makes it easier to consume on-demand content, which is an important driver for customer satisfaction. We were careful to check that the new box would satisfy customers. Every time we came up with a design change to improve cost or durability, we did our best to confirm that customers would like it. That was mostly a matter of holding focus groups.

Of course, many of the boxes we issue have been refurbished. But no one seems to mind as long as they work well and look great. Before we send out a box, we make sure it's fully functional and looks new. If the box breaks, we ship a replacement. We take care of all repairs and pay for the shipping. And we make regular upgrades to provide better functionality. A massive improvement in the user experience happened when we pushed our Sky Q software to more than a million customers in mid-2018.

McKinsey: *Owning the boxes has different financial implications from selling them. How do you manage those?*

Sebastian Hauptmann: We strive to provide a great service to our customers. Both the hardware and software are the means to that end. Since we deliver service on a monthly basis, we prefer to bill people in the same way for the set-top box they need rather than asking them to make a single, up-front payment for it.

The choice to monetize the set-top box on a recurring basis makes it more practical for us to own and lease the boxes and gives us a strong incentive to manage the total cost of ownership. In that respect, a cir-

cular design has clear financial advantages over a conventional design for both the provider and the customer.

McKinsey: *Where do you go from here? How do you capture more value?*

Sebastian Hauptmann: We see opportunities to use materials more efficiently. We're exploring ways to develop secondary markets for components, like hard drives, that still have utility after they fail. At the group level, Sky is aiming to eliminate single-use plastics from its supply chain as part of the Sky Ocean Rescue initiative. We will soon do this with the packaging for the set-top box. Now we're looking into redesigning the box's packaging to reduce the amount of cardboard.

We're also trying to virtualize Sky's service so it depends less on the box and gives customers more choice. With the new Sky Q software, for example, just one set-top box lets customers in the same household watch our service on up to five devices using smart TV apps or other existing equipment, such as game consoles. Before this, customers needed an additional smart card and set-top box for every room where they wanted to watch Sky's service.

We follow the mantra of "no hardware or great hardware." If a customer wants to use our service on a device other than the TV, we enable that with software. If a customer wants the best possible TV experience, we are happy to provide the hardware that allows this. We just want to ensure that our customers can enjoy great entertainment whenever and wherever they want to. ◾

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