Frothly

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REPORT

Coin-Operated

Microtransactions and the connected home.

Joe Chip · Dr. Cassia Orsellio

Human Factors · Sep 2025

SUMMARY

Connected appliances increasingly gate basic functions behind subscriptions and per-use fees. Some of those charges are disclosed at purchase. Many arrive later, in a software update, for features that once worked for free.

We bought 200 connected devices across twelve categories between 2018 and 2023 and tracked what they charged for through 2025. One in five began charging, after purchase, for features that had been free when it was bought.

KEY FINDINGS

01 One in five devices introduced new charges after purchase for features that originally worked without them.

02 Printers and cars were the worst offenders. Nearly half of printers in our sample restricted existing functions after purchase.

03 Per-use fees are spreading. 14 devices began charging per use for basic functions, including entry, brewing and laundry cycles.

04 Renters and older people bear the most cost, because they have the least control over the devices they live with.

01

The door that wanted paying

One participant in our study came home to find that the smart lock on his apartment door had begun asking for a small payment for each entry beyond a monthly allowance. The building's management system had accepted a firmware update that introduced the fee. He was, in his words, "arguing with my own front door about whether I was allowed to go home."

He paid. Most people do. This report is about how often that conversation is now taking place, in kitchens, laundry rooms, cars and hallways, and what can be done about it.

02

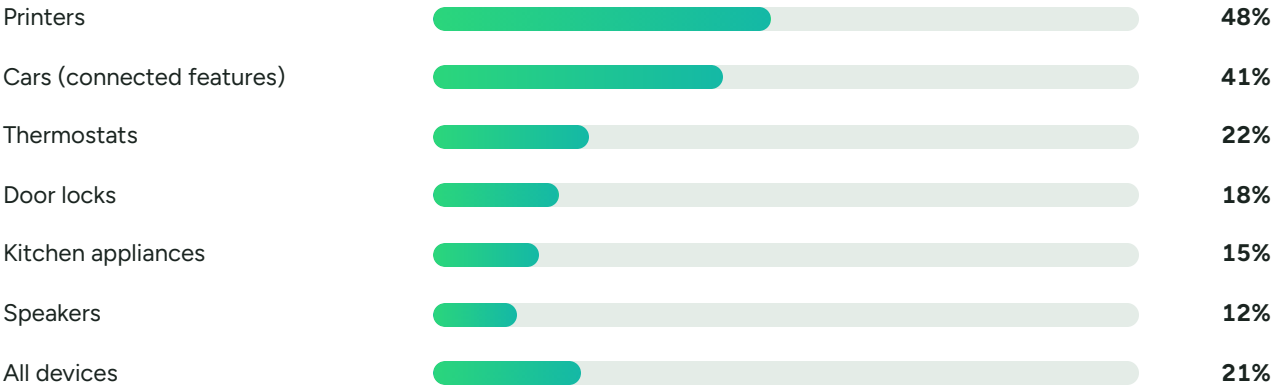
What we did

Between 2018 and 2023 we bought 200 connected household devices from major retailers, covering twelve categories, and set them up as an ordinary customer would. We then tracked every change in what each device would do without payment until the end of 2025, recording software updates, new subscription offers and changes to terms of service.

03

What we found

FIGURE 1 Share of devices that introduced new charges after purchase, by category



200 devices bought 2018–2023, tracked to December 2025. Selected categories shown.

TABLE 1 How devices began charging

Type of charge	Example from our sample	Devices
New subscription for an existing feature	Remote start moved behind a monthly plan	19
Per-use fee	A coffee maker that charged for each cup beyond a daily allowance	14
Consumable lock-in	A printer that refused third-party ink after an update	11
Degraded free tier	A thermostat that limited schedules unless upgraded	9
Ownership revocation	A speaker that stopped working when its service shut down	6

Some devices introduced more than one kind of charge.

04

Who pays

The costs do not fall evenly. Renters often live with devices chosen by a landlord or a building management system, which means they cannot refuse an update or replace a device that has started charging. Older participants were more likely to pay a new fee than to look for a workaround, and less likely to notice that a feature had ever been free.

Several participants reported something closer to unease than anger: the sense that the objects in their home had acquired an agenda of their own. One described her washing machine as “a coin-operated tenant who never pays rent.”

RELATED WORK

Some of these charges are accepted not by people but by automated agents acting for them, such as building management systems that install every supported update. Our colleagues at the Turing Registry examine that problem in The Law of Surprise (FR-P-2026-031).

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Recommendations

- Features available at the time of purchase should not be withdrawn or placed behind a new charge for the reasonable life of the device.
- Every recurring or per-use charge should be disclosed clearly at the point of sale.
- Devices should keep their core functions when their maker’s online service ends, through an offline mode or an open interface.
- Tenants should have the right to refuse updates that introduce new charges on devices in their homes.

References

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Acknowledgments

We thank the participants who let us into their homes, and their front doors, which were mostly cooperative.

About the authors

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