

User Interaction: The Epic Struggle for the Internet of Things

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THE EPIC
STRUGGLE OF
THE INTERNET
OF THINGS



BRUCE
STERLING

What the heck is the Internet of Things?



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The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment.

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The **Internet of Things (IoT)** is the interconnection of uniquely identifiable **embedded computing devices** within the existing **Internet** infrastructure. Typically, IoT is expected to offer advanced connectivity of devices, systems, and services that goes beyond **machine-to-machine communications (M2M)** and covers a variety of protocols, domains, and applications.^[1] The interconnection of these embedded devices (including **smart objects**), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a **Smart Grid**.^[2]

What the heck is the Internet of Things?

The internet of things (IoT) is a dynamic smart networked system with connected sensors, processors, and actuators that are designed to sense and interact with the physical world. Achieving the benefits of IoT requires the fusion and management of large scale heterogeneous data using knowledge-based decision systems and the integration of different technologies. Many challenges exist, including identifying things correctly and safely in IoT, modeling and integrating variety and volumes of data, acquiring knowledge automatically from the big data, and ensuring security and privacy, etc.

What the heck is the Internet of Things?







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Let's brainstorm.

What are some things that **will be** part of the Internet of Things in the future.

Let's brainstorm.

What are some things that **are a** part of the
Internet of Things now.



Sterling argues that this is the wrong way to think of the IoT.

Instead adopt a socio-technical perspective

There is technology here, but that might not be the important change.

“The real problem with this scenario is that the reader thinks he’s the hero of the story. To the vacuum company, he was the “customer” or “consumer”. In the legacy internet days, he was the “user”. In the Internet of Things, he lacks those privileged positions, “user” and “customer”.

“An Internet of Things is not a consumer society. It’s a materialised network society.”

“These devices don’t have to be bought by consumers. A fridge that talks to your toaster is useless. A fridge that talks to your landlord is a different matter; it’s a hack of the bourgeois property system. The Internet of Things can profit from that dicey relationship. The IoT will wrangle the insurance, the public safety issues, the reputation systems, the rental fees, the shrink-wrapping”



The image shows the Google logo in its classic multi-colored font. The letters are: 'G' in blue, the first 'O' in red, the second 'O' in yellow, 'g' in blue, 'l' in green, and 'e' in red. The logo is positioned in the upper left quadrant of the page. The background is white with a light blue header bar at the top and a light blue vertical bar on the left side.

Google

Google



Microsoft

Google



Microsoft



Google



Microsoft



Google



Microsoft



The components of control

“None of them are conventional corporations as corporations used to be known. The Big Five all have important central features that previous companies never possessed: **an operating system**, some dedicated way to sell **cultural material** (music, movies, books, software), **tools for productivity**, an **advertising business**, some **means of accessing the internet** that they themselves more or less control (tablets, smartphones, phablets), a **search engine** capability, a social network, a “**payment solution**” or some similar private bank, a “**cloud**” capability and, very soon, some dedicated, **elite high-speed access** that used to be the democratic internet.”

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Google



internet.”



The Internet of Things is the battle between these 5 companies

- Smart
- Profitable
- Capable
- Colossal
- Free of political constraints



Your relationship to these companies

- Not democratic
- Not capitalistic
 - This is not about selling a smart fridge
- **Digital feudalism**

“It’s not much like the scientific, military, anti-commercial “internet” was.

Instead, it’s much like a Holy Roman Empire. It’s full of obscure but powerful leagues and consortia, and baronies and dukedoms, and even some Free Cities. It’s about entities like General Electric, which has joined AT& T, Cisco, IBM and Intel in the all-American “Industrial Internet Consortium”.

It means the Europeanised “Smart Cities Council” of Mastercard, Bechtel, Alstom, Enel and Qualcomm, an alliance of actors who might seem completely alien to one another, but who suddenly

see the chance to conquer whole towns.”



These companies don't compete

- The attempt to destroy ["disrupt"] the ecosystem of the other

"Google will nevertheless continue to run Google +, even at a grinding financial loss if necessary, merely to slow the growth of the blinding lump that is Facebook. Microsoft, for its part, will cheerfully run the search engine Bing at a loss, for the sake of hampering Google's freedom of action."



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"Industry observers marveled at Google's astral lack of business sense when Google gave away a functional, open-source smartphone operating system. Not only did Google make no money from this action – in order to defend the Android OS, Google bought and promptly destroyed a perfectly functional American electronic hardware manufacturing company, Motorola. Motorola was burned at the stake as the price of maintaining Android. However, this Byzantine manoeuvre was worth it, because Nokia went down in flames, Microsoft was defeated, Apple was belittled and Android is now the planet's dominant smartphone system."



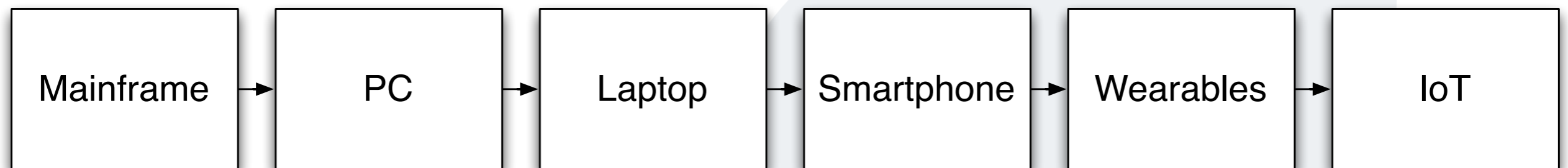
The Manifest Destiny of Silicon



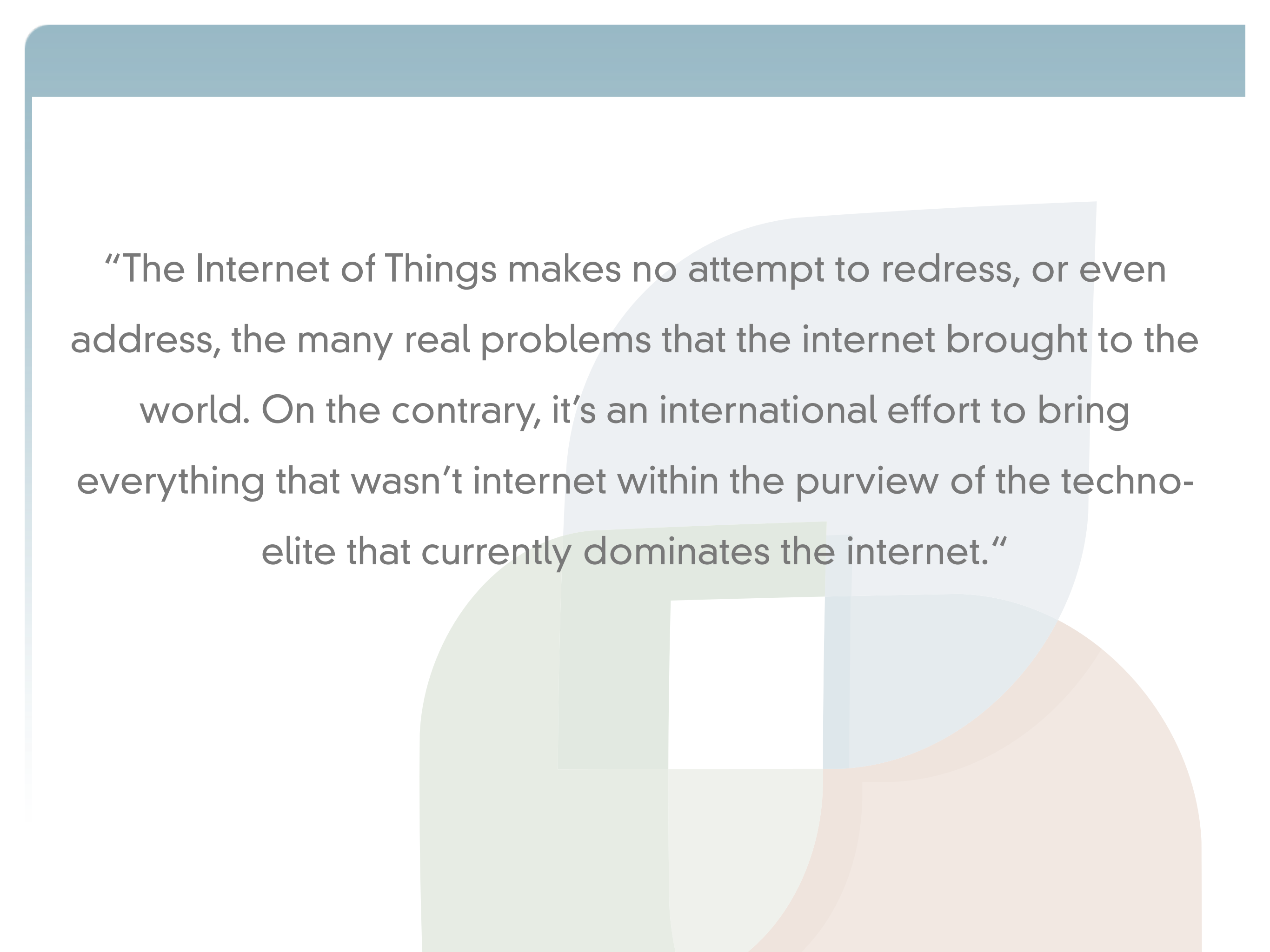
The Manifest Destiny of Silicon

“electronically automate through digital surveillance by wireless broadband”.

The Manifest Destiny of Silicon



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“The Internet of Things makes no attempt to redress, or even address, the many real problems that the internet brought to the world. On the contrary, it’s an international effort to bring everything that wasn’t internet within the purview of the technolite that currently dominates the internet.”

What will the IoT really look like?



Microsoft

Google



“If the reader is enamoured with the IoT, the reader should think hard about the implications of a Microsoft kitchen.

Or a Microsoft car. Or, as London currently has, a Microsoft Internet of Things subway system.”

What will the IoT really look like?



Microsoft

Google



“Amazon is underestimated, because its fantastic logistics enterprise actually does resemble an authentic “internet” that packages and ships a host of “things”. But imagine Amazon subways. The Internet of Things is not a world where Amazon literally buys, owns and manages your subways. Instead, it’s a world where Amazon’s skills at logistics have crushed the subway unions and are managing the riders as if they were packets in one of Amazon’s gigantic robotic distribution plants.”

What will the IoT really look like?



Microsoft

Google



“Google smart cars, for instance, are very Internet of Things – self-driving broadband robots using meticulously mapped highway databases generated and maintained with Big Data. Modern highways, without self-driving cars, are slaughterhouses. They kill more people than major wars.

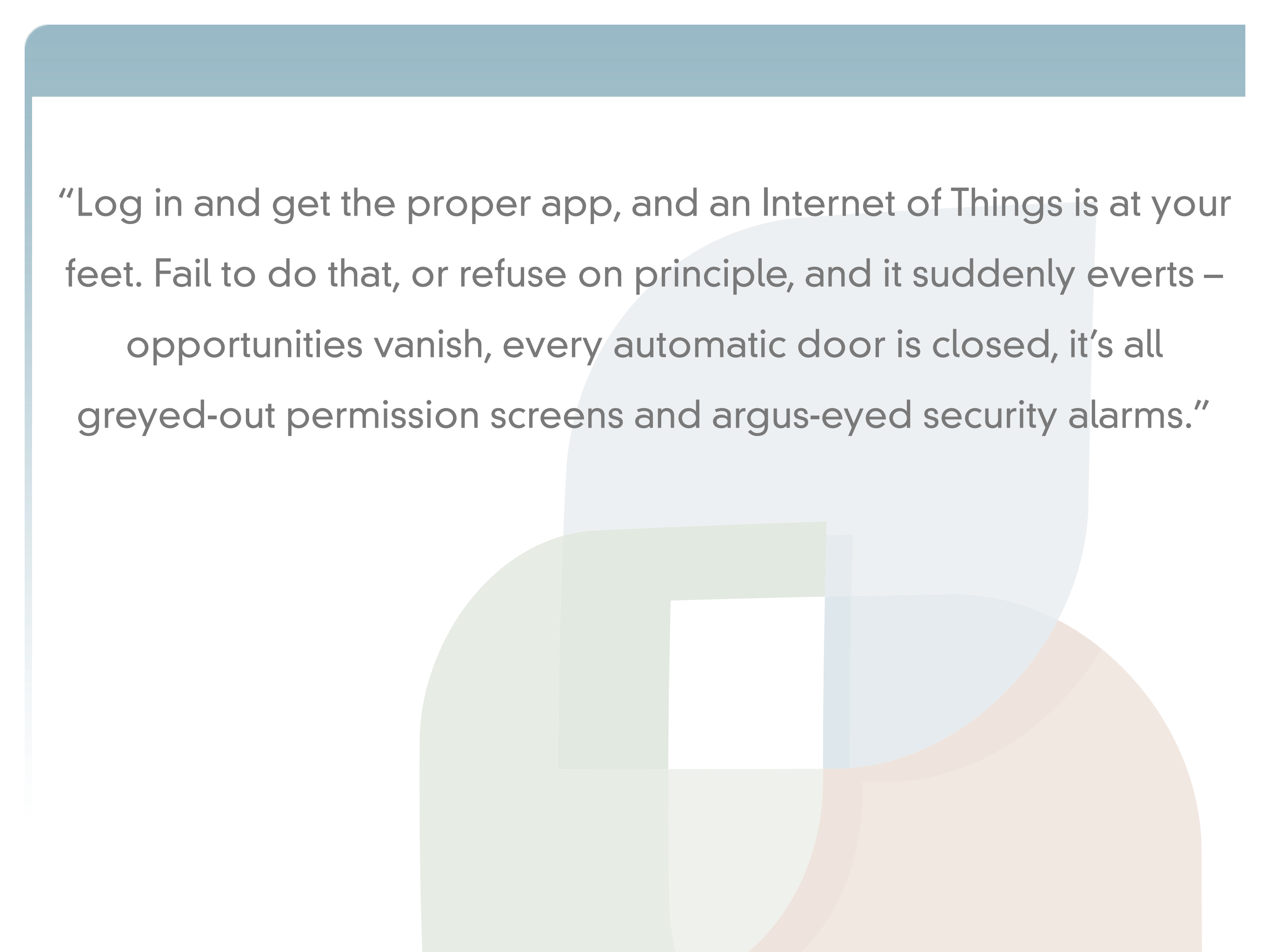
“Smart City” parking means a bonanza in traffic fines for cities. That is why city managers really like the idea. It also means that legal parking becomes more efficient and children breathe less smog.”

“It’s not the newness of the Internet of Things that is bad. Its good and bad aspects are ethical, legal, social, political. They’re human. The IoT isn’t a social reform movement, or a source of progress, any more than Amazon, Facebook, Google, Apple and Microsoft are reformers seeking progress. It’s better in some ways, worse in others; mostly, it’s just different. The clues to that future culture are already here.”

Thought exercise:

What would a university run by Facebook or Apple be like?

“I don’t recite these colourful and spiteful quarrels merely to scold the participants. They’re not small struggles, they’re epic struggles, although they differ radically from struggles of a normal political or economic kind, with cash, or votes, or lawsuits. I believe this is the native activity of the Internet of Things, and I like to call it “**wrangling**”. Wrangling is what the Internet of Things is like as a lived, mid 21st-century experience. Voting isn’t enough; suing isn’t enough; buying isn’t enough; even using isn’t enough. Instead, there’s this other, emergent form of networked struggle.”



“Log in and get the proper app, and an Internet of Things is at your feet. Fail to do that, or refuse on principle, and it suddenly everts – opportunities vanish, every automatic door is closed, it’s all greyed-out permission screens and argus-eyed security alarms.”

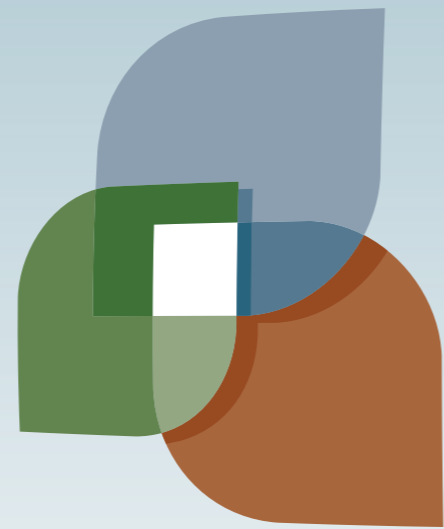
Shaping Things

“The only sane way out of a technosociety is through it, into a newer one that knows everything the older one knew and knows enough new things to dazzle and dominate the denizens of the older order. That means revolutionizing the interplay of human and object. It means bringing more attention and analysis to bear on objects than they have undergone. It also means engaging with the human body and its affordances, with our health and our ease and our comfort, with our working environment, with our lungs and our skin and our bones.”



“I hope you are the kind of person that can do it”





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