

Social and Energy Implications of On-Demand Digital Services

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ESA SSTNET Virtual Workshop
12 September 2023



European
Research
Council

Consolidator Grant
#101003083



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A Day in the Life of Emma

8 am



Takes an Uber to work

10 am



Listens to Spotify at work

1 pm



Orders a gift from Amazon Prime

8:30 pm



Orders milk for tomorrow's breakfast from Milk & More

7:30 pm



Winds down watching Netflix

7 pm



Orders dinner from Deliveroo

On-Demand Digital Services

- Services that enable companies or individuals to supply products or services **immediately** at the request of the customer through **the use of online applications or platforms** (Taylor, 2018; van der Burg et al., 2019).

More time sensitive



Less time sensitive

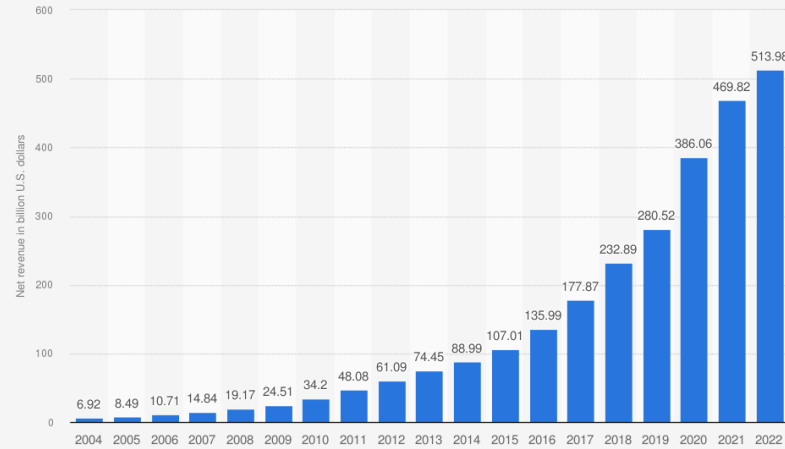


Domains	Example of Application	Themes			
		On-Demand	Sharing Economy	Dematerialisation	Subscription
Entertainment	Netflix	X		X	X
	Spotify	X		X	X
	Kindle	X		X	
Travel	Uber	X	X		
	BlaBlaCar		X		
	AirBnB		X		
Retail	Deliveroo	X			
	Getir	X			
	Amazon Prime	X			
	Hello Fresh				X
	Olio		X		



On-Demand Services at a Glance

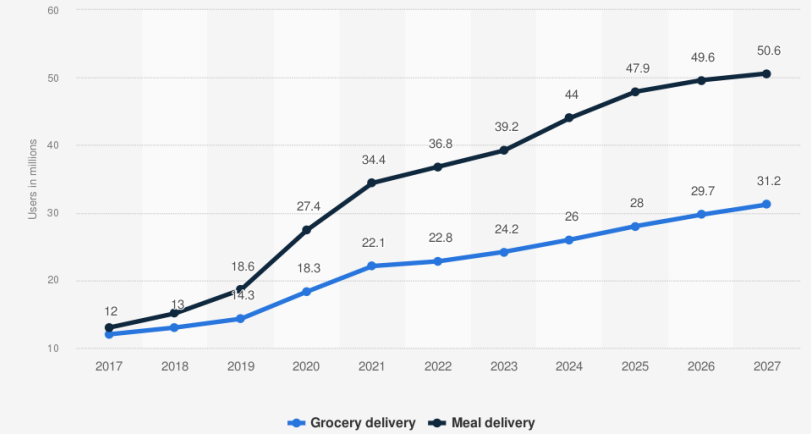
Annual net sales revenue of Amazon from 2004 to 2022 (in billion U.S. dollars)



Source
Amazon
© Statista 2023

Additional Information:
Worldwide; Amazon; 2004 to 2022

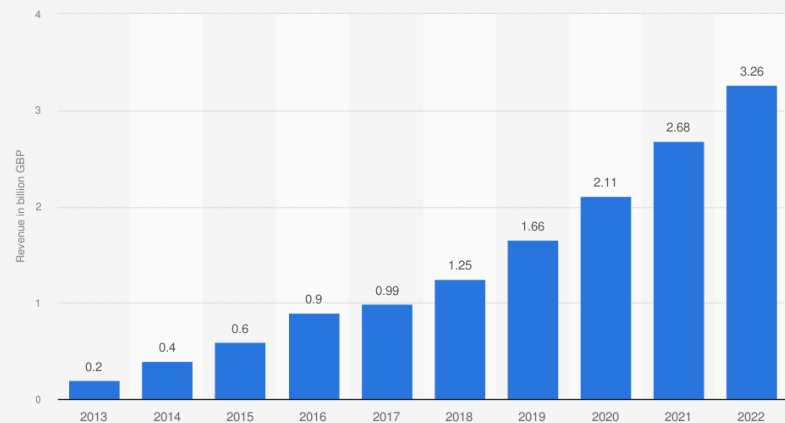
Number of users of the online food delivery market in the United Kingdom from 2017 to 2027 (in millions)



Sources
Statista Digital Market Insights; Statista
© Statista 2023

Additional Information:
United Kingdom; Statista Digital Market Insights; 2017 to 2027

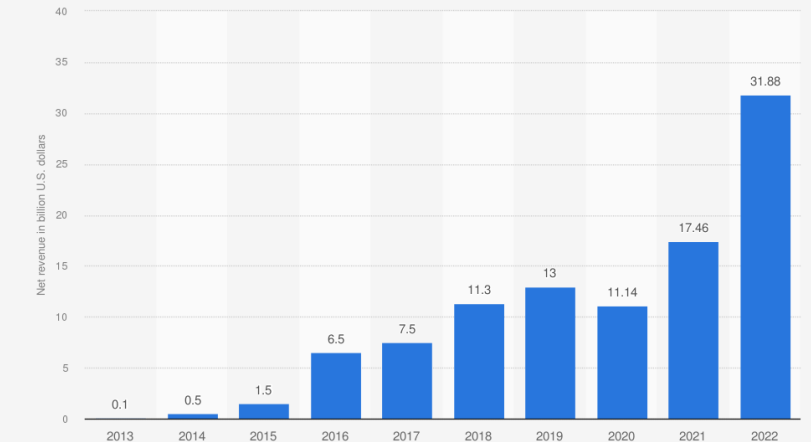
Subscription video-on-demand (SVOD) revenue in the United Kingdom (UK) from 2013 to 2022 (in billion GBP)



Sources
Olcrom; Ampere Analysis
© Statista 2023

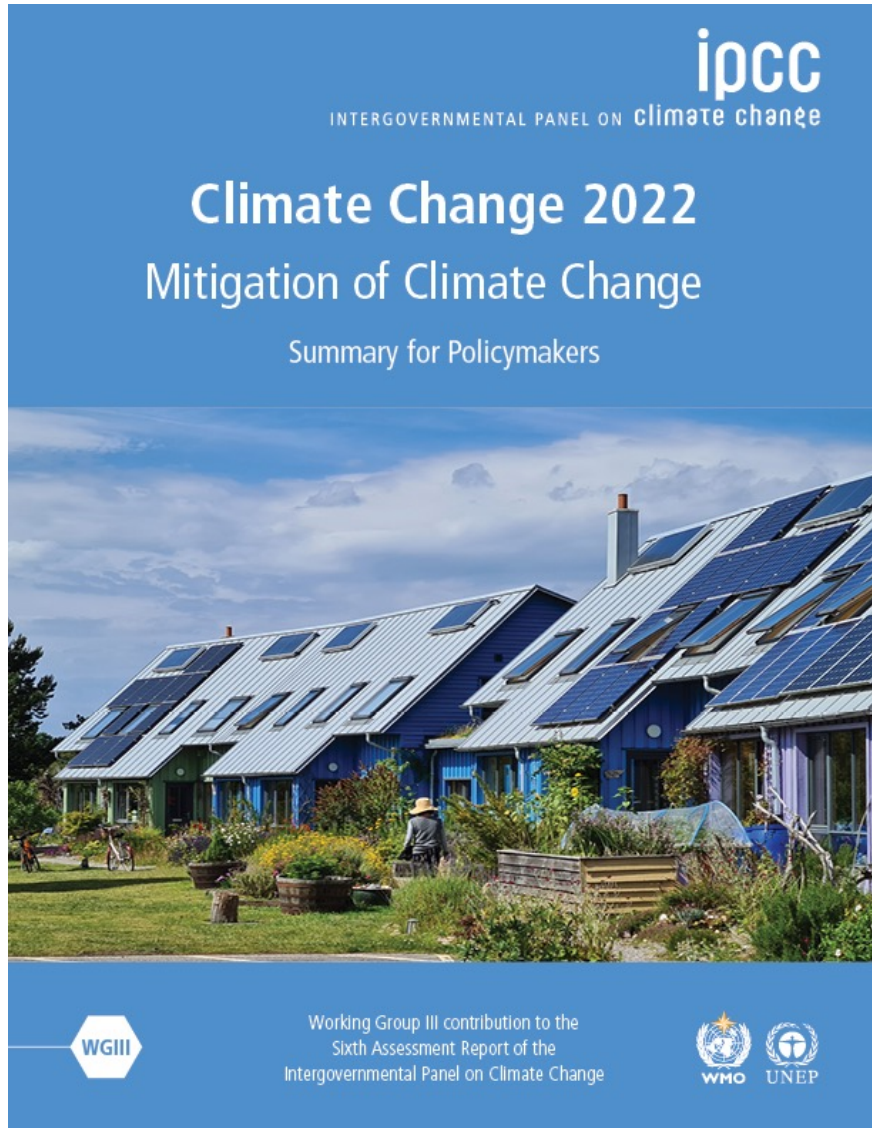
Additional Information:
United Kingdom; Ampere Analysis; 2013 to 2022

Global net revenue of Uber from 2013 to 2022 (in billion U.S. dollars)



Source
Uber
© Statista 2023

Additional Information:
Worldwide; Uber; 2013 to 2023



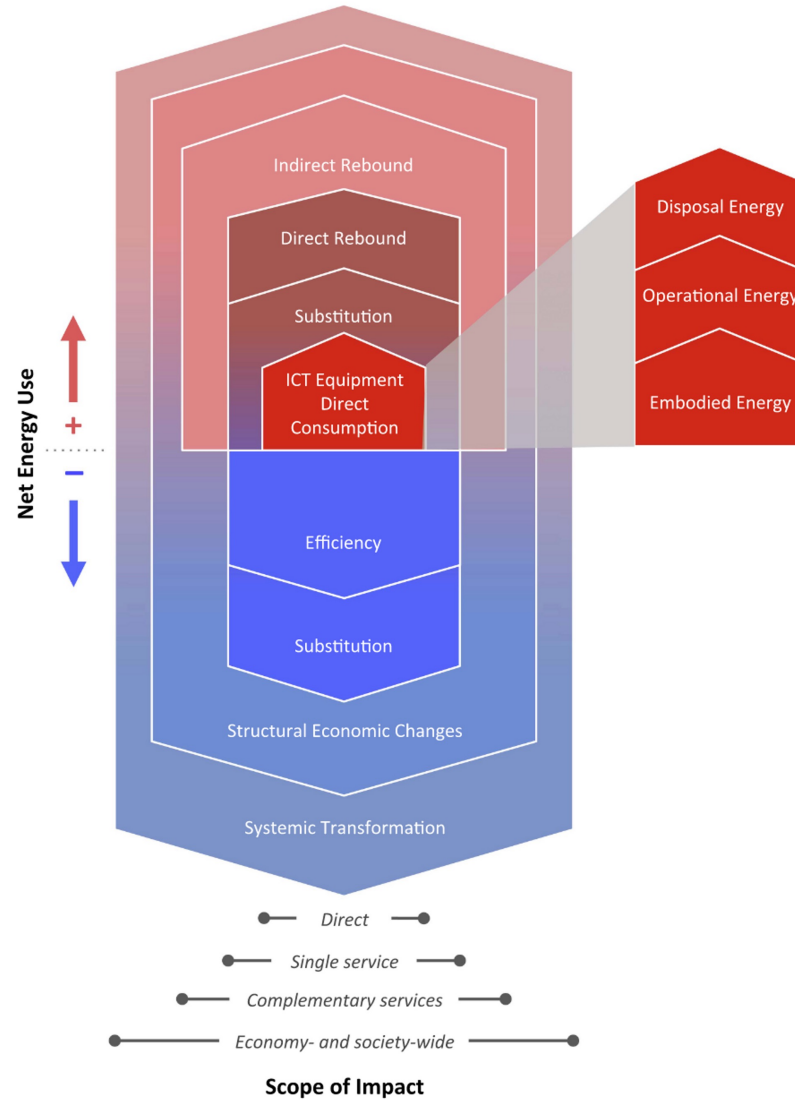
Chapter 5: Demand, Services and Social Aspects of Mitigation

Alternative service provision systems, for example **those enabled through digitalisation**, sharing economy initiatives and circular economy initiatives, have to date **made a limited contribution to climate change mitigation** (*medium confidence*).

While **digitalisation** through specific new products and applications **holds potential for improvement** in service-level efficiencies, without public policies and regulations, it also has **the potential to increase consumption and energy use.**

(Creutzig & Roy, et al., 2022)

ICT Energy Effects



The net effect of digitalisation on energy is highly dependent on a multitude of confounding factors, **particularly human behaviour.**

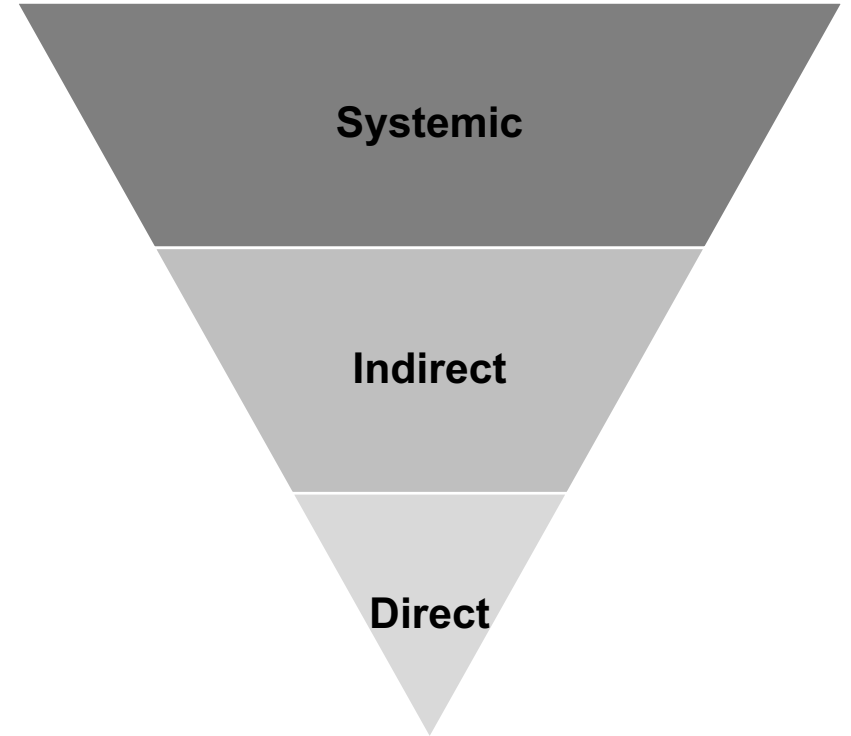


Figure 2. Taxonomy of ICT energy effects. Red effects increase energy use, blue effects decrease energy use, and shading intensity decreases as effect scope increases. (Effect magnitudes are only illustrative and not to scale.)

(Horner, Shehabi, Azevedo, 2016)

Research Questions

1. How do households domesticate on-demand digital services?
2. How do on-demand digital services shape households' expectations of needs fulfilment and consumption patterns?
3. What are the impacts of on-demand services on macro-level consumption patterns?
4. What are the climate implications of consumption via on-demand digital services?



Photo by [Claudio Schwarz](#) on [Unsplash](#)



Theoretical Background



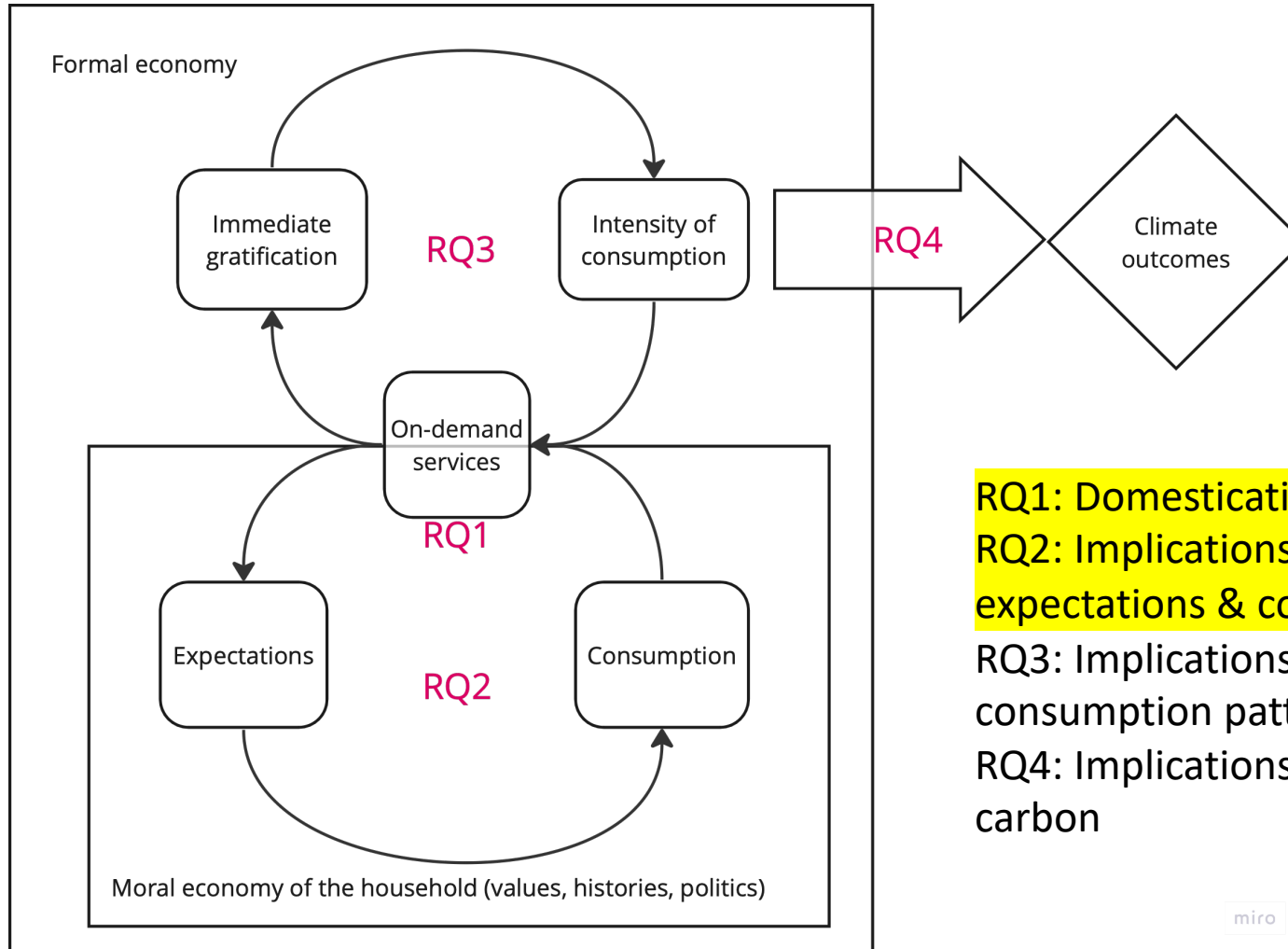
Domestication Theory (Silverstone, Haddon)

- How technological artifacts become integrated ('domesticated') into daily lives and what meanings they come to possess
- Moral economy of the household
- Micro-social (households) and macro-social links

Sociology of Consumption

- Consumption not just as utilitarian economic transaction, but as embedded in social behaviour to perform one's identity or status
- How society is organised around consumerism with implications on the production, distribution, and disposal systems associated with such consumption

Conceptual Framework



RQ1: Domestication of ODS in households
RQ2: Implications of ODS on households' expectations & consumption

RQ3: Implications of ODS on macro-level consumption patterns

RQ4: Implications of ODS on energy and carbon

miro



Sample

- **iDODDLE Living Lab:** Households in real-world conditions in their own homes but committed to trial, learn, interact and share data with the research team
- 14 households in Oxfordshire, 20 individuals interviewed

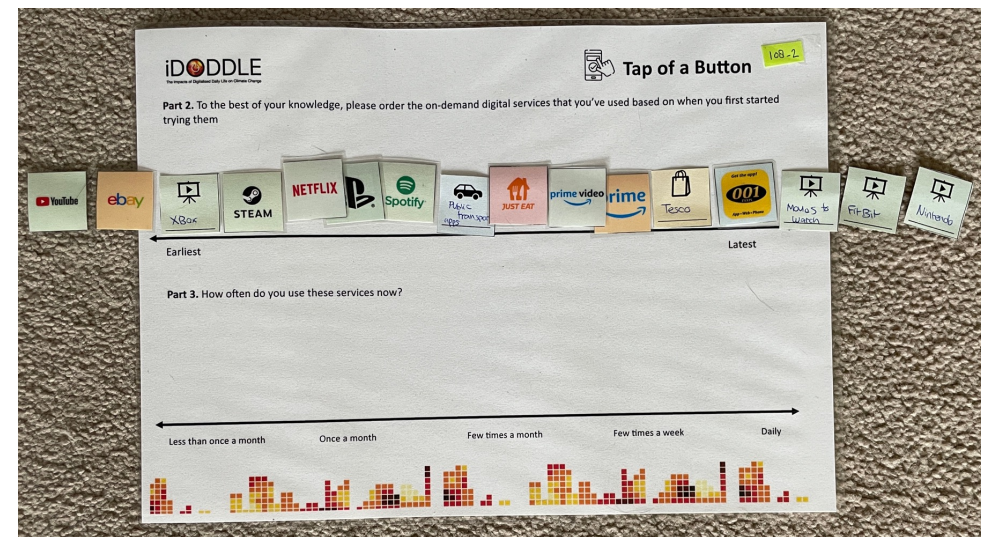
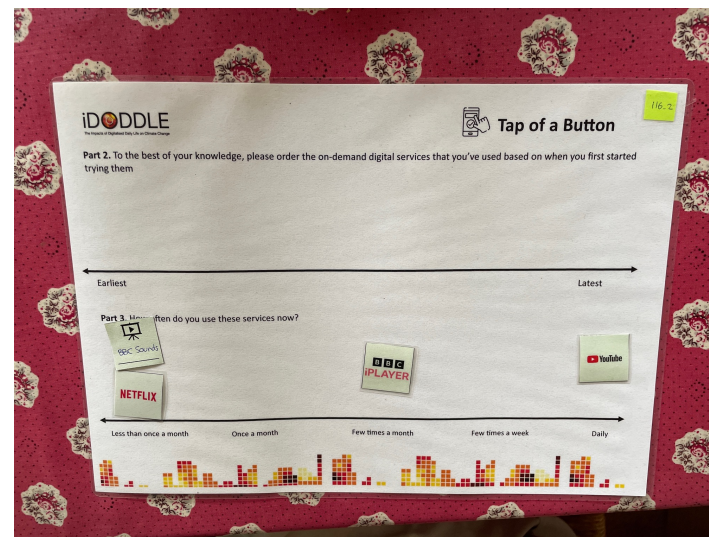
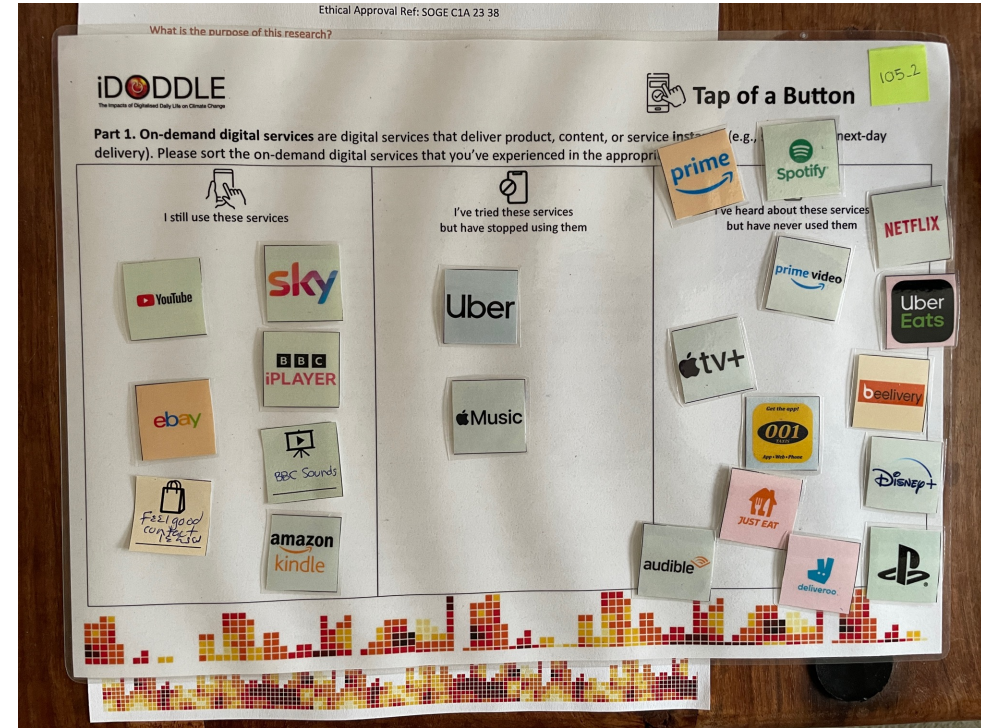
Types of Household		Age Group		Gender	
Single	2	30-39	7	Female	11
Couple, no children	5	40-49	3	Male	9
Single parent, with children	2	50-59	5		
Couple, with children	3	60-69	2		
Empty-nesters couples	2	70-79	2		
		80-89	1		

- Limitations: mostly urban, educated, middle- to high-income



Methods

- In-depth semi-structured interviews supported with interactive card games
 - Baseline interview and survey
 - Topical interview
- 3-month on-demand services experience (ongoing)
- Post-experience survey (ongoing)





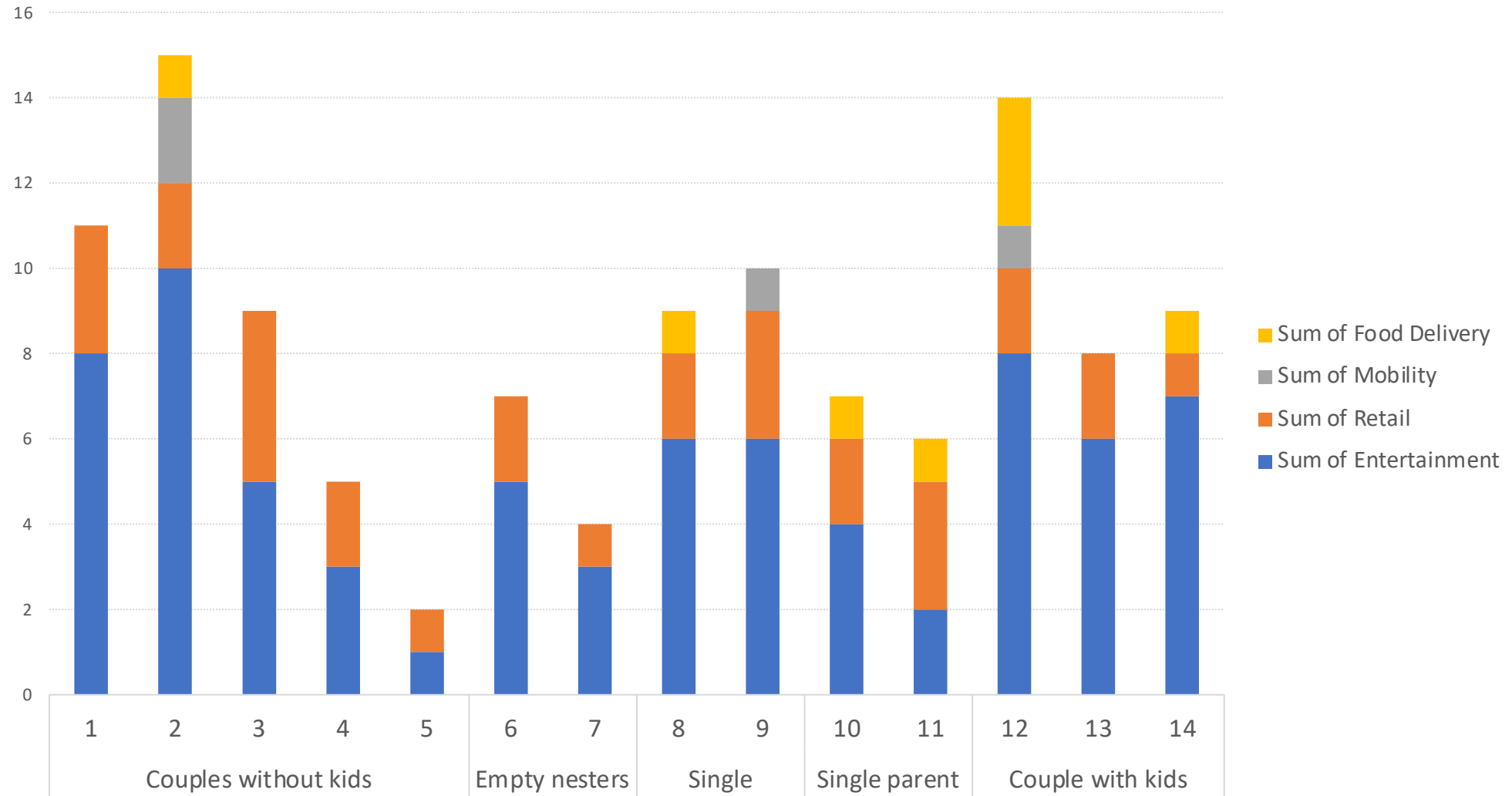
ODS Usage



● 0 ● 1 ● 2-5 ● More than 5

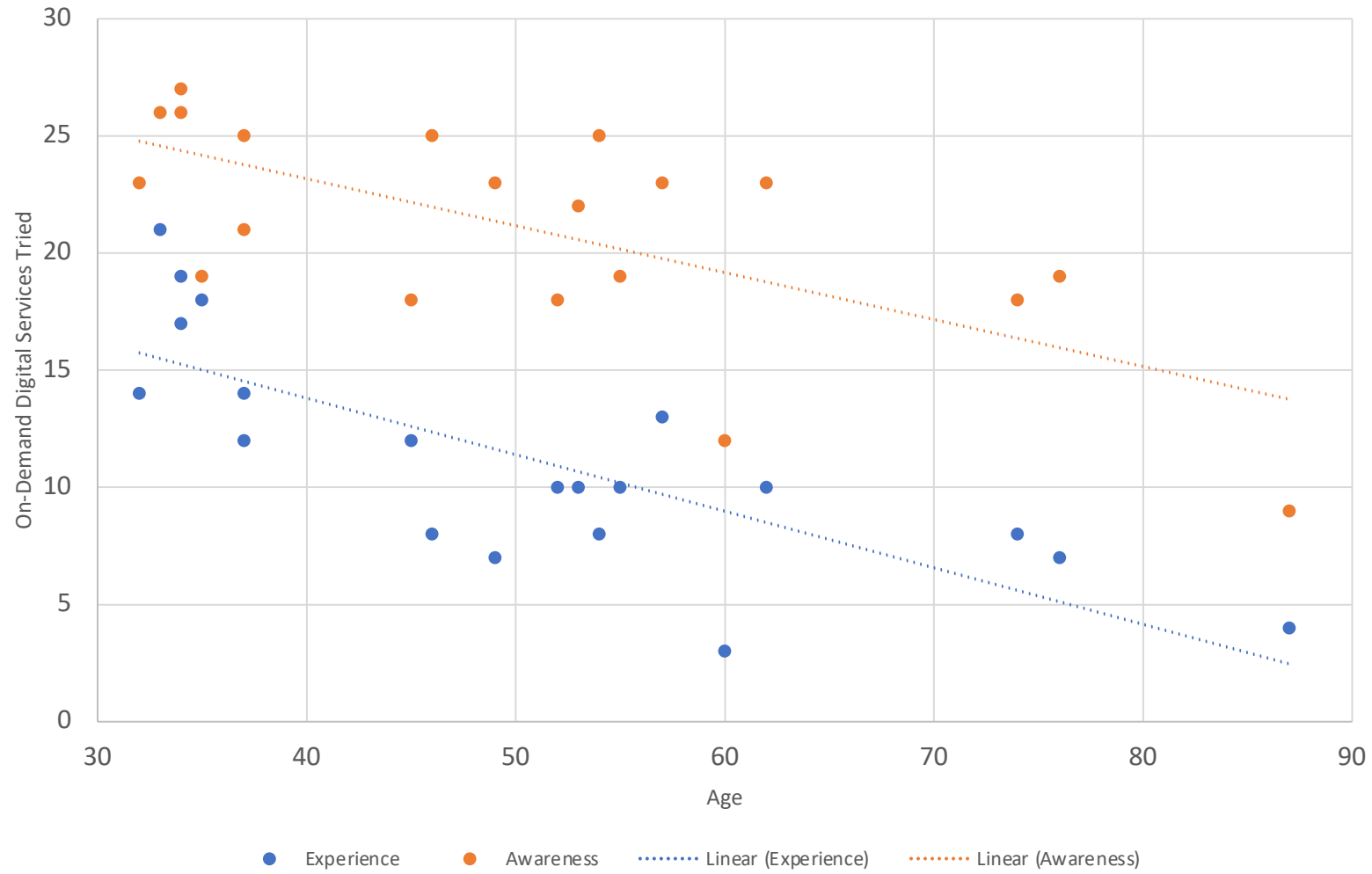


Use of On-Demand Digital Services by Household Type





Awareness and Adoption of On-Demand Digital Services by Age



Preliminary Findings

1. Domestication of ODS is a **constant negotiation** between the identities and values of the households, current life circumstances, physical constraints, and market forces. The negotiation often causes dissonance between beliefs, intentions, thoughts, and actions of households.
 - Domestication is rarely a "harmonious" process (Sorensen, 1996)
 - Domestication is never finished -- re-domestication or adapting and morphing to meet the changing needs of users, the constitution of households and workplaces (Berker et al., 2006)



Image by vectorjuice on Freepik

Amazon. I don't love that it's the Amazon. We do sometimes try and be like, let's buy less off of the Amazon, we don't really want to give Jeff Bezos more money.

It's that it's very much a situation where we do not like the company, but sometimes the convenience and the price win out over that. Or the ability to get it at all.

Domestication Journey

iD**🔌**DDLE

Successful (6 households)

Precarious (5 households)

Forced (3 households)

Factors:

- Life circumstances
- Identities
- Values
- Household composition

Constraints:

- Price
- Availability

- Actively seeking
- Early adopter

- Word of mouth, promotion
- Wait and see
- Covid-19

- Hesitant
- Late adopter
- Limitations on skills and devices

- Online-first
- Permeates various aspects of daily lives
- Concerns around features, privacy

- Integrated into omnichannel experience
- Concerns around scams

- Prefers offline alternative unless no other choice

- Part of everyday conversation
- Identity as digitally-engaged

- Product/content rather than service
- "Can live without"

- Feeling left behind

2. Households have higher time sensitivity for entertainment, mobility, and food delivery, but retail is gradually catching up. Households see the overarching trend of **digital services delivering products at a faster rate.**

- Convenience
- Delivery assistance
- Emergency
- Time
- Options
- “Connection to the world”

ODS take on meaning as part of the “**fabric of society**” and **fast delivery becomes the new normal.**

The perception of ODS’ pervasiveness feeds back into households’ domestication process.



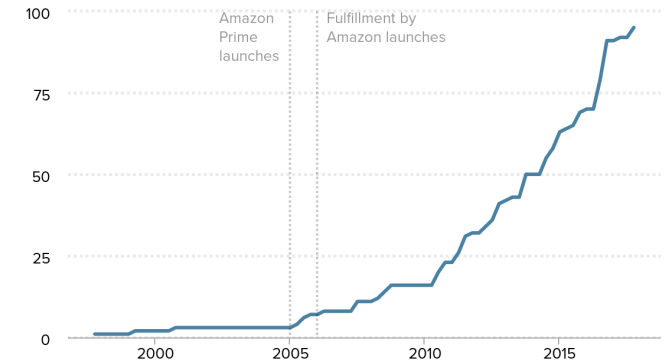
Designed by slidesgo / Freepik

I think they used to maybe be more of a, not luxury, but like a kind of added nice thing to have. Whereas now they are like so much part of our everyday life and how we... Yeah, learn about the world as well and share things with each other.

Demand Pull or Market Push?

- Amazon Prime established in 2007 - “Our vision was that fast delivery should be an everyday experience—rather than an occasional indulgence, and many sceptics thought we were crazy.” (Amazon, 2018)
- Households applaud fast delivery, but say they are “willing to wait”
- Fast delivery vs cost trade-off
- Concerns about workers’ welfare, safety, environmental impact

Total number of Amazon fulfillment centers
Cumulative openings, 1997—2017



Source: Fulfillment center opening dates compiled from Avalara (“Amazon Fulfillment Center Locations,” accessed October 2017), Guided Imports (“The Complete List of Every Amazon Warehouse and Distribution Center in the World,” last updated April 2017) and MWPVL International (“Amazon Global Fulfillment Center Network,” accessed October 2017).

Economic Policy Institute

There was, I think, a little time after we stopped having Prime and I was like, oh, this is annoying now that I have to wait this long. I got this thing, I got too used to it. But you know again that recognition is like, wow, nobody needs this product in a day's time. Like, I just don't need anything that fast.

3. Households perceive that ODS increases society's expectations of **immediate gratification** and **induces consumption**.

- High users of ODS notice changes among themselves: impatience, free fast delivery as the minimum standard
- Induced consumption is driven by marketing ploys like Prime Days, minimum order for free delivery, free returns

I think, I probably have less patience... I think maybe slightly less so for like meal food delivery services, because obviously that's constrained a bit more by where you're located and what's available in the place, but, yeah, definitely. I have expectations of being able to get stuff quickly and yeah, having a big selection.

I mean a lot of this stuff is really just enabling more consumption.





Implications on Climate

- Hidden environmental cost of convenience
- Expedited order fulfilment, especially last-mile delivery will have significant implications on energy and carbon.
 - “Resource-intensive expectations of convenience and speed of product delivery translate into a dangerous reliance on fossil fuels.” (Meier, 2023)
- Convenience of (reckless) returns
- Induced consumption as rebound effects
- Over-consumption and its environmental consequences (Miller, 2012; Evans, 2019)



Next Steps

- Follow-up interviews with living lab households
- Co-designing and piloting survey on ODS and consumption expectations with living lab households
- Scaling up survey on UK households
- Understanding the energy and carbon implications



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iDODDLE

Thank you!

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