

# Transforming the Future of Work through Human-Centred Design

Abigail Sellen

Lab Director  
Microsoft Research Cambridge, UK

# Transformations in work

The pandemic was a time for massive change, as well as reflection and learning ...



about how we get our work done



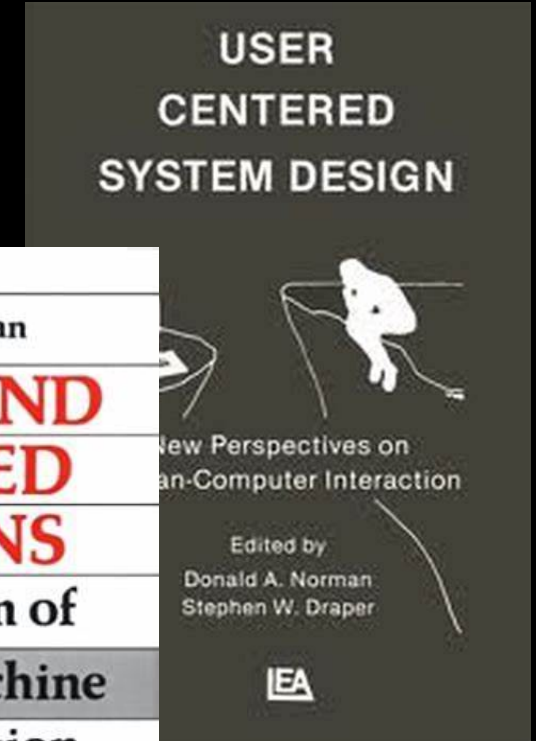
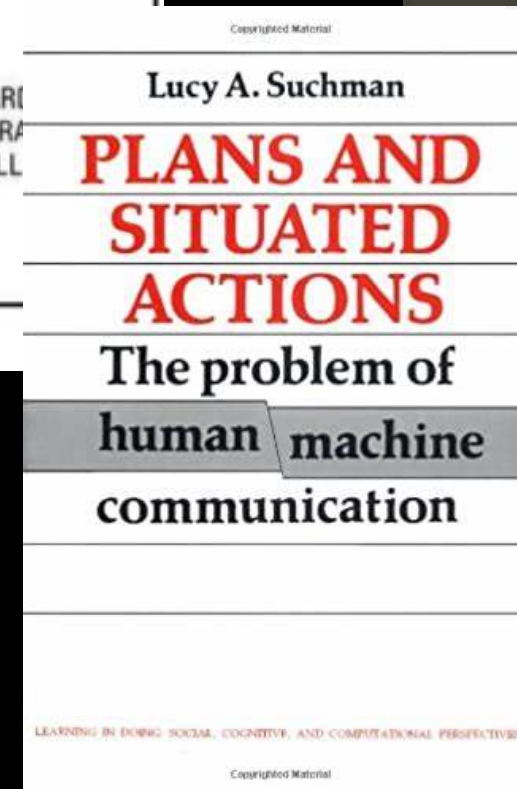
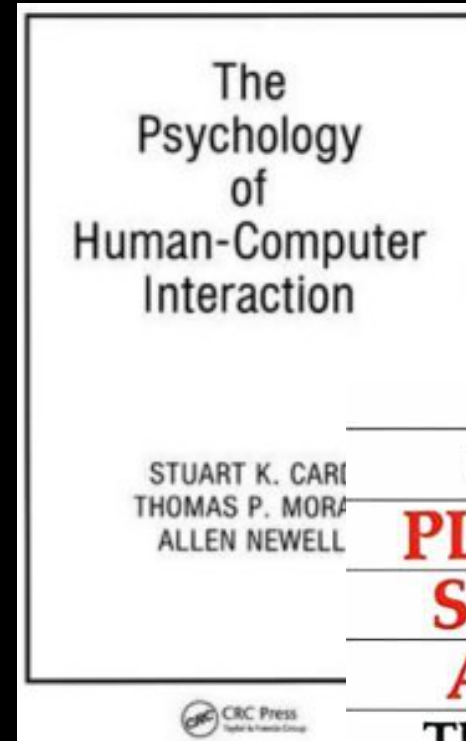
about the place of work in our lives



about the world and how others are coping

# The Role of HCI

- Helping us toward a more human-centric future
- A legacy of research, going back to our roots
- Working with industry to make changes



# Structure of This Talk

1. Looking back: What the pandemic taught us
2. Where we are now: The pivot to hybrid
3. Shaping the future: What we can do



Looking Back

# Microsoft's Future of Work Initiative

- 50+ research studies run across the company during the pandemic
- Included research and applied researchers in Azure, Office, Windows, Xbox, Github, and LinkedIn
- Led to a [2021 report on the future of work](#)
- See [The New Future of Work - Microsoft Research](#)

## The New Future of Work

Research from Microsoft into the Pandemic's Impact on Work Practices

The coronavirus pandemic not only caused a public health crisis, it also caused technological, social, and cultural disruption. This past year, people across the globe experienced a rapid shift to remote work that upended their existing practices and will have long-term implications for how work gets done in the future. Looking forward, we expect that some of those who used to work from offices will continue to work remotely, while others will adopt hybrid models that will involve a combination of working from the office and working remotely. The current moment presents a unique opportunity to understand the nature of work itself, to improve remote support for a range of work practices, and to use what we have learned through remote work to improve in-office and hybrid practices.

As a company whose mission is to empower every person and every organization on the planet to achieve more, it is vital that Microsoft understands the massive transition currently underway so that we can help our customers come through this challenging time stronger and more resilient. We are all right now participants in a giant, natural, uncontrolled remote work experiment from which Microsoft must learn. Just as research has been fundamental in developing ways to prevent and treat COVID-19, it is also fundamental to understanding and supporting evolving the sociotechnical work practices.

At the start of the pandemic, researchers from across Microsoft formed an ongoing cross-company initiative to coordinate efforts with the goal of understanding the impact of remote work and identifying opportunities to support new working practices. The initiative consists of over 50 research projects conducted by teams that span a range of disciplines (including engineering, research, marketing, human resources, and facilities) and divisions (including Microsoft Research, Office, Windows, Azure, Xbox, GitHub, and LinkedIn). The projects employ many different methodologies, ranging from small-scale, formative interviews with customers to large-scale modeling exercises and even EEG measurements of electrical impulses in the brain.

This report provides a synthesis of the findings from these many research projects. We believe it represents the largest compilation of research related to the pandemic's impact on work practices available to date. The findings highlight a number of acute challenges and suggest opportunities to develop new work practices that are more efficient, equitable, and energizing. Work will never again be the same. With care and effort, however, we hope to make it better.

*Jaime Teevan (Chief Scientist, Experiences and Devices)*

# Selected Findings

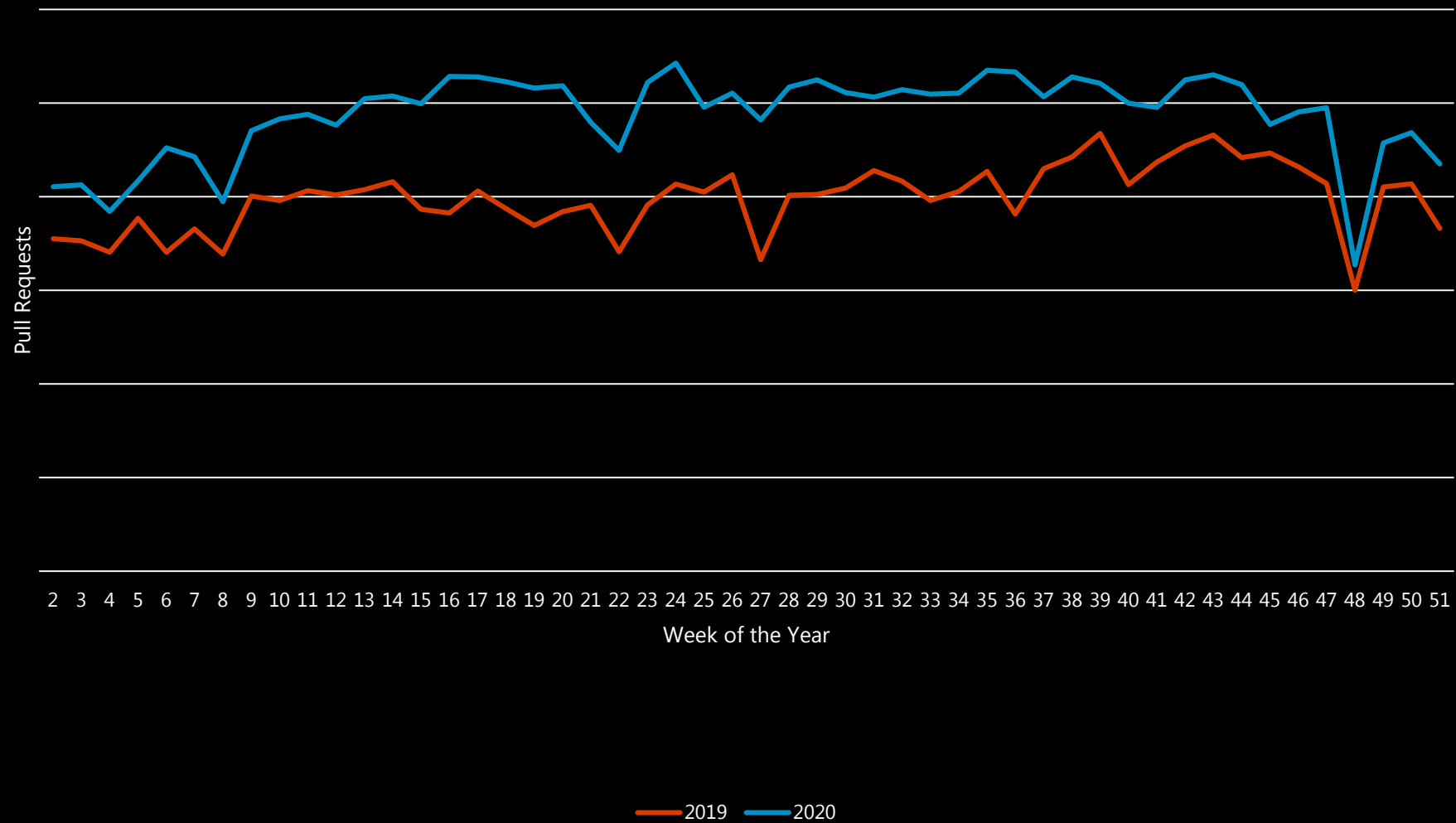
1. Personal Productivity and Well Being
2. Social connection
3. Collaborative Interaction

## Productivity & Well Being

People were managing to be productive  
but often at a cost

# Key Findings: Self Reports of Productivity

- Surveys during 2020 found about **equal splits of people** (35% each) reporting being more or less productive at home
- And being **more or less satisfied** with their jobs working from home



Weekly pull requests over time.

Source: Chandra Maddila. 2020. *Nudge study (Developer Productivity Trends during COVID-19)*. Microsoft (Internal).



# Productivity comes at a cost...

"I'm trying to do the best job I can, it's just **so much more work**"

"It's seems to be getting more **and more difficult** to be productive. And I feel **pretty worn out**. It could be because I **worked most of last weekend**"

# Key Findings: Thrivers and Survivors

The research showed a number of factors at play for whether information workers felt productive:

- Prior WFH experience
- Layout and privacy of workspace
- Needs of co-habitants, such as children



Source: Jenna Butler and Sonia Jaffe. 2020. Challenges and Gratitude: A Diary Study of Software Engineers Working From Home During Covid-19 Pandemic.

# Benefits and challenges of WFH\* are linked



## Pros

Flexibility

No commute

More time with family\*

Easier to intersperse exercise

Fewer work distractions

## Cons

Lack of structure / Longer workdays

Blurring the boundary between home and work

More non-work distractions

More sedentary - physical discomfort

Isolation & communication challenges & lack of visibility

Stress / Emotional exhaustion / Burnout



# Productivity is Personal

- Work needs to be understood within the context of people's larger lives
- Shift from a focus on productivity to well being
- **Result** was changes in work practices, new initiatives around well-being, and new technologies to promote well-being.

## Social Connection

Remote work risked eroding our social capital

# Key Findings

Microsoft top words: "Isolated,"  
"disconnected," and "lonely"

Meta analysis: Remote I/Ws missed office  
interaction, felt isolated and less able to  
share concerns with co-workers than onsite  
workers



Sources: Emily Peloquin, Sheri Panabaker, Patty Clusserath, Nalini Iyer, Hope Idaewor and Emily Downing. 2020. CSEO WFH Study/GESS (Global Employee Satisfaction Survey).  
Charalampous, Grant, Tramantano & Michailidids, 2018



They missed **spontaneous** interaction...

and **serendipitous** interaction

"Part of me thinks that **what used to be a 5 minute drive-by** in a hallway is now a **30 minute meeting.**"

(Participant 676)

"The biggest risk is that we become **locked in our bubbles.** We don't get the general mood or the **coffee break gossip** which is an **essential glue** to create the bond between coworkers."

(Participant 642)

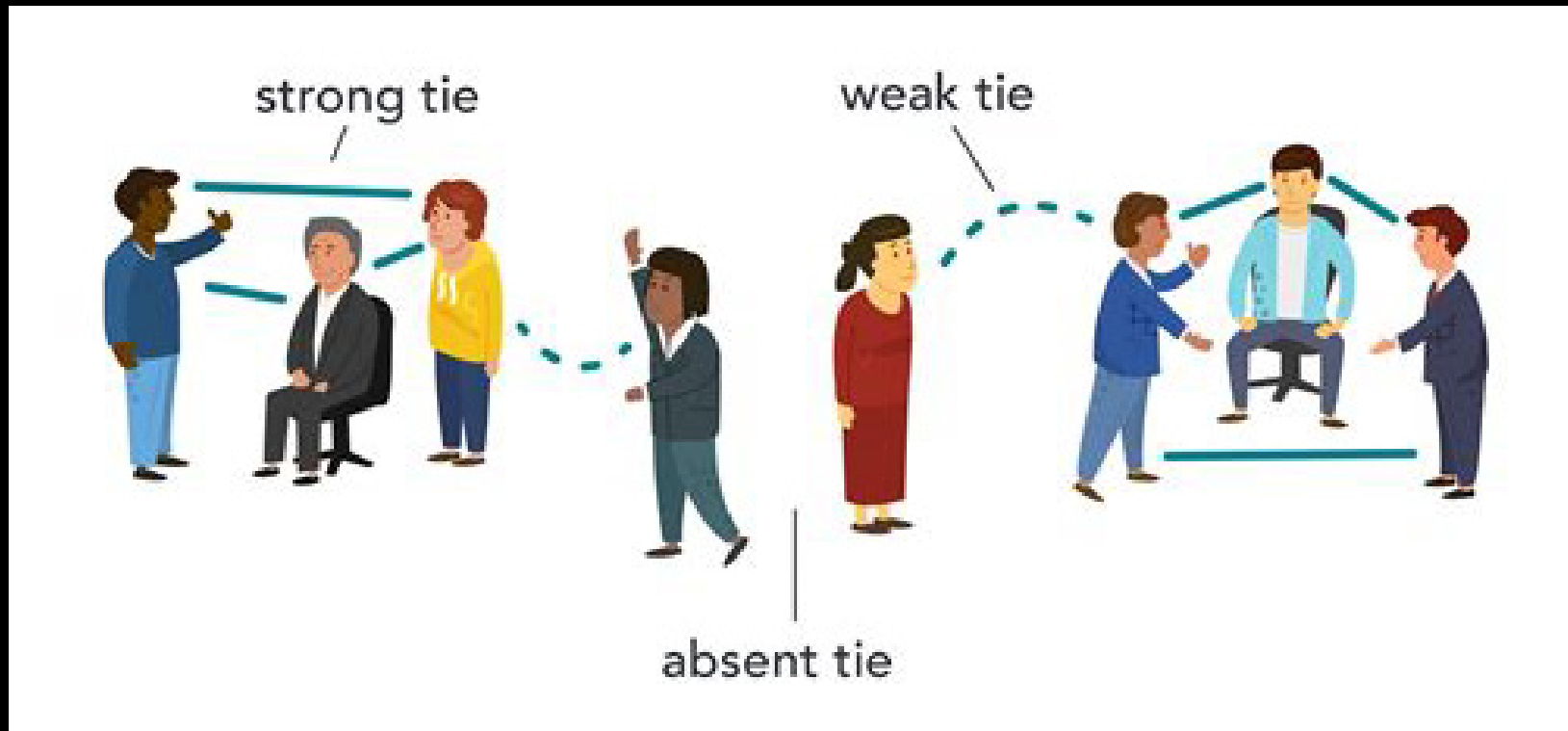
# The Erosion of Social Capital

"The value that accrues to individuals and organizations from their relationships."



# Social Capital Boosts Organizational Success and Employee Wellbeing



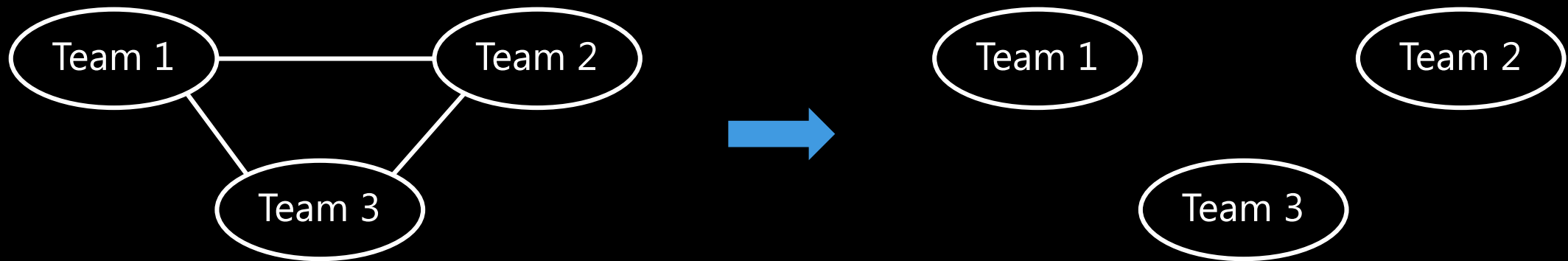


**Bonding**  
"Social Superglue"

**Bridging**  
"Social Lubricant"

# Shrinking, More Siloed Networks

- Telemetry from 50,000 Microsoft employees shows WFH caused them to build and maintain fewer relationships outside of their own business group.
- And more time with their pre-existing networks
- Doubling down on bonding, not bridging, to stay productive



# Remote Work Creates More Siloed Organisations

- Little chance to build networks, lack of awareness of people outside your team
- Immediate consequences for new joiners, early career workers especially
- Long term consequences might be much more serious: social and creative capital erosion
- **Result** was an increased emphasis on social online events, better onboarding, and more emphasis on new employees.



## Collaborative Interaction

Meetings were challenging and fatiguing

# Key Findings: Meetings were Challenging

## Fatigue (Bailenson):

- Excessive eye contact
- Self-view is cognitively demanding
- Being tied to one place
- Cognitive load

Trouble sharing artifacts

Stilted, awkward conversations

*"Of all the crimes of Zoom [...] much the worst is its **chilling effect on interruption**. To cut across someone is to risk that **grim dance of confusion** in which both parties talk simultaneously."*

Janan Ganesh, FT

# How are in-person and video meetings different?

30+ years of research

- Audio issues
- Reading the room
- Lack of reciprocity

Sources: Sellen, 1992; Jefferson



# Distortions in audio

Good audio cited as number one requirement for a good video call

Lag is problematic for turn-taking

But half duplex and noise cancelling prevents rapid fire engagement

But *even with full duplex audio and no perceptible lag*, conversations are still stilted and formal





# “Reading the room” was more difficult

**In-person**, perception is multimodal and spatial, picked up in the periphery of attention

**In video calls**, cues about people’s activities and intentions are restricted and watered down



# The Breakdown of Reciprocal Perception

**In-person meetings** have "*reciprocity*":  
If I can see you, you can see me. If I  
can hear you, you can hear me.

And a shared frame of reference, so  
gestures are meaningful

**Remote meetings** make us *have to*  
*think* about how we are perceived.  
A fractionated frame of reference



# Engaging, Inclusive Collaboration is a Design Challenge

- Better work practices can help
- Better configurations can help
- But there is huge opportunity to design new collaborative tools going forward
- **Result** was new guidelines for running remote (and now hybrid) meetings. New collaborations with Teams.

**Where We Are Now**



# A Hybrid Future?

A mix of office-based and remote work

But lots of implications flow from this...

- Temporality
- Home/work boundaries
- Ecosystems
- Meeting interaction
- Sociality



# Productivity and Well Being: The Good

More focus on mental health

The right to a larger life

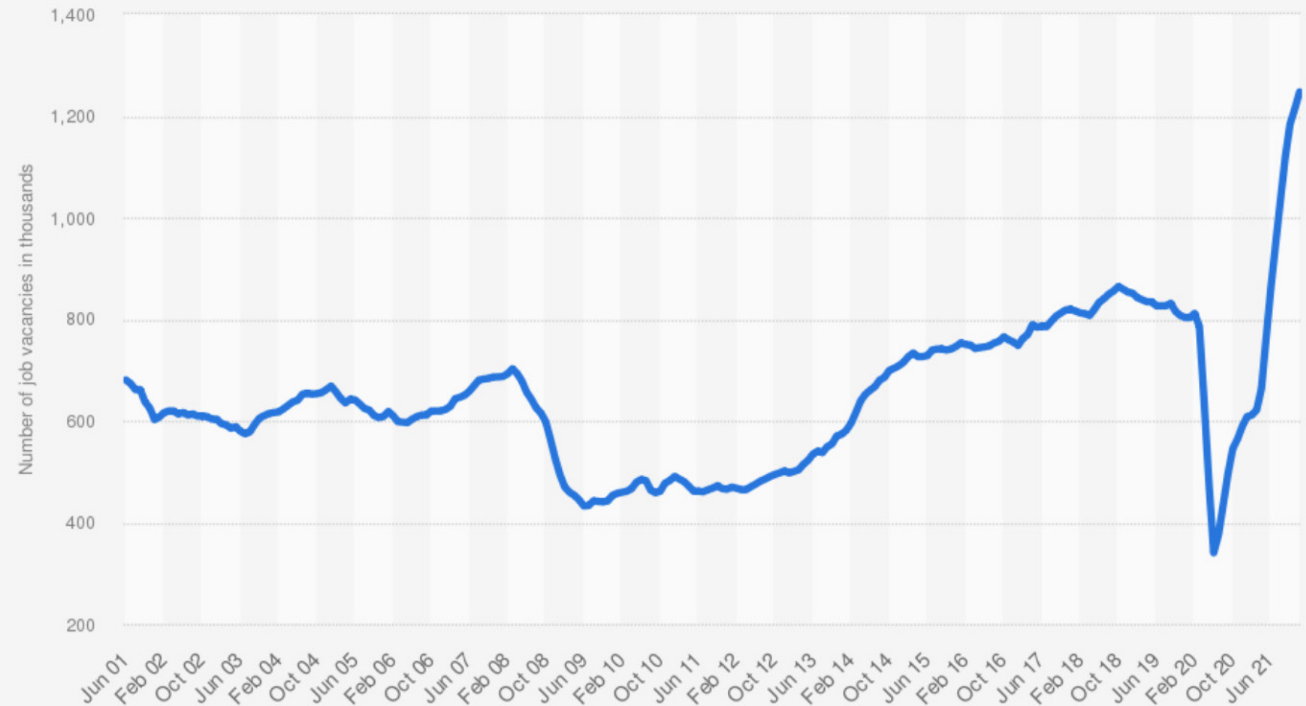
Re-assessing and reflecting on  
*why* we work



# Productivity and Well Being: The Challenging

## The Great Re-shuffle

Number of job vacancies in the United Kingdom from June 2001 to December 2021 (in 1,000s)



Source  
Office for National Statistics (UK)  
© Statista 2022

Additional Information:  
United Kingdom; Office for National Statistics (UK); June 2001 December 2021

[What is the Great Reshuffle and how is it affecting jobs?](#)

# Productivity and Well Being: How HCI Research is Helping

- Using research to generate **guidelines** for new working practices and culture
- Moving us on from productivity: Finding **new metrics** and a **new vocabulary** for meaningful, valuable work
- **Inventing new technologies** which account for more flexible, dynamic, and porous home-work boundaries



# Social Connection: The Good

Our friends and colleagues  
kept us going

Level playing field and more  
empathy

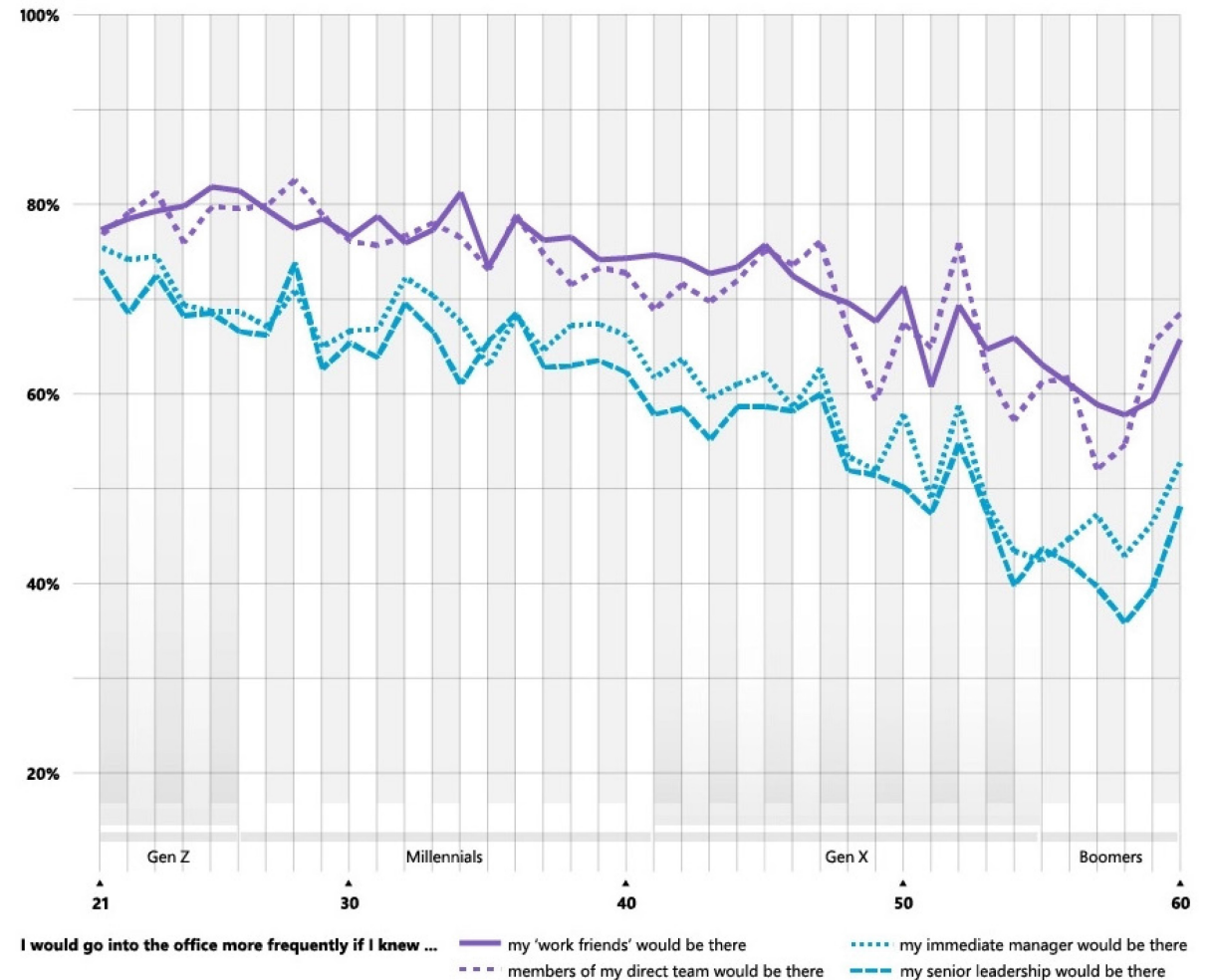
Elevated the importance of  
place



# Social Connection: The Challenging

The need to build our social  
and creative capital

How do we get people back to  
the office?



# Social Connection: How HCI Research is Helping

- Developing new practices for hybrid work
- Experimenting with new work policies
- Inventing new technologies for serendipitous and spontaneous connection



# Collaborative Interaction: The Good

We have all been "left out"

Recognition of the need for  
inclusive tech and work  
practices





# Collaborative Interaction: The Challenging

Our technologies are not  
designed for the hybrid world

Asymmetries will be amplified



# Collaborative Interaction: How HCI Research is Helping

- Developing new practices for hybrid meetings
- Reconfiguring and redesigning meeting rooms
- Inventing new technologies for hybrid meetings which are more inclusive of the remote participant



# "Perspectives" Research Prototype



# HCI's Role in the Future of Work

# HCI's Role in the Future of Work

Design new technologies and work practices for a changing work landscape





# HCI's Role in the Future of Work

Understand how the nature of work is changing





# HCI's Role in the Future of Work

Expand our view of work and workers



# HCI's Role in the Future of Work

Redefine our aspirations for work and its place in our lives

In addition to economic security (where work allows us all to participate equally in society), what about:

- **Wellbeing:** work that does not harm our health
- **Growth:** work that grows and develops our capabilities
- **Freedom:** work that provides the freedom to pursue a larger life
- **Nurture:** work that nurtures our identity and is meaningful





# Fin