

# The Four Phases of Pervasive Computing: From Vision-inspired to Societal-Challenged

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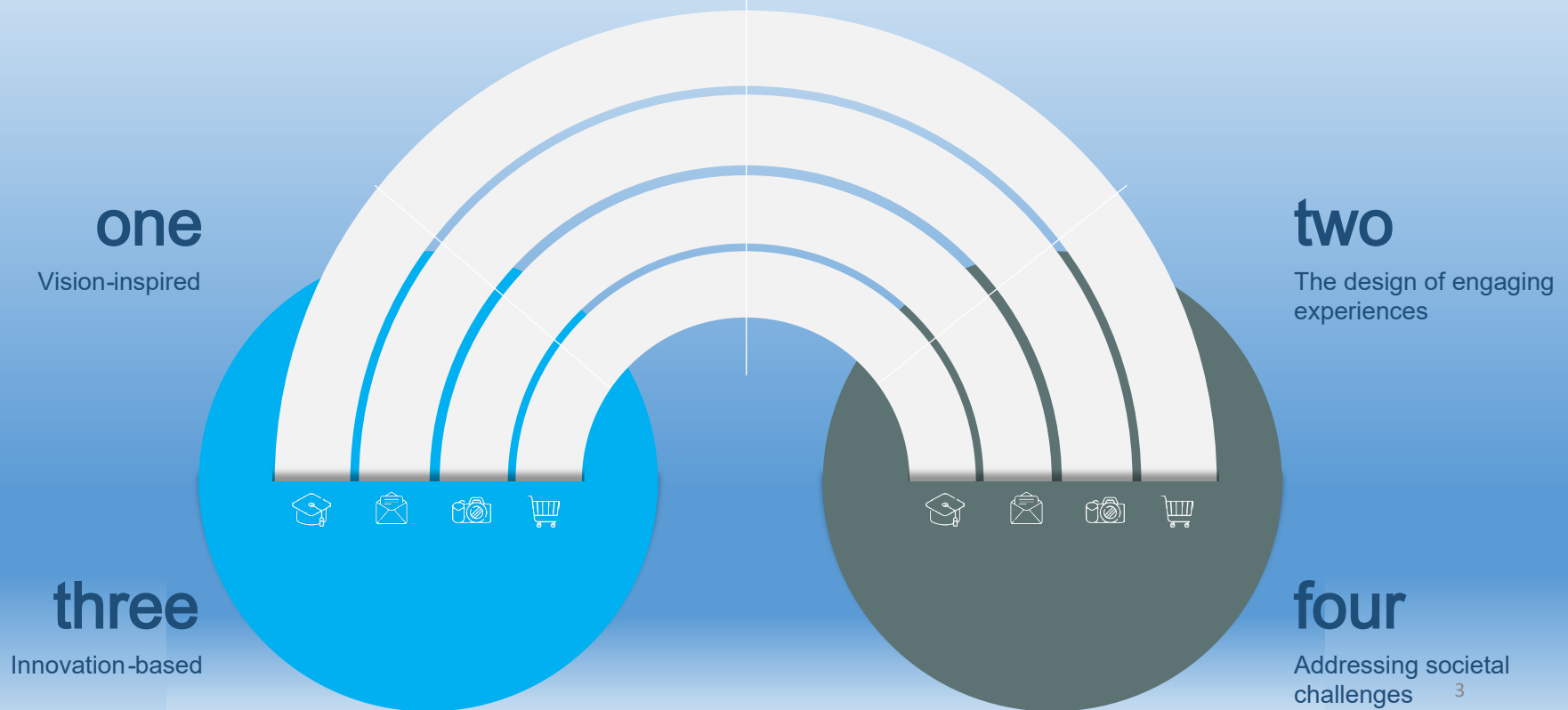
# Content

1. Introduction
2. The beginning: Weiser's Vision-led Ubiquitous computing
3. Engaging UbiComp Experiences
4. Innovation-based Pervasive Computing
5. Challenge-led Pervasive Computing
6. Conclusions

# INFOGRAPHICS

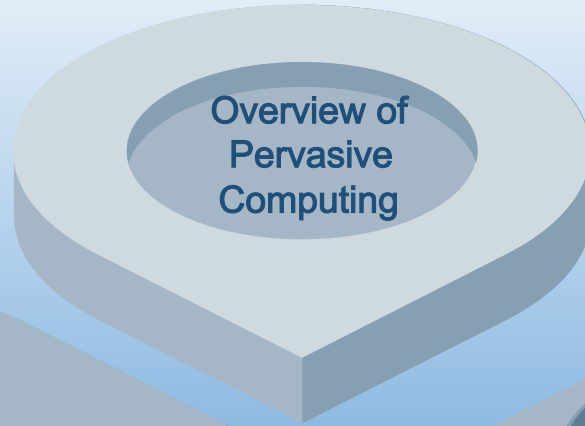
reflects on the visions and motivations underlying Pervasive Computing and  
made ending with considering future directions for the field. It describes these in  
terms of four phases

advances

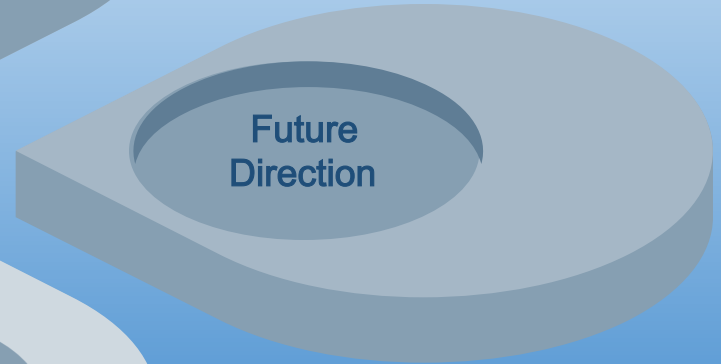
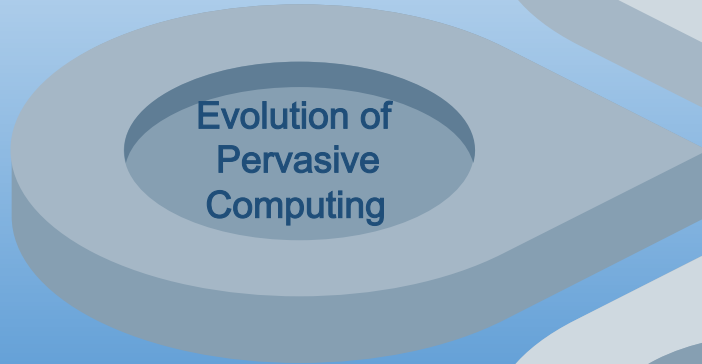


# 1 Introduction

- Pervasive Computing in comparison to other emerging computer science fields (e.g., cybersecurity, quantum computing)



- Addressing societal needs, such as global warming, through sustainable and ethically accountable computing.



- Weiser's dream of seamless integration of computers into daily life.



- Increasing dominance of technology innovation, market forces, and enterprise.



02

The beginning:  
Weiser's Vision-led  
Ubiquitous  
computing

# The Vision of Ubiquitous Computing (1990s - Early 2000s)



Weiser's insights inspired a paradigm shift, moving away from traditional desktop computing.



Two pivotal quotes guided the era: "Profound technologies disappear" and "Machines fit the human environment."



Global research zealously pursued context-aware content and the development of cutting-edge systems and mobile devices.



# Rethinking Ubiquitous Computing

01



## Unquestioned Assumptions :

**Weiser's vision** assumed technology would simplify and calm our lives. However, a growing sentiment challenges this passive relationship, calling for a more balanced dynamic.

02



## Call for Change:

Urgent calls resonate for a fundamental reevaluation of **UbiComp's objectives**.

The focus should shift towards human augmentation and practical, meaningful impacts.

03



## Critiques and Failures:

Critics argue that **UbiComp** has veered off Weiser's path, with limited tangible progress.

Ongoing reflections emphasize the importance of avoiding flashy technologies without practical value and a renewed emphasis on solving real-world problems.



03

# Engaging Ubicomp Experiences



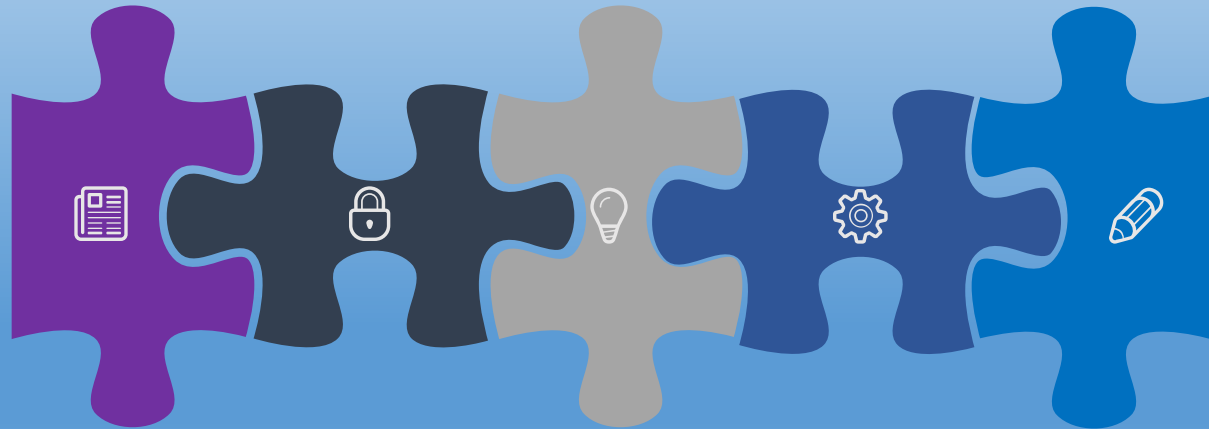


# Recap and Evolution of UbiComp (Ubiquitous Computing)

Original vision by Weiser:  
Computers as tools to  
extend and engage people in  
activities.

Positive reception and  
influence on reimagining  
possibilities for pervasive  
computing.

Shift towards engaging with the  
everydayness of life and  
experimenting with disruptive  
technologies.



Critique of "calm computing" and  
the call for visible, playful, and  
proactive computers.

Emphasis on making ubiquitous computing  
exciting, provocative, stimulating, visible,  
engaging, and even uncomfortable.

# Shaping the Field with Research Programs

Two influential research programs: Equator (UK) and MobileLife (Sweden).



Novel applications, including wearable biosensors, animal interaction, and bodily engagement.

Equator's mission:  
Synthesizing physical and digital spaces to improve life quality.

MobileLife's emphasis on happiness, playfulness, and creativity in everyday lives.

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04

# Innovation-based Pervasive Computing



# Exploring the Impact of Technological Advancements on Society



Introduction to the third phase of pervasive computing (circa 2010)

The rise of IoT and its applications in monitoring, tracking, and citizen science



Emphasis on innovation-driven developments

Key commercial milestones: smartphone adoption, wireless internet, IoT emergence

Pervasiveness of smartphones as transformative tools



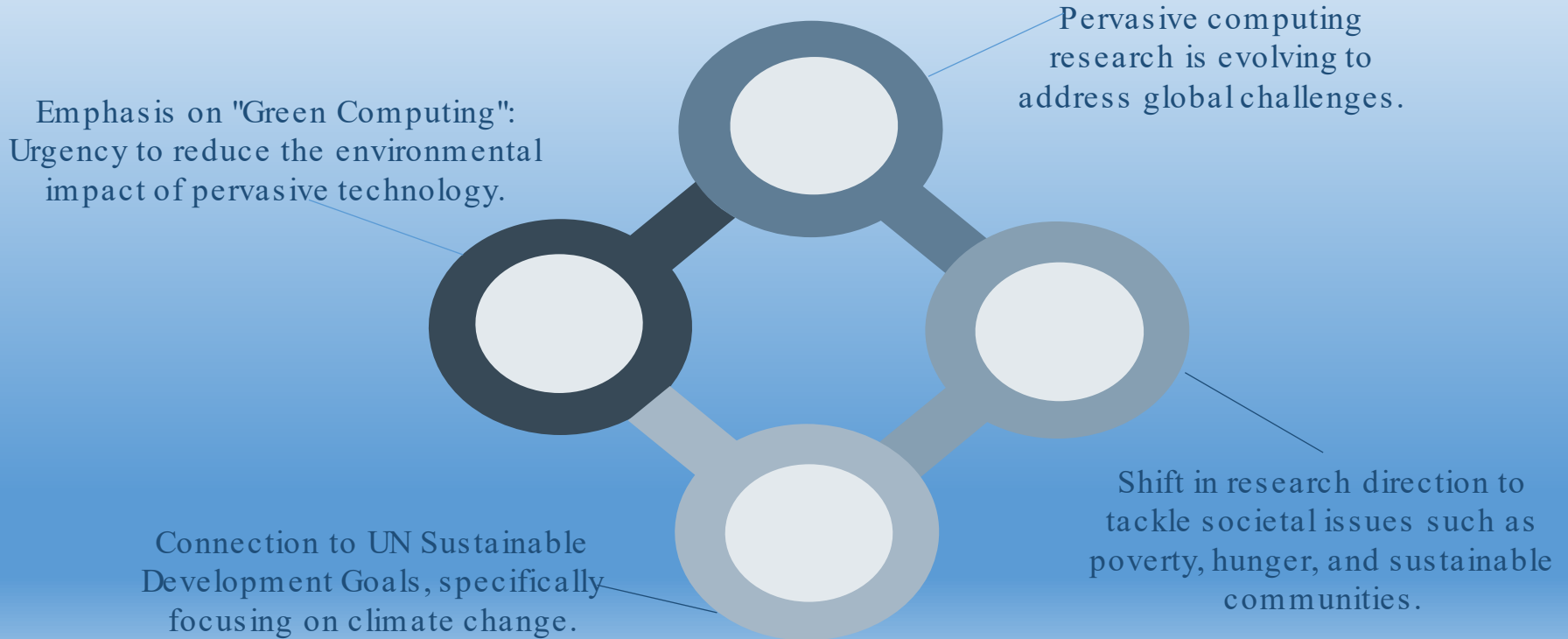


05

# Challenge-led Pervasive Computing



# Challenge-led Pervasive Computing



# *Engaging Communities in Research*

Community-oriented approach:

Involvement of communities in addressing local challenges.

Example:

Bristol project tackling damp homes through a 3D-printed IoT device.

Challenges in integrating technology:

Balancing technological solutions with community preferences.

Questioning traditional academic validation methods:

A need for a more community-driven research approach.



# *Ethical Considerations for Future Technologies*



- *Growing ethical concerns:* Increasing personal data collection in areas like home healthcare.
- *Case study:* Smartphone self-examination apps and camera capsules for health monitoring.
- *Trade-off:* Balancing personal information provided with the need for accurate device functionality.
- *Call for ethical research:* Addressing moral dilemmas, ensuring data security, and presenting health data in a reassuring and informative manner.

# *Conclusion*

Development of ubiquitous tech focused on convenience  
Future brings affordable, empowering sensors and devices  
Trustworthiness requires addressing new ethical concerns  
Shift towards bottom-up, community-oriented research  
Emphasis on societal challenges and accountability

**Thank you,  
for your  
attention**