

Social Issues that Ubiquitous Computing brings

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Outline

- What is Ubiquitous Computing?
- Rethink Individual Behavior
- Challenges to Team Behavior
- Reassess Behavior of Organizations
- Redefinition of the key aspects of the business-customer relationship
- Conclusion

What is Ubiquitous Computing

Ubiquitous computing is the method of enhancing computer use by making many computers available throughout the physical environment, but making them effectively *invisible* to the user

– *Mark Weiser*

Ubiquitous computing, or calm technology, is a paradigm shift where technology becomes virtually *invisible* in our lives.

– *Marcia Riley*
(Georgia Institute of Technology, Atlanta.)

Rethink Individual Behavior

1st example:

- The Pied Piper of Concourse C
 - **Once:** Fixed positions of computers, furniture; personnel at the check-in counters.
 - **Now:** Wireless computers; personnel roaming freely throughout the concourse to check in passengers.
 - **Consequence:**
 - Passengers who don't understand how to behave try to follow the only norm they knew for that context.
 - mobile queues snaking through Concourse C.

Rethink Individual Behavior

2nd example:

- Supervisory activity on Employees
 - **Once:** evaluation of behaviors and appearance; watched through glass office walls.
 - **Now:** evaluation of work output including end results and intermediate activities; digital representation of performance evaluation.
 - **Consequence:**
 - The value of employees' contributions might be obscured
 - Roaming employees may receive little guidance to necessary skills learning, or development on organizational commitment.

Rethink Individual Behavior

Challenges & Research Issues:

- What prevailing social norms are challenged by the advent of ubiquitous computing?
- How can employees be supervised in technology-rich, mobile working environment?
- How are definitions of action and work redefined by ubiquitous computing?

Challenges to Team Behavior

Study of a virtual teamwork on rocket design

- The team used a dedicated "Notebook" technology to coordinate and insisted logging the all voice communications into the discussion database.
- Data entry was laborious; Members couldn't express the complex rationales underlying design recommendations.
- Regularly scheduled telephone conferences were introduced to add verbal communication, which facilitate the successful design task.
- Team behaviors in ubiquitous computing environment might reveal contradictory mixtures of old and new practice.

Challenges to Team Behavior

Challenges & Research Issues:

- How do work teams adopt and adapt ubiquitous computing technology?
- How can virtual teams be most effective?
- How are social interactions redefined by ubiquitous computing?

Reassess Behavior of Organizations

- Virtual Organizations
 - Virtual corporations without material basis. E.g. the "paper" corporations formed at Enron Corporation.
 - Virtual companies that merely coordinate the activities of other firms.
- Virtual Nonexistence
 - Spatial boundaries: the home laying outside workplaces → everywhere; many households becoming primary workplaces
 - Temporal boundaries: the 40-hour, five-day workweek → anytime

Reassess Behavior of Organizations

Challenges & Research Issues:

- What new organizational forms can be realized with ubiquitous computing?
- How can reasonable and effective social boundaries be created and maintained in technology-rich environment?
- How are organizations redefined by ubiquitous computing?

Redefinition of the key aspects of the business-customer relationship

- A business-customer relationship involves awareness, accessibility and responsiveness.
- Current CRM applications: just focus on identifying and targeting the right customers.
- Emerging technologies associated with ubiquitous computing such as mobile phones, wireless PDAs, instant messaging, video conferencing, and kiosks will expand and alter today's CRM functionality.
- New ways of achieving awareness, new channels for accessibility, and new techniques for responding.

Redefinition of the key aspects of the business-customer relationship

- Two examples:
 - Online Medicine Cabinet
 - Mobile Valet
- Ubiquitous computing:
 - Enables the three characteristics (awareness, access, and responsiveness) of a relationship.
 - Transforms some key characteristics of customer interaction: the role of their location, the scope, duration and frequency of the services.

Redefinition of the key aspects of the business-customer relationship

Role of customers' location

- Often location is a critical indicator of the user's task and a implication of available resources there.
- Online world and physical world should not be viewed as adversarial.
- Deliberate choice of the physical presence of services is competitively necessary, must consider critical elements like awareness, access, and responsiveness.

Redefinition of the key aspects of the business-customer relationship

Scope of the services

- The remote service providers' constraints (remote, have no staff at the location) limit the nature of the service they can deliver → collaborate with the local staff, and provide a better service in both interests.
- Personal service provider
 - Customer service is dissociated from a particular location.
- Privacy concerns:
 - Privacy management services
 - Business should think carefully about the collection, share and use of customers' privacy
 - Combination of technology, legislation, and business policies.

Redefinition of the key aspects of the business-customer relationship

Duration and frequency of the services

- Service providers must pay continuous attention to their customers
 - Are companies ready to offer this level of customer attention today?
- Service providers will have to be very selective and precise in their interactions with their customers
 - relationship between service providers and customers: a few long, intense interactions (checkups) → frequent, brief interactions ("microservices").

Conclusion

Changes brought by ubiquitous computing:

- Innovative forms of social actions
- Novel organizational forms
- New business models – ubiquitous commerce

Challenges to social scientists:

- Exploit and modify existing social theory to explain individual behavior
- Study teams as they actually behave, not as they are designed to function
- Make theory relevant to organizations as they exist now and in the future, not as they existed years ago
- Redefine the key aspects of business-customer relationship

Thanks for attendance!

Questions?