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Mobility

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Learning Outcomes

- After attending this lecture and reading the additional literature, you should be able to:
 - Understand what type of problems can arise when you include mobile workers in a team
 - Understand the unpredictability associated with mobile ICT
 - Give examples of mobile devices and groupware supporting mobile collaboration

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Mobile workers

- The mobile worker can be defined by having a 'place of work' that is not fixed
 - They have to be able to work effectively in a range of different work settings and contexts
 - For some workers mobility is central to their role – e.g., field service engineers
 - They are also known as Nomads

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Gap Hypothesis

- Lack of
 - Communication
 - contact and teamness
 - Up-to-date information
 - Knowledge sharing

Performance

High
Low

Less
More

Use of Mobile Technology

Central workers
Mobile workers

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Devices

- Personal Mobile
 - Two-way pagers
 - Mobile phones
 - Talk/SMS/MMS/Video
 - Wireless PDAs
 - Mobile Web Browsing
 - Offline
 - Online
 - Laptop
 - In-car
- Public Static
 - Internet Café
 - Email & Broadband Internet 'Phoneboxes'
 - Can be used to access private space
 - Large public displays
 - Cannot be used to access private space

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Examples

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Mobile computing

- Exploits the advanced technologies of
 - Wireless communication and networking
 - GSM, GPRS, UMTS, 802.11, Bluetooth
 - Internet
 - GPS
- Provide anytime, anywhere access


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Loss of Predictability

- Device capabilities
 - Small low-resolution monochrome screens
 - Limited processing power
 - Limited battery life
 - Clumsy input mechanisms
- Network conditions
 - Low-bandwidth variable connectivity
 - Unpredictable connections that may break up frequently

- Context
 - Location
 - Environmental conditions
 - Attention



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Dealing with unpredictability

- Device capabilities
 - Service discovery (Bluetooth)
 - Device aware services
 - Content selection/transformation (HTML to WML)
 - Modality selection (Text to Voice)
- Network conditions
 - Anticipating information needs
 - Server emulation
 - Backup
 - Synchronisation
- Context
 - GPS, sensor technology
 - Zone markers

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Mobile awareness

- Extend the benefits of awareness information to mobile users
 - E.g., Mobile IM (IBM Sametime Everywhere)
- Provide information about unpredictable factors
 - Presence: Which device should a person be contacted on?
 - E.g., desktop or mobile phone
 - Context: Which mode of communication will be most effective and suitable for the circumstances?
 - E.g., voice or text
 - Location: Is the person in a location in which this message makes sense? (GPS + meta data?)

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Space-Time Matrix

	SAME TIME	DIFFERENT TIME
SAME PLACE	 Whiteboards, projectors Recording devices	 Messages, documents Shared data stores
DIFFERENT PLACE	 Telephone Videoconferencing Shared workspaces	 Mail Shared data stores

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Extended Matrix

		TIME	
		Same time	Different time
SPACE	Same place/fixed		
	Same place/mobile	RoamWare	Footsteps/Digital Graffiti
	Different place/fixed		
	Different place/mobile	Mobile chat; SMS, MMS etc. (IBM mobile IM)	WAP mail

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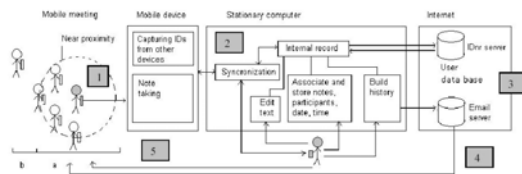
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Group exercise

- In small groups, think about how you can design a system to exploit the mobility of students on campus
 - Information access
 - Sociability support
 - Communication

RoamWare



Digital Footprints

- Aka Digital Graffiti
- Uses GPS (although location information can be provided by other means)
- Attaches location information to media objects available on the Web
- Objects can be retrieved when in the right location using a GPS enabled multimedia phone



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Accessibility


- How do provide access in unpredictable circumstances?
 - Input/Output redundancy
 - System standards
 - Compatible devices

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Further Reading

- Wiberg and Gronlund – Exploring mobile CSCW
- Wiberg – RoamWare
 - Both available via links on the module's Web page



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