Teaching Mobile Computing

Zakaria Maamar
College of Information Technology
Zayed University, Dubai, U.A.E

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Reference

- M-Government, Mobile Technologies for Responsive and Connected Societies, OECD and ITU technical report, 2011
  - OECD: Organization for Economic Co-operation and Development
  - ITU: International Telecommunication Union
    - In collaboration with the United Nations Department of Economic and Social Affairs (DESA)

Some facts…

- 90% of the world population and 80% of the population in rural areas have access to mobile (wireless) networks

- ``Mobile cellular has been the most rapidly adopted technology in history. Today it is the most popular and widespread personal technology on the planet, with an estimated 4.6 billion subscriptions globally by the end of 2009''

Background

- Mobile computing promotes the use technology while on the move
  - Ability to compute, communicate, and collaborate anywhere, anytime
- Pervasive (or ubiquitous) computing refers to information processing being thoroughly integrated into everyday objects (e.g., TVs and Fridges, aka Internet of Things) and activities

- ``The most profound technologies are those that disappear. They weave themselves into the fabric of everyday life until they are indistinguishable from it''
  - Mark Weiser, The Computer for the 21st Century, Newsletter ACM SIGMOBILE Mobile Computing and Communications Review, 3(3), July 1999

- Mobile and wireless technologies affect how organizations operate and deliver services
  - E.g., from e-government to m-government
  - Made possible because of mobile devices' lower costs and ease of use
  - By end of 2010, 5.3 billion mobile cellular phone subscribers, including 940 million subscriptions to 3G services.

From e- to m-applications

- The switch from e- to m- isn't a series of single initiatives, rather, it should be designed as part of the overall e-development strategy
  - Most of the time m-applications complement e-applications (don't substitute)
  - Not all applications can run on mobile devices not should they
  - Not all wireless connections are cost competitive compared to wired connection

- Key players and stakeholders (forming the ecosystem)
  - Government (itself) as regulatory authority
  - Telecom operators as enabler and investment source
  - End users (citizens, businesses, and government employees) as drivers
  - Others: device makers, infrastructure providers, and application and/or content developers.

Factors motivating m-applications

- Better service accessibility, availability, responsiveness, and quality and efficiency
- Service scalability
- Integration, communication, and interaction
- Reduced cost (fixed and operational)
- Better image and perception

Obstacles to m-applications

- Infrastructure development in terms of bandwidth, reliability, etc.
- Legal issues in terms of privacy, security, confidentiality, etc.
- Accessibility
- Cost
- Platform diversity

Mobile computing course

- **Offered first time in Fall'2011 in Dubai**
  - Core course in the enterprise computing specialization
  - In partnership with SAP Alliance Program and BB Academic Program

  - **Details:**
    - **Course Number/Title:** CIT 371/Mobile Computing
    - **Credit Points:** 3
    - **Contact Hours:** Lecture: 3, Lab: 0, Other: 0
    - **Grading Mode:** Normal (A-F)
    - **Prerequisite(s):** CIT-255

Description

- One of the driving forces behind current developments in computing is to explore the vision of ubiquitous computing. That is the desire to be able to work and communicate anytime and anywhere and integrate leading-edge mobile computing devices into people's daily life. This course will cover the major development platforms and the different approaches to providing mobility in computer networks. Topics include the fundamental concepts and principles of mobile computing, wireless networks, wireless sensor networks, applications and services in mobile commerce and other domains, usability and security issues that apply to the mobile environment. Students will experiment with mobile technologies, work on cutting-edge projects, and research and develop ideas for novel mobile computing applications and services. Students will learn about the wireless networks that facilitate the use of mobile devices and their operating systems, develop browser-based applications for their devices, and become conversant with wireless networks and their protocols from Bluetooth to Wi-Fi to 3G and beyond. Students will learn about the critical issues to modern mobile computing such as databases, service discovery, mobile social networks, security and privacy, and business models.

Course outcomes

- After taking CIT371, the students will (be)
  - Able to demonstrate an understanding of the fundamental concepts and principles of mobile and pervasive computing
  - Familiar with the different platforms for enabling mobility in computer networks
  - Have knowledge of critical issues to modern mobile computing such as databases, security and privacy, service discovery, mobile social networks, and business models

- Aware of the applications of mobile computing technologies in everyday lives
- Have a working hands-on knowledge of some mobile computing technologies such as smartphones, wireless sensors, and mobile applications
- Able to design and develop mobile computing applications and services
- Make choices for mobile computing technologies to be deployed in any organization
- Install and configure servers for supporting mobile users

Learning Outcomes

- **Major Learning Outcomes**
  - Critical Thinking and Qualitative Reasoning in IT **[Developing]**
  - Information Technology Application **[Developing]**
  - Information Technology Management **[Developing]**
  - Information Technology Professional Practice **[Developing]**
  - Information Technology Systems Theory and Practice **[Developing]**

- **Zayed University Learning Outcomes**
  - Information Literacy **[Accomplished]**
  - Information Technology **[Developing]**
  - Critical Thinking and Reasoning **[Developing]**
  - Global Awareness **[Developing]**
  - Leadership **[Developing]**

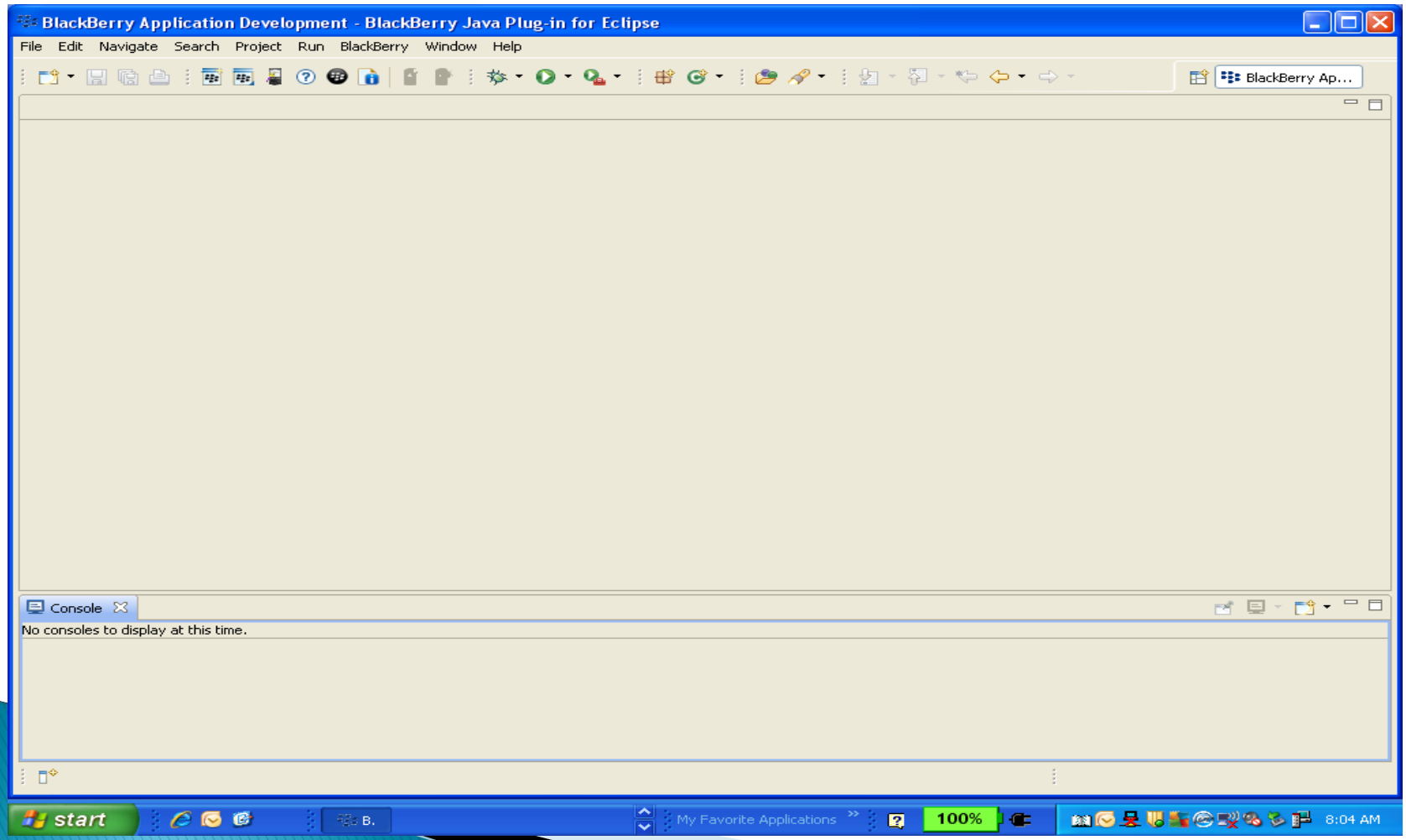
Topic coverage

- Topics

- Samples of research papers discussed in class
  - Paper1
  - Paper 2

Hands-on sessions

- BlackBerry Java Plug-in for Eclipse



- BB Tutorials
  - Writing Your First Application
  - Storing Persistent Data

Conclusion

- ``Commerce, E-Commerce, and M-Commerce: What Comes Next?'', Z. Maamar, *Communications of the ACM*, 46(12), 2003

- Paving the way for the mobile post-era by building upon social elements:
  - social commerce/government/learning (s-commerce/government/learning) …