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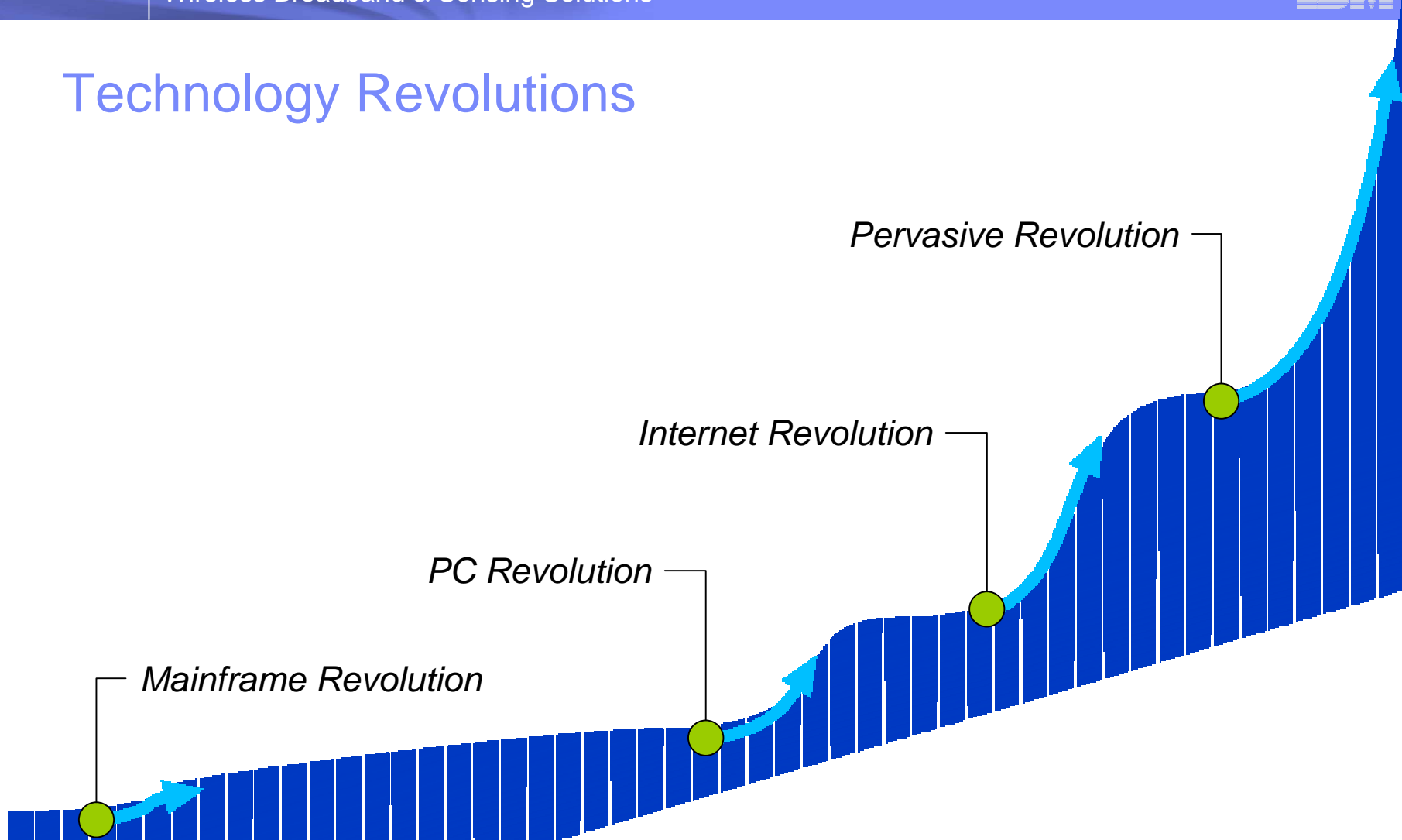
# Mobile Campus Solutions

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## Agenda

- **Technology Revolutions**
- **Campus – Yesterday**
- **Campus – Today**
- **Opportunities**
- **Challenges**
- **Roadmap and Components**
- **References**
- **Appendix**

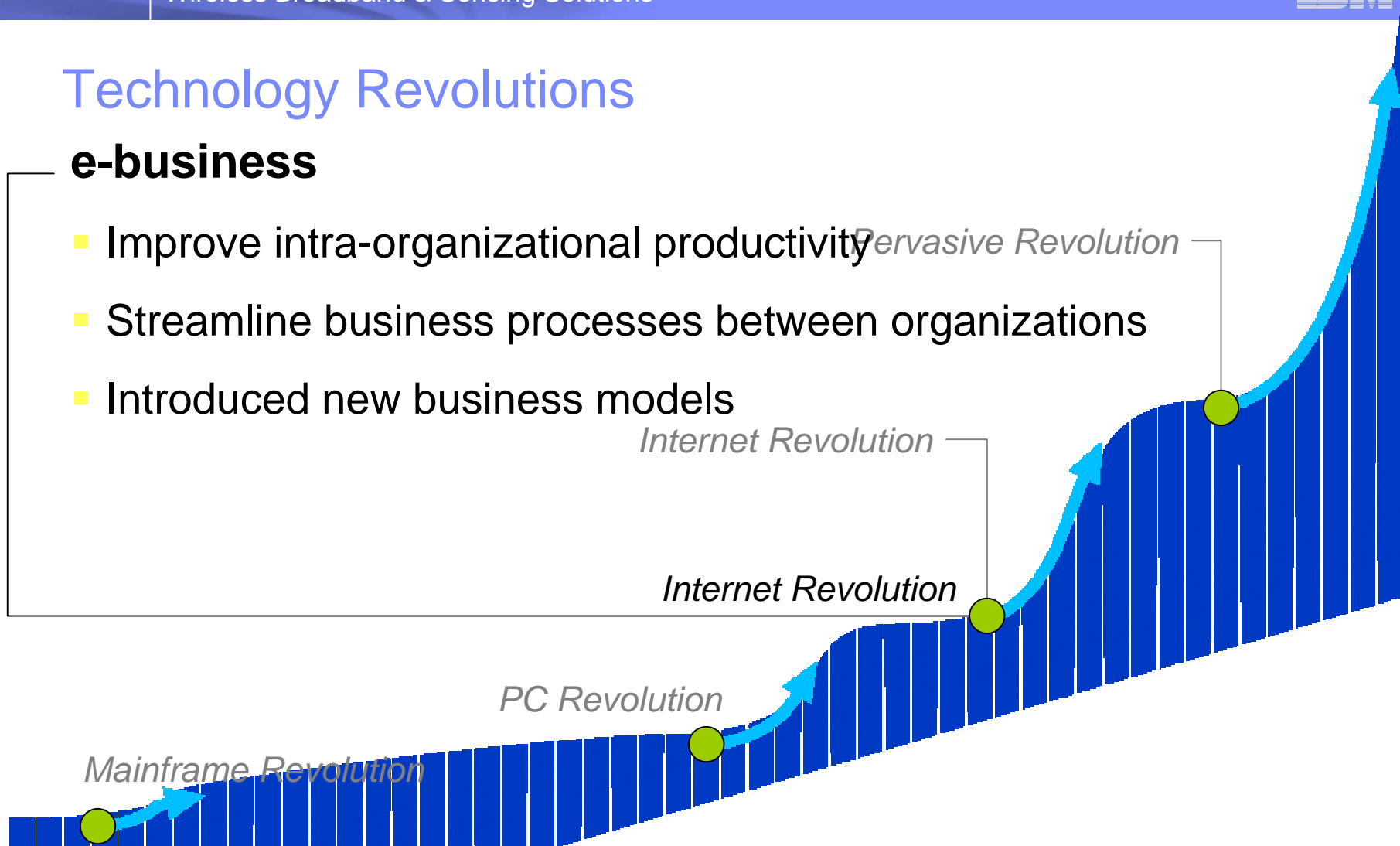
# Technology Revolutions



# Technology Revolutions

## e-business

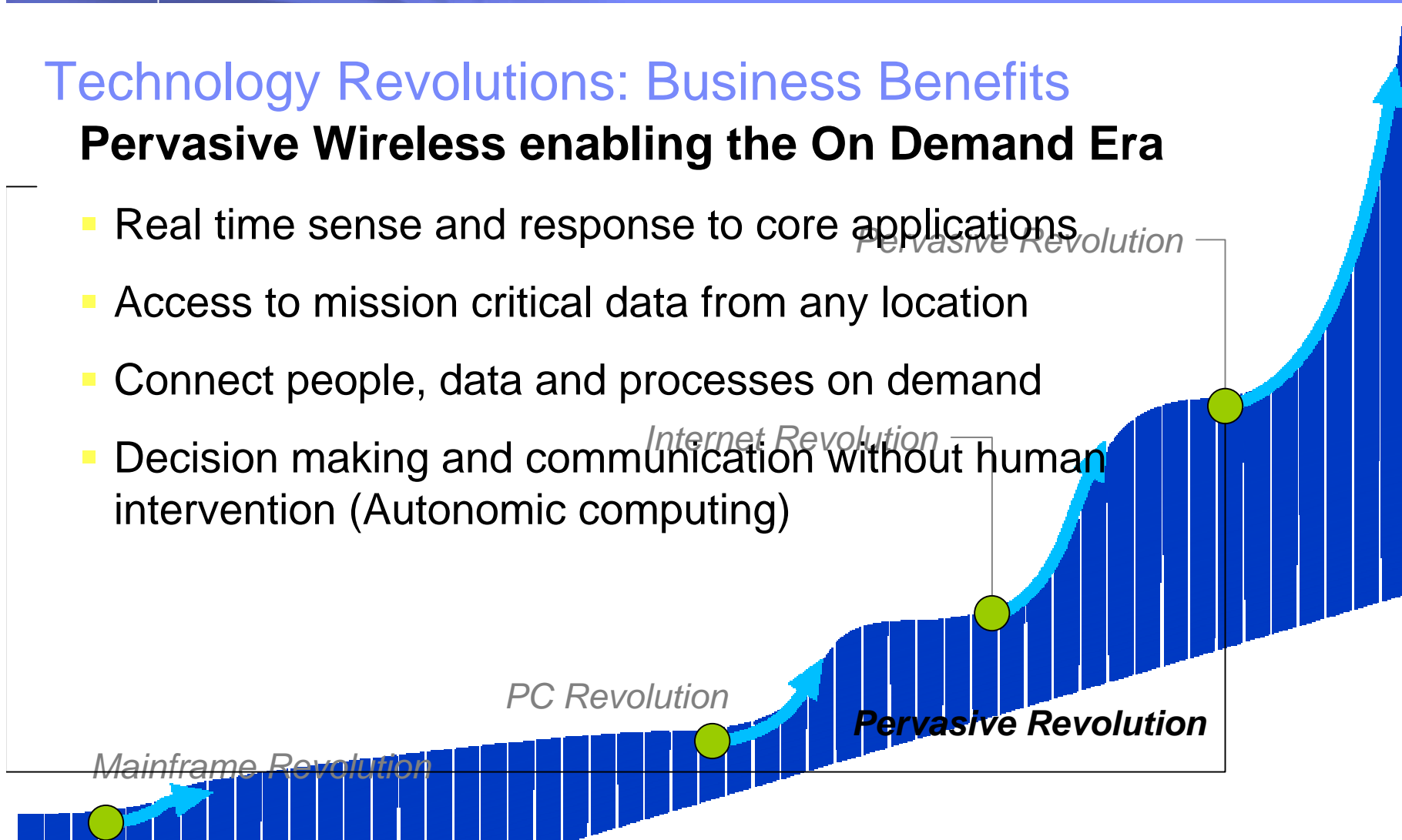
- Improve intra-organizational productivity
- Streamline business processes between organizations
- Introduced new business models



## Technology Revolutions: Business Benefits

### Pervasive Wireless enabling the On Demand Era

- Real time sense and response to core applications
- Access to mission critical data from any location
- Connect people, data and processes on demand
- Decision making and communication without human intervention (Autonomic computing)



## Pervasive Wireless Vision



The Technology

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Business Benefits



## Yesterday...*face-to-face campus culture was the norm*

- Universities have a large mix of voice and data communications networks with wired, wireless, LAN's, hotspots, etc that are unconnected and unco-ordinated across the (multiple) Campuses.
- Historically the Campus population were a “captive audience” on campus; relatively closed environment
- Trips to registrar, finance office, etc. required and accepted; students required to understand and navigate separate university organizations and processes
- Campus life supported by purchases made on campus or in town

## Today *forming a community of connected constituents.*

- The most wired, commercially attractive demographic
- Increasing majority of students come to college with cell phones
- Wireless devices are arriving at an exponential rate including Notebook PC, PDAs and Smartphones
- Increasing majority of students, faculty and alumni prefer interaction with their university via multiple devices
- New generation expects to be able to do everything – anywhere, any time and with any device
- Traditional and commercial competitors are willing to meet that expectation

## Students are savvy consumers ... today they:

- Use PDAs to stay organized and surf the Web
- Pay traffic tickets, buy books, and receive insurance quotes – using their voice or Web
- Comparison shop instantly and purchase goods and services such as travel using voice or Web – often via PDA devices or cell phone
- Get proactive notifications of flight delays on phone or pagers

*And...students expect this level of service and access to technology from every organization - including Colleges and Universities*

## Challenges of extending the network....

### Mobility Challenges

- Connectivity/disconnectivity
- Authentication & authorization
- Security
- Voice/data access
- Device management
- Scalability
- Services
  - Messaging services
  - Location awareness
  - Intelligent notification

### Device Challenges

- Unique device capabilities
- Varying programming models
- No dominant standard
- Wide range of target environments

### Application Challenges

- Content aggregation
- Customization and personalization
- Application reuse
- Multi-device capability

## and opportunities ...

- Developing new business models that will increase revenue for the institution
- Future-proofing the campus network infrastructure
- Focusing on the integration of essential public safety solutions
- Selecting the best vendor partners and alliances to assure multi-device (Internet, phone, PDA, etc.) application access
- Differentiating the college/university in a very competitive marketplace
- Improving the “braking distance” necessary to lower IT costs and quickly align IT with changes in funding and budgeting
- Increasing the value of the relationship between the institution and the surrounding community

## What are the Challenges for Universities

- What are some of the trends in Universities?
- Drivers of Change?
- Initiatives by Universities to address the trends
- What Solutions might Help address these initiatives?

## Imagine ...

*students and community having access to any university department from any device, laptop, phone or PDA – whichever they prefer*

### ▪ **Possible Scenario –**

- Students want to check the status of their financial aid application or need to be notified or alerted that their tuition fees are due.
- And extend other self-service Web apps to voice and PDA applications, such as:
  - Finance (tuition, fines, meals)
  - Financial Aid
  - Registration
  - Grades Posting
  - Athletic Events
  - Research Grants
  - Alumni Events
  - Funding Campaigns

### **New Student & Community Services**

Imagine ...

*Broadcasting information on particular events or cultural events to alumni/community through multiple media*

- **Providing easy access to reserve university facilities (i.e. banquet facilities, theater facilities, athletic facilities); potentially generate revenue.**
- **Increase exposure to alumni, local businesses, local government and make it easy for these communities to access the university for information, services, and events.**
- **Delivering these capabilities in a low cost ‘self-service’ mode while increasing community exposure and level of service.**

New Community Services

Imagine ....

**A way to build brand loyalty for the university and support local entrepreneurs who serve key student business needs**

### **Possible Scenarios**

- **Local commerce**

- A number of local businesses who transact business with your students on-campus or off- campus
- The University allows all of these entities to set up their business ‘storefront’ through the university infrastructure.
- Generate revenue from each transaction, while building BRAND loyalty for the university

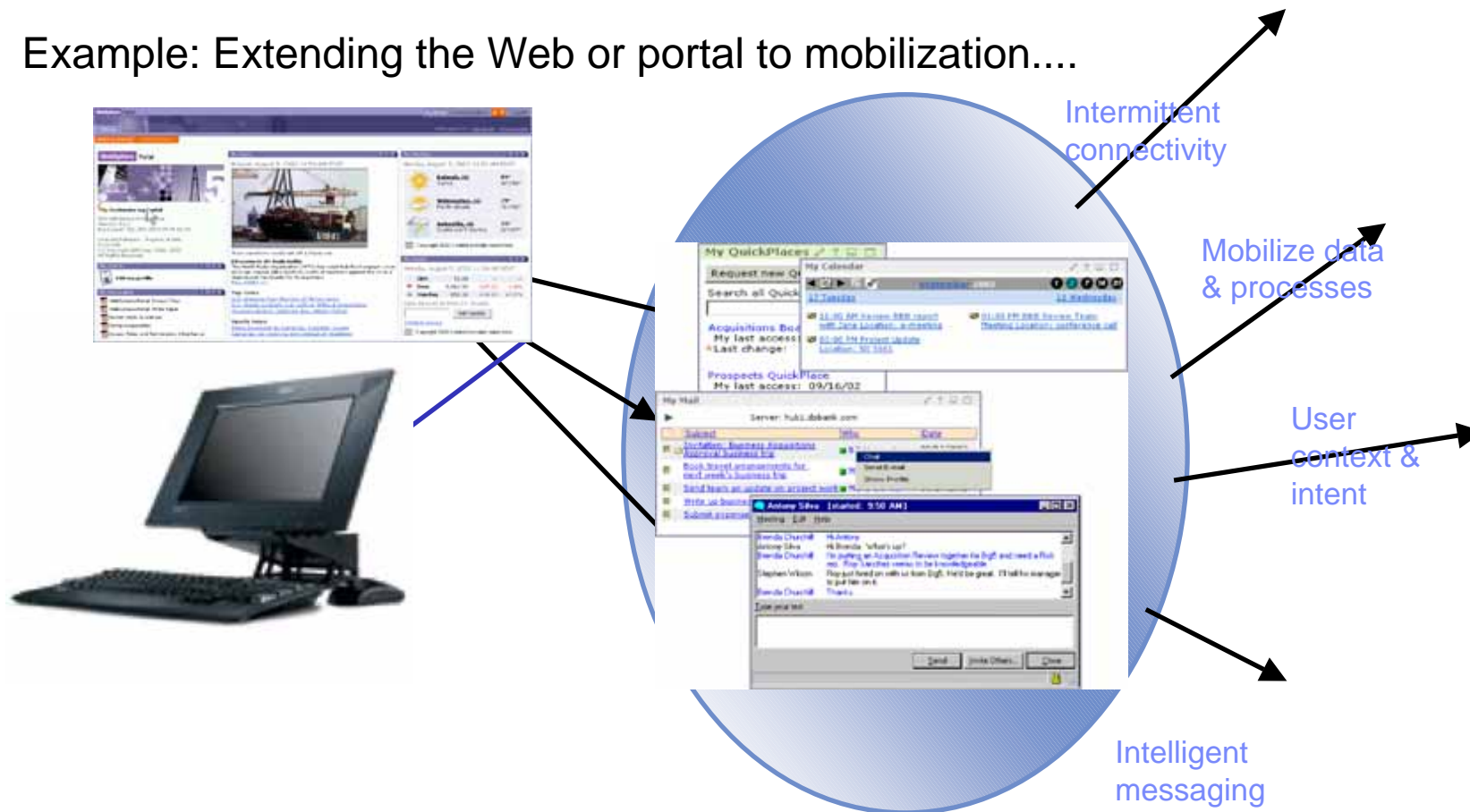
- **Holiday and full time employment Services**

- Generate facilities to interact with selected students on job offers and part time employment.
- Generate a fee for transactions.

**New Community Services**

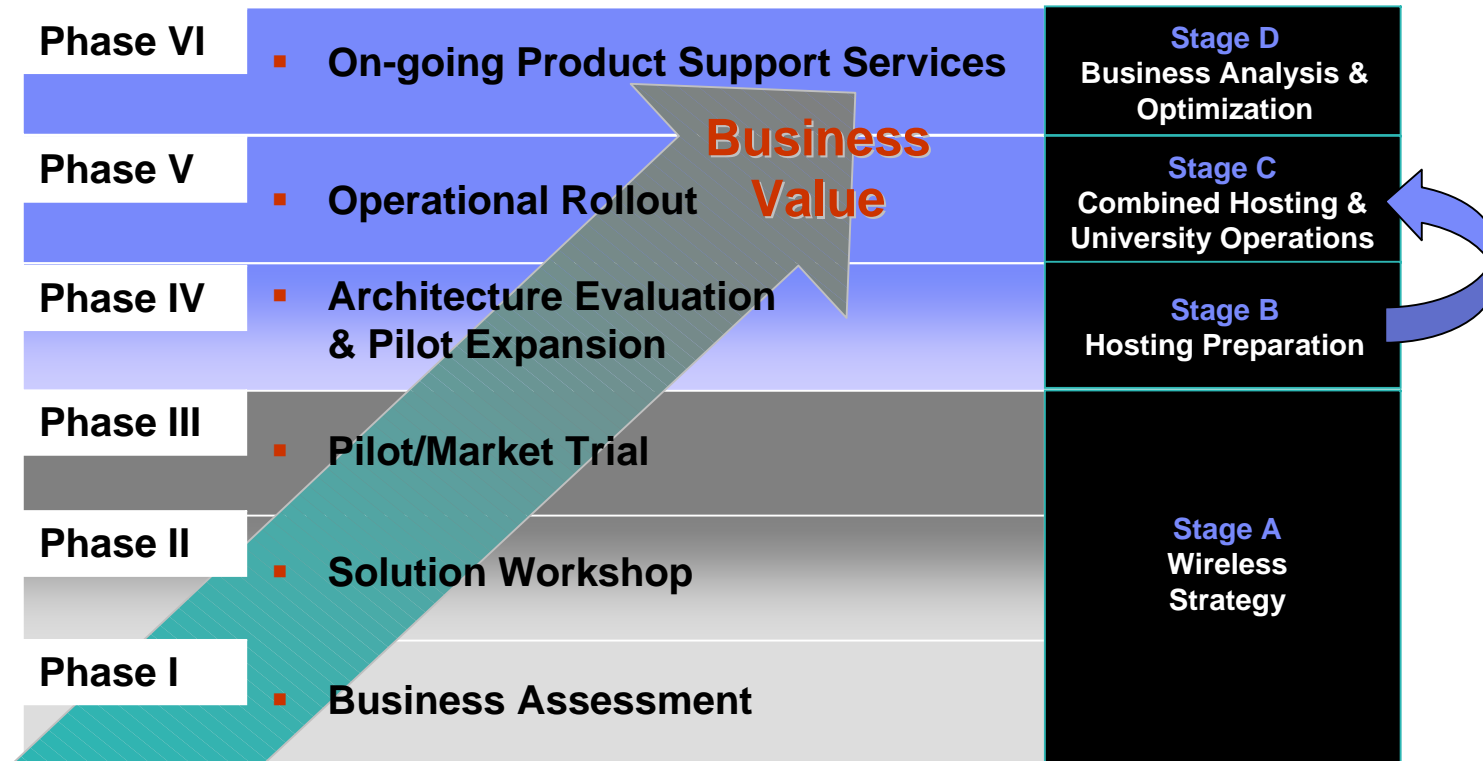
# It's about "mobilizing" existing Business Processes

Example: Extending the Web or portal to mobilization....

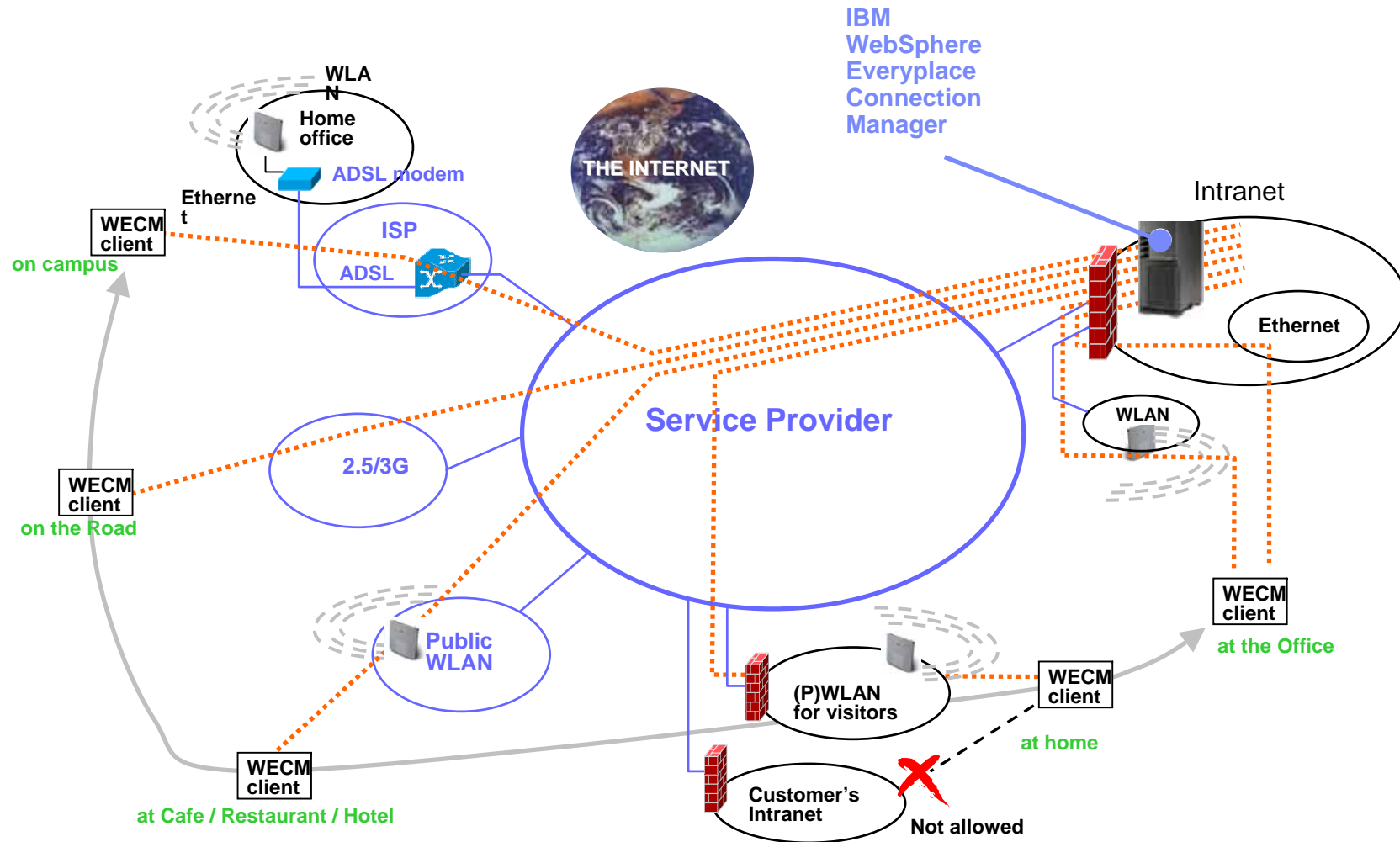


## Campus Wireless Solution Roadmap

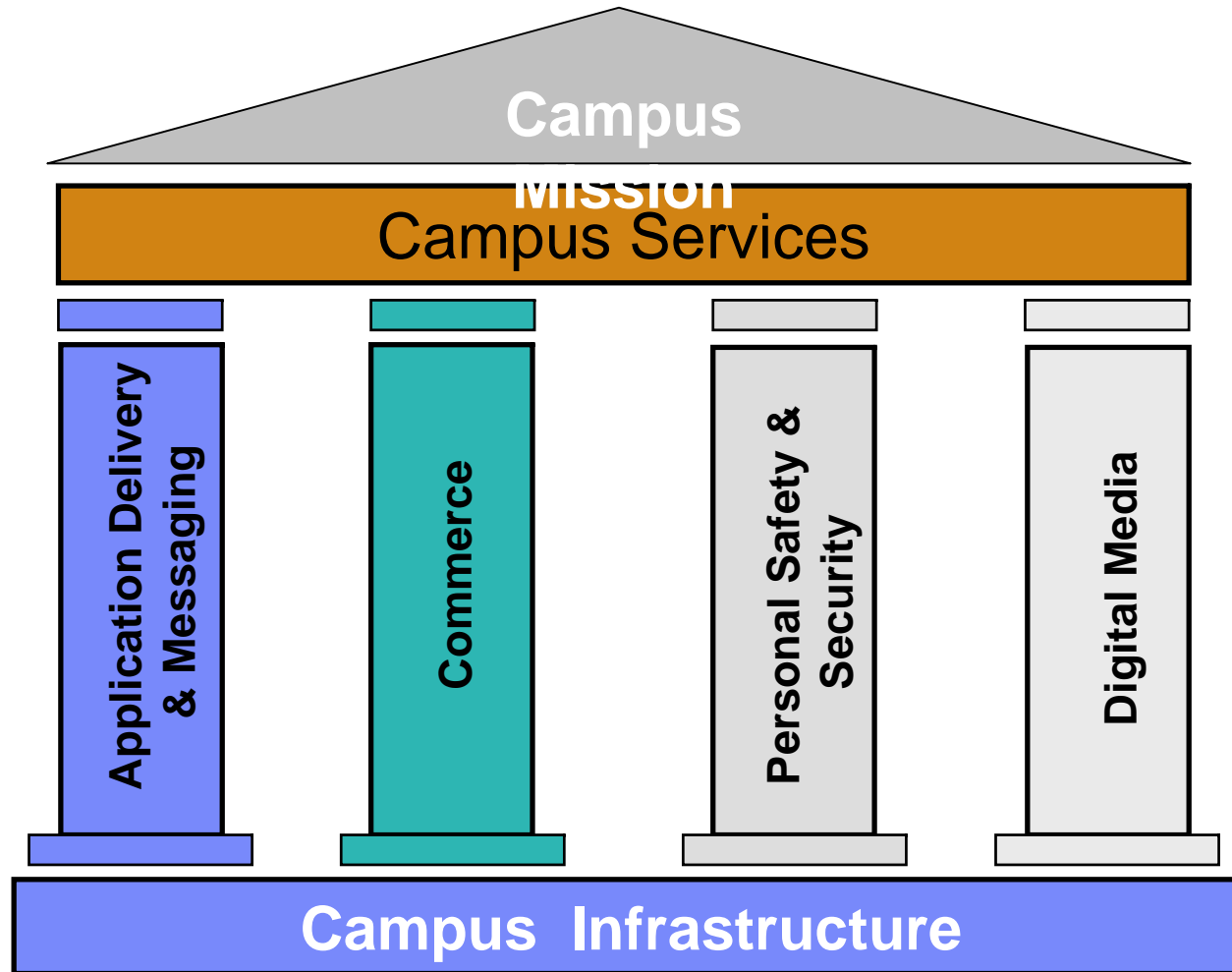
- The solution roadmap defines an iterative approach to solution development that provides business value check points to ensure the sustained business viability of the solution
- Phases can be combined to increase speed to market
- A, B, C, D are separate solution roadmaps leveraging different competencies with A linking into application solution side



# Network - seamless roaming between locations



## Enhanced Campus Communication Solution



## References – Case Study

- **Wake Forrest University**
- **University of Central Arkansas**
- **Canyon Independent School District**

# Wake Forrest University

## ▪ Profile

- Wake Forest University, located in Winston-Salem, North Carolina, has an enrollment of approximately 6,000 students in its liberal arts, graduate schools and professional programs.
- The university's goal was to extend its current wireless 802.11-standard network to address the explosive growth of cell phones, PDAs, Wi-Fi laptops and handheld devices currently in use on the Wake Forest campuses.

## ▪ Solutions and Benefits

- Expand and improve cellular coverage on campus using third-party neutral hosting. This would significantly improve cellular coverage throughout the campus while enabling a revenue-generating cellular business model.
- Leverage the local city network facilities for community broadband. This would support a revenue-generating business model for low-cost broadband to Wake Forest University and the community.
- Tie the multiple infrastructures together with a mobility-enabled framework that leverages the existing networks. The university could then create a suite of value-added services.
- Extend the university's touch with the students through the expansion of the portal capability and real-time security and safety facilities, enabling the university to deliver more personalized service offerings to its community.

# University of Central Arkansas

## ▪ Profile

- The University of Central Arkansas (UCA) is a strategic higher-education institution that focuses on bringing quality degree-oriented education to students from many countries throughout the world. As part of Arkansas's state education system, UCA's central campus, located in Conway, along with its distance learning and extension locations, serves over 8,500 students and almost 1,500 faculty and staff.

## ▪ Solutions and Benefits

- By shifting its telecommunications business model to fully embrace wireless communication, UCA can provide a wide range of new services to both students and faculty:
  - Advanced instant message applications to help students access university services from any phone, laptop or PDA.
  - Instant distribution of grades or reminders of upcoming tuition due dates.
  - Access to information about financial aid, registration, research grants or athletic events.
- The new wireless communications solution will also enable UCA to recapture the revenue it has lost to mobile technology by letting students, faculty and staff purchase wireless services from the university - and by allowing the university to make the most of its existing wired system.

## Canyon Independent School District

### ▪ Profile

- Located in the Texas Panhandle, Canyon Independent School District (CISD) is a K-12 district that spans 711 square miles - from the southern city of Canyon to the city limits of Amarillo. CISD is home to 7,500 students and more than 1,000 teachers, paraprofessionals and other auxiliary personnel.
- To be more responsive to the needs of its students and teachers, CISD had to overcome the geographic constraints of the Palo Duro Canyon. It needed technology that would allow schools to collaborate and enrich the overall learning experience without exhausting the budget.

### ▪ Solutions and Benefits

- The wireless solution successfully bridged the digital divide of the Palo Duro Canyon to allow each student and teacher access
- The network combines 655Mbps high-speed point-to-point Ceragon Networks microwave radios and antennas bridging distances of up to 13 miles in a spoke-and-hub design
- In addition to the hardware and infrastructure planning included in the wireless network solution, IBM provided CISD with IBM ThinkPad wireless laptop computers for use in the classroom.

# Thank you

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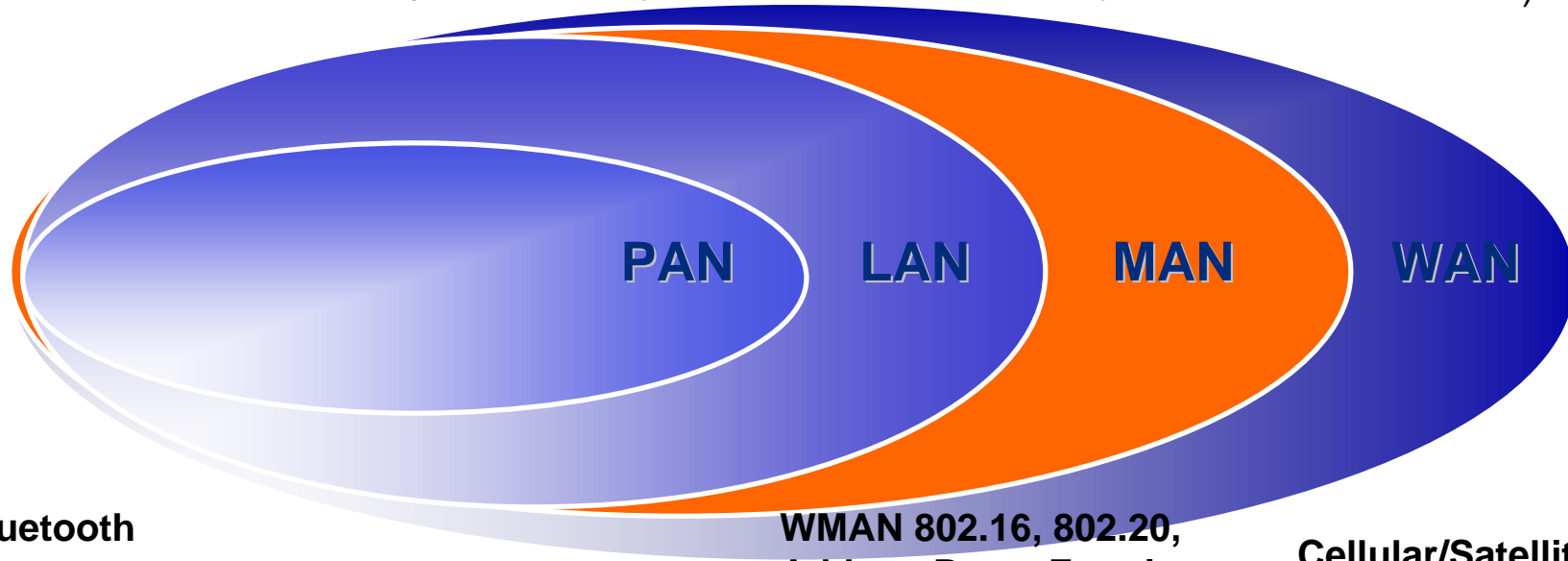
## Appendix: Network Convergence

**Personal Space**  
(Office, Briefcase,  
Person, Broadband)

**On-Campus / Public**  
(Office, SOHO,  
Airport, Hotel, Coffee  
Shop, Broadband)

**City, Community**  
(Last Mile, Remote  
Coverage, Fixed and  
Mobile Broadband)

**Cellular/ PCS /Satellites**  
(Miles / Regions, National,  
Continents, Fixed and  
Mobile Narrowband)



**Bluetooth**  
Feet to 10's of feet

**WLAN 802.11X**  
(10's, 100's of feet)

**WMAN 802.16, 802.20,**  
Ad-hoc, Beam Forming

**Cellular/Satellite**

## Backup charts

## Component One - Infrastructure

### In Phase I of the Infrastructure component

- A validation of vision and goals for a connected community and campus
- An evaluation of competitive and environmental considerations
- An assessment of existing infrastructure network architecture for both wired and wireless (RF viability)
- A description of how a campus can provide cellular and WiFi/WiMax services to campus (and community)
- The identification of business requirements and a recommendation for a “self-funding” business model, and partner options
- An analysis of business and technical options with a high level technical approach
- A recommendation for a solution design

## Component One – Infrastructure (continued)

Subsequent phases of the infrastructure component project include:

- Phase II                      Solution Workshop
- Phase III                     Pilot/Market Trial
- Phase IV                     Architecture Evaluation & Pilot Expansion
- Phase V                      Operational Rollout
- Phase VI                     Ongoing Product Services Support

## Component Two – Application Delivery & Messaging

The Application Delivery & Messaging component enables the delivery of legacy and new campus applications to wireless devices utilizing WebSphere's pervasive technology. This allows for wireless devices for:

### **Students to...**

- Check their account balances
- Review class updates and course materials
- Review messages from faculty
- Be reminded when books are overdue from the library
- Pay parking tickets using voice on Web
- Purchase campus event tickets
- And perform other transactions

### **Faculty/Administration to:**

- Communicate with students
- Network with alumni
- And other transactions

## Component Three - Commerce

The Commerce component enables a campus and any of its parts, using Web-based commerce technology, to establish itself as a commerce site and allows for the use of handheld devices as point of sale devices. The option also exists for a campus to act as its own clearinghouse for financial transactions. Component Three also provides for the inclusion of community businesses in the campus commerce network.

## Component Four – Personal Safety & Security

The Personal Safety and Security component enables a campus to evaluate and improve personal safety and security on campus through the use of emergency 911 enabled cell phones.

Included in Component Four:

- Campus safety and security assessment
- Campus digital video surveillance

## Component Five – Digital Media

The Digital Media Component enables a campus to create, store, manage and distribute digital media, including:

- Financial or administrative records
- Course content
- Facilities and maintenance documents
- Video
- Periodicals and other library documents
- Museum or other archive material

# Canyon Independent School District

## Leveraging technology to enrich the learning experience

### WHY BECOME ON DEMAND:

Canyon Independent School District needed to give students access to the technology and learning tools that will help them succeed in a digital world. However, due to the rural nature of the district, broadband access was not available, and a fiber solution was cost prohibitive. To be more responsive to students' and teachers' technology needs, CISD had to overcome its geographic constraints to increase collaboration and enrich the overall learning experience.

### SOLUTION:

IBM created an innovative wireless solution that connects every classroom, teacher and student to critical learning applications and the Internet. IBM Wireless e-business Solutions and IBM Global Services – Integrated Technology Services designed and implemented a high-speed wireless network that connects each school across the 711-mile district in a hub-and-spoke design.

### BENEFITS:

- 20 additional hours of computing time per student, per week
- Anytime, anywhere access to critical learning applications
- Enhanced collaboration between schools in the district
- Nearly 50% savings over a fiber cable solution