Introduction to mobile-learning tools

Platforms and peripherals

Only existing, commercially available products.

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Introduction

Overview of the tools you need to create, offer, and access mobile learning

Two converging technologies

Microsoft, IBM, HP
PocketPC & Palm
Instant messaging
e-mail
WiFi (802.11x)

Nokia, Siemens, Samsung
Symbian OS
SMS
MMS
3G

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Range of platforms

Capabilities ← → Mobility

Software available ← → Availability

Standardized ← → Inexpensive

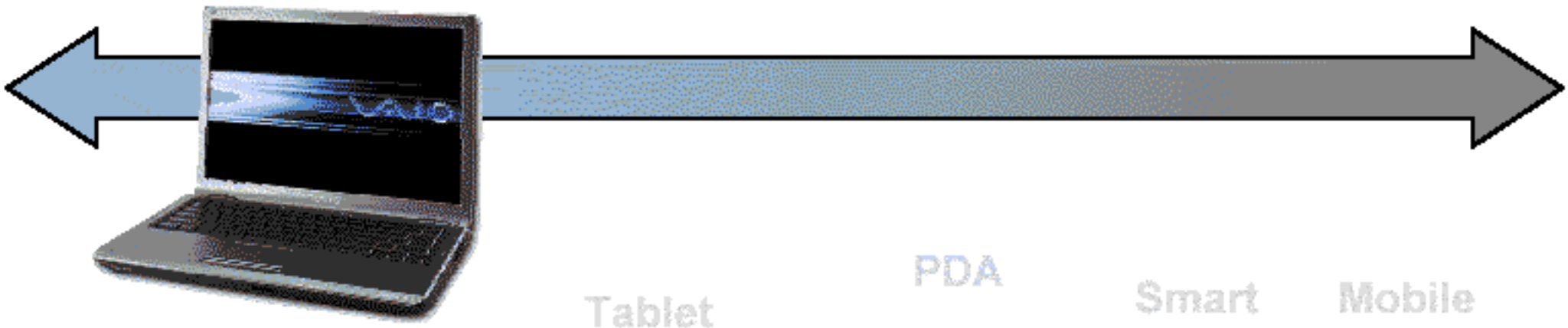
Familiar

Used for m-learning

Typical technical specifications

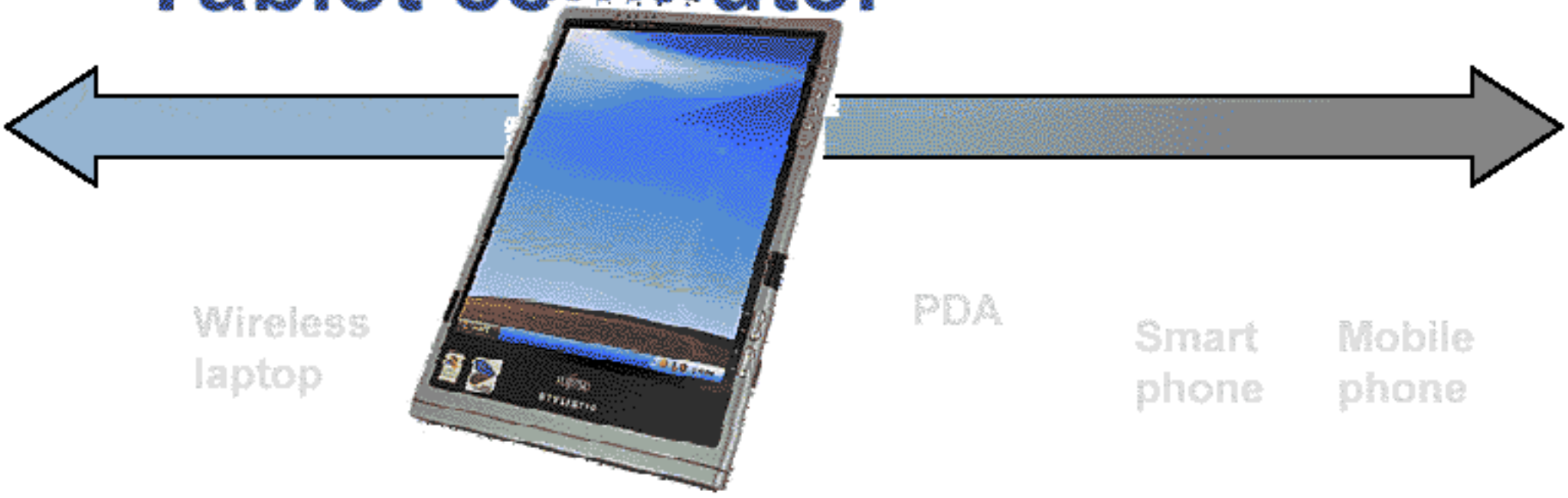
	Wireless laptop	Tablet	PDA	Smart phone	Mobile phone
Weight	< 2 kg	1.8 kg	0.2 kg	0.1 kg	0.1 kg
Processor	* * * * *	* * * *	* *	* *	*
Memory	2 GB	1 GB	192 MB	64 MB	4 MB
Storage	80 GB	60 GB	2 GB	--	--
Display	1400 x 1280	1024 x 768	640 x 480	220 x 176	200 x 150
Battery	3-5 hrs	3-5 hrs	6-8 hrs	8-12 hrs	4-10 hrs
Wireless	b, g, BT	b, g, BT	b, g, BT	phone, BT	phone
Cost (USD)	$2000	$1500	$800	$400	$200

Wireless laptop computer



- Full computer capabilities.
- Standard PC platform.
- Keyboard aids text entry.
- Can use conventional e-learning and Web content.
- OK for learning between movements.
- Too bulky for small children.

Tablet computer

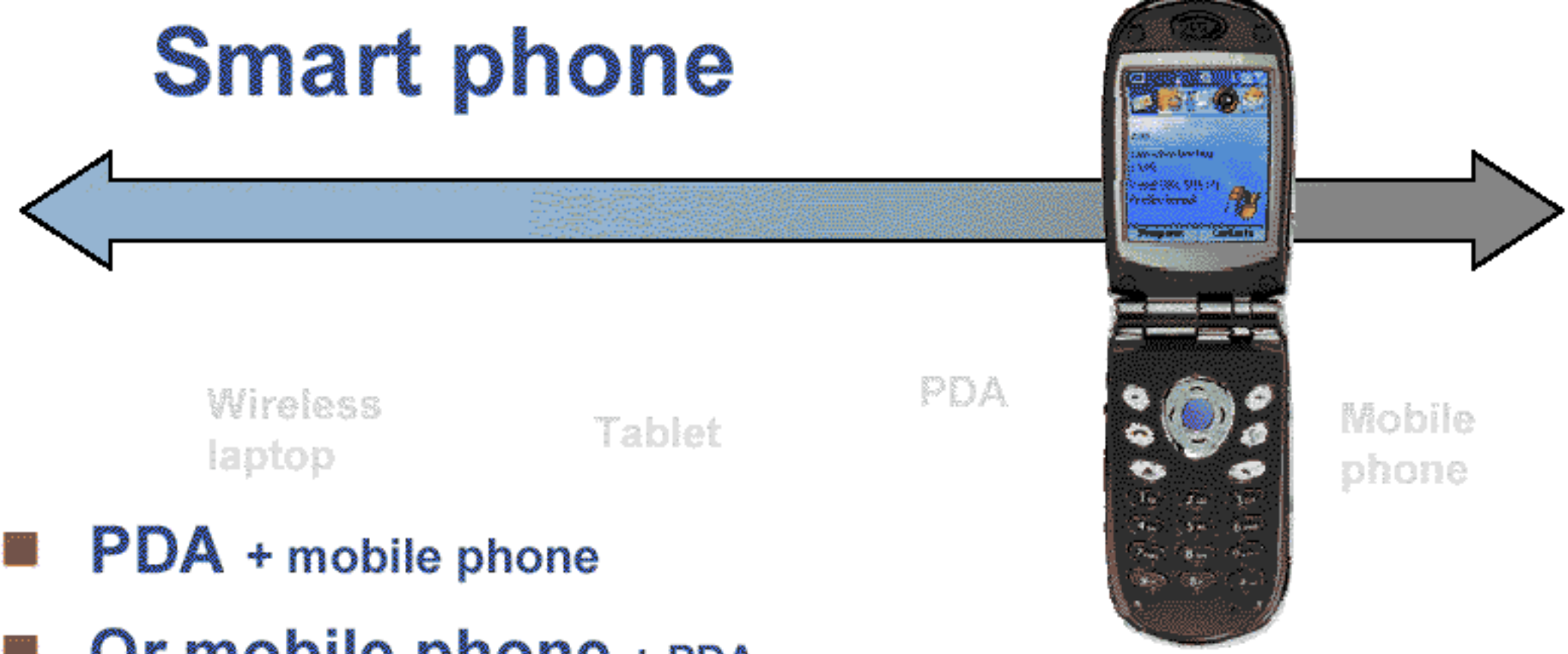


- Full computer capabilities.
- Stylus input.
- Convertible model includes keyboard.
- Good for visual subjects.
- Problem: Glare and scratches on the screen.

Portable Digital Assistant

- Scaled-down PC.
- Palm vs. PocketPC.
  - PocketPC is more computer like
  - Palm has more educational software
- Portable, even by small children.
- Many add-ons available.
  - Not compatible.
  - Add to cost.

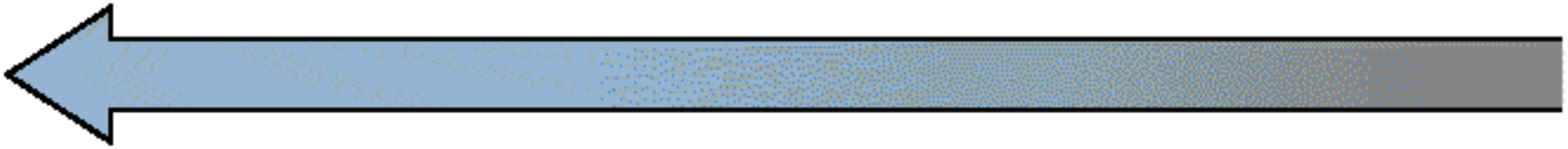
Smart phone



- PDA + mobile phone
- Or mobile phone + PDA
- Fewer devices to carry.
- Voice and computer data.

- Display size may limit m-learning.

Mobile phone



Wireless laptop

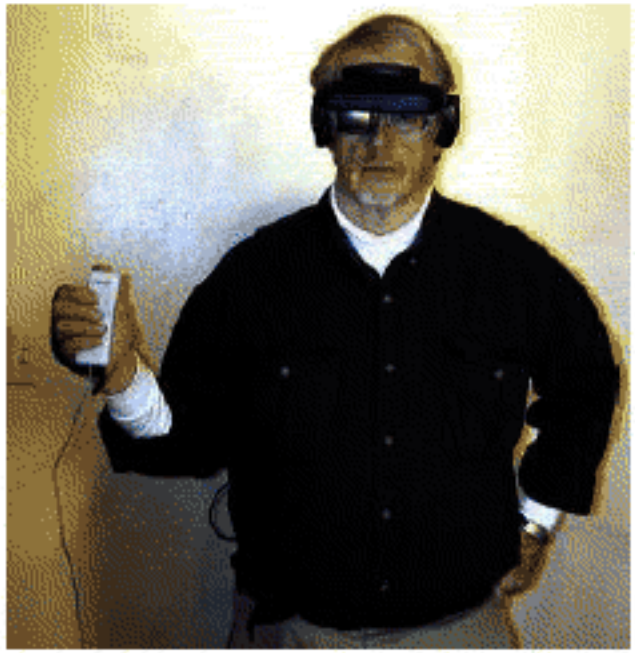
Tablet

PDA

Smart phone

- Everybody has one.
- But not the same model.
- Small display.
- Text messaging.
- Least expensive alternative.
- Adequate for exchange of simple messages.

More possible platforms



Wearable computer
- Leaves hands free
- Airport security?

Ruggedized laptop

Portable media player
Learning by sound and video

Music player
- Voice and music
- Makes data mobile

In-vehicle computer

Hardware

Capabilities valuable for m-learning

Display

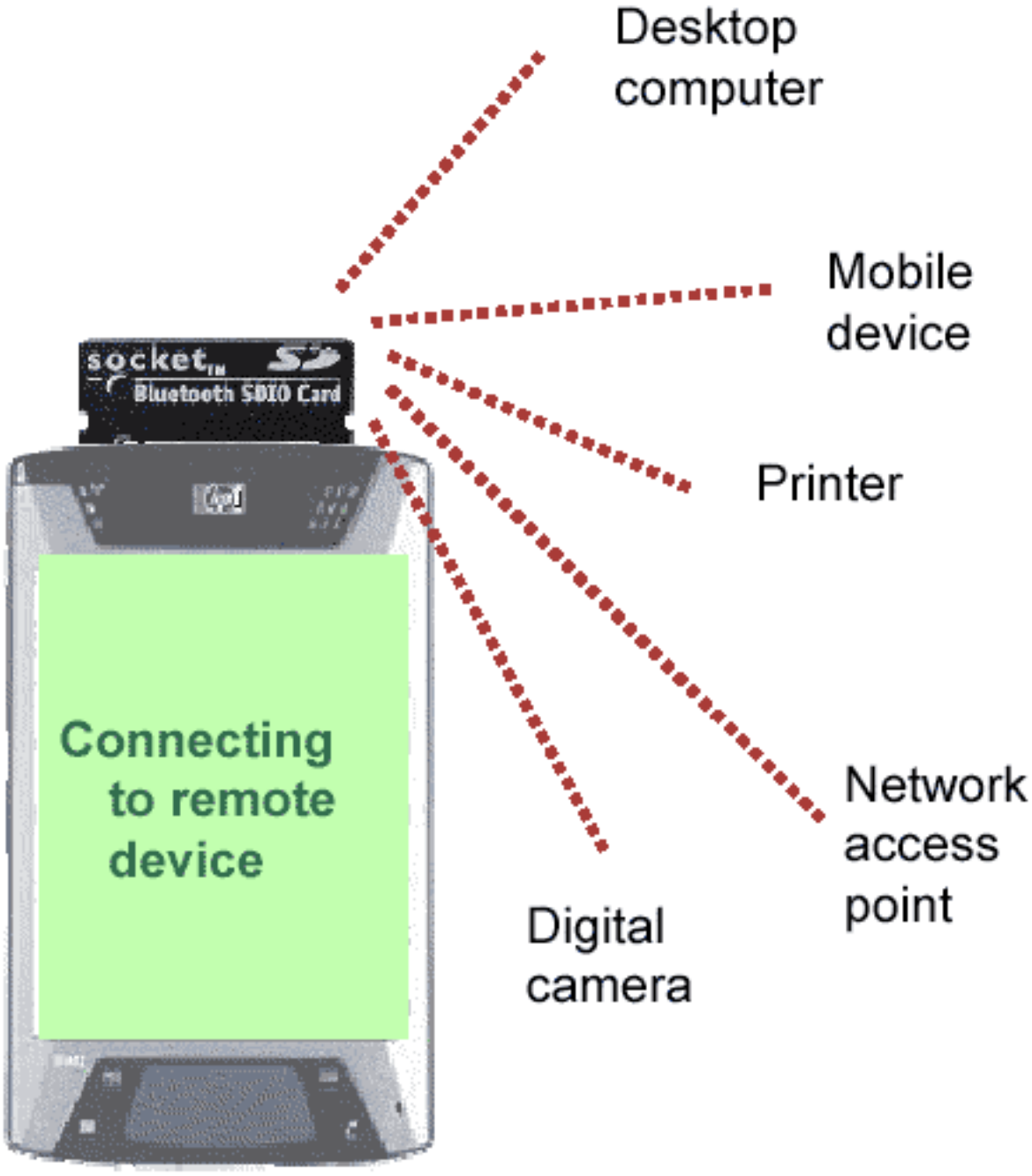
Devices scaled to consistent pixel size.

Wireless networking

- **Phone**
  - GPRS
  - EDGE
  - 3G
- **WiFi**
  - 802.11a
  - 802.11b
  - 802.11g

Type	Speed (Mbps)
Wired	100 – 500
GSM	0.01
GPRS	0.17
EDGE	0.5
3G	0.5 – 2
802.11a	50
802.11b	2.4
802.11g	50

Bluetooth wireless



- Wirelessly exchange and synchronize data
- Connect to peripheral devices
- Range: 10 m
- Cost $100 USD if not built in

GPS (Global Positioning system)

- Uses
  - Guide learners to location or object
  - Record location when data recorded
  - Teach navigation skills
  - Trigger or filter display by location proximity
  - Teach Cartesian coordinates
- Issues
  - Dropouts
  - Varying accuracy
  - Drift
- Cost: $300 USD

Data probes

- For real-time data collection
- Sensors available for
  - Temperature, air pressure
  - pH, salinity, O_2, CO_2
  - Acceleration, force
  - Light, color, sound level
- Cost: $100 - $500 USD

RFID (Radio Frequency Identification)

- Tags tiny: 4 cubic millimeters
- Range only a few centimeters
- Variety: size, frequency, active vs. passive, data rates, size of message
- RFID tag transmits identifier
  - ID number
  - Database ID
  - URL
  - XML data
- Mobile device retrieves
  - Lesson on the object
  - Instructions for activity
  - Job aid
  - Reference information
- Uses
  - Trigger object-based activities
  - Record attendance
  - Identify location to guide navigation

Still and video cameras

- Uses
  - Capture data
  - Prove accomplishments
    - Photo of self at location
    - Photo of something created
- Issues
  - Image size
  - Storage required
  - Video frame rate
- Cost: $100 - $300 USD

Software

Tools for creating content, viewing content, and collaborating

Web browsers

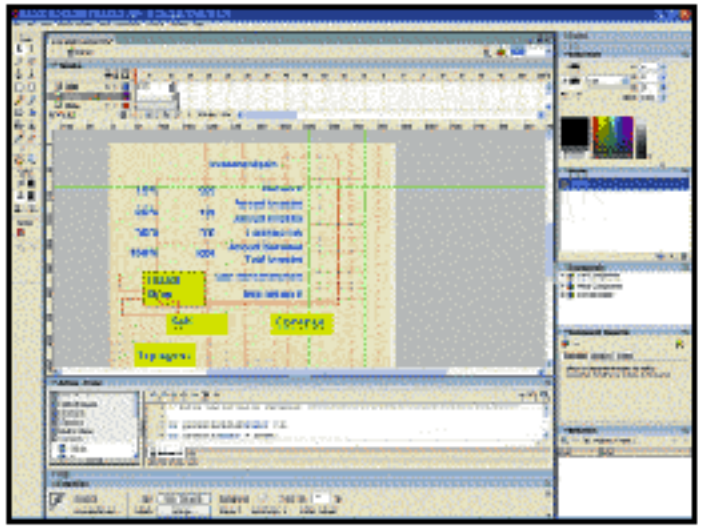
Pocket Internet Explorer
microsoft.com/mobile

Opera
opera.com

Palm Web Browser Pro
palmone.com

- Version HTML?
- JavaScript?
- XML and XSL?
- WAP or WML?
- Reformatting?

Macromedia Flash



Flash authoring environment

Shockwave Flash file format

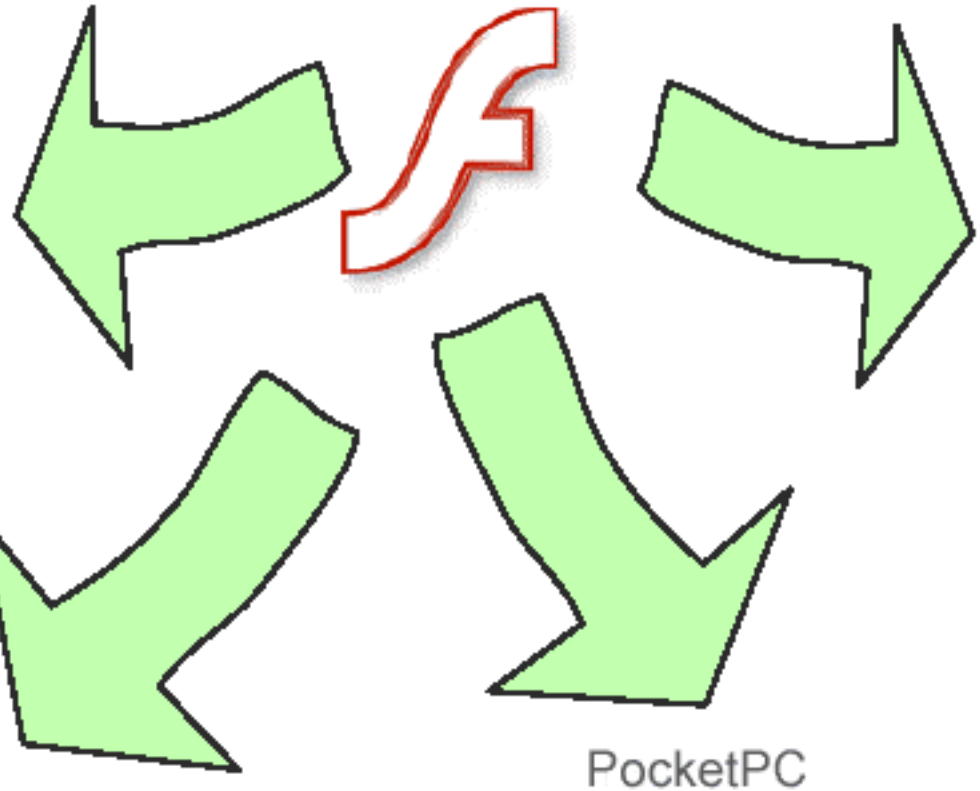
.SWF

Flash players

Other applications save in Flash file format

Flash Players (multiple)

Desktop, laptop, and tablet computers
Flash Player 7



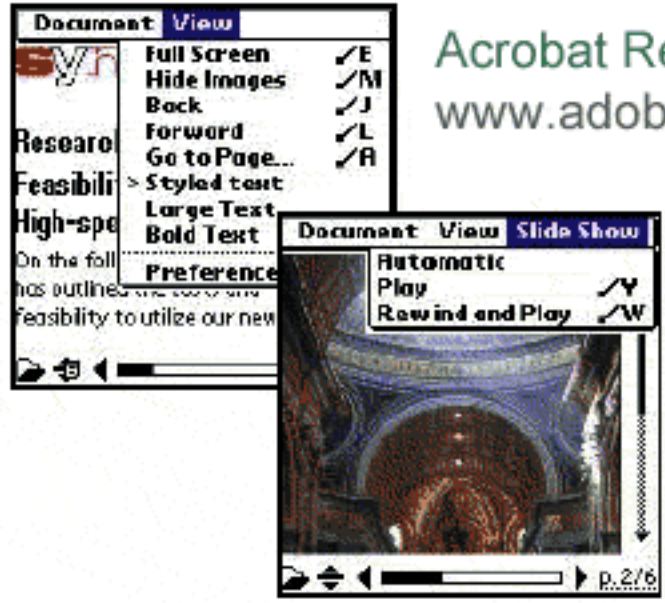
Mobile phones
Flash Lite 1.1

Microsoft TV
MSTV
Flash Player 5

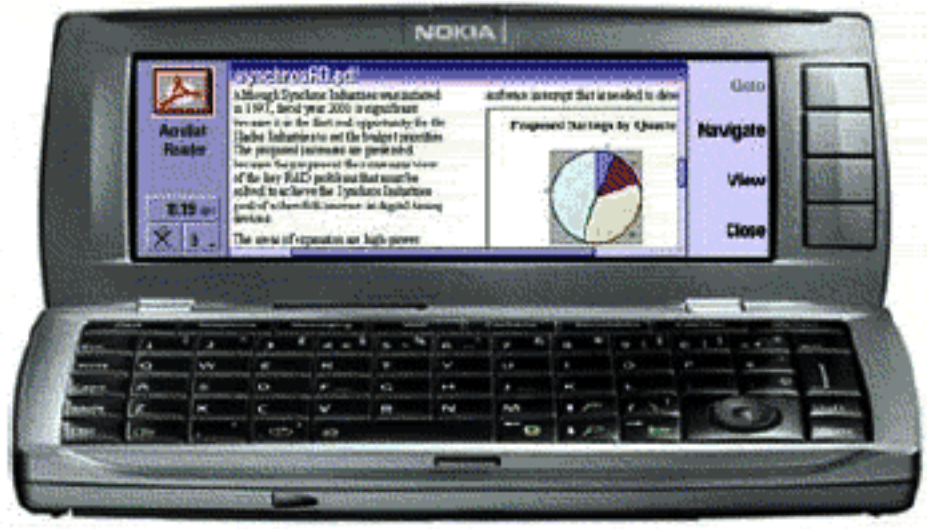
PocketPC
Flash Player 6

Acrobat PDF Reader

Acrobat Reader for Pocket PC
www.adobe.com

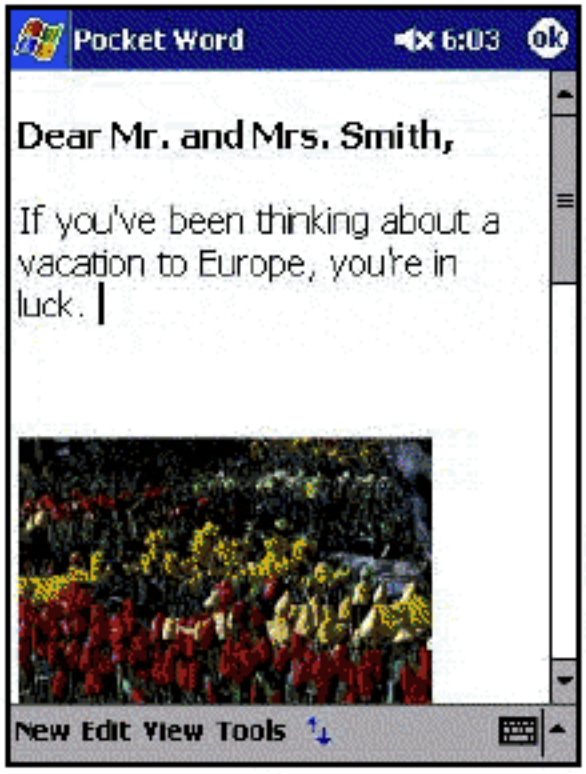


Acrobat Reader for Palm OS
www.adobe.com

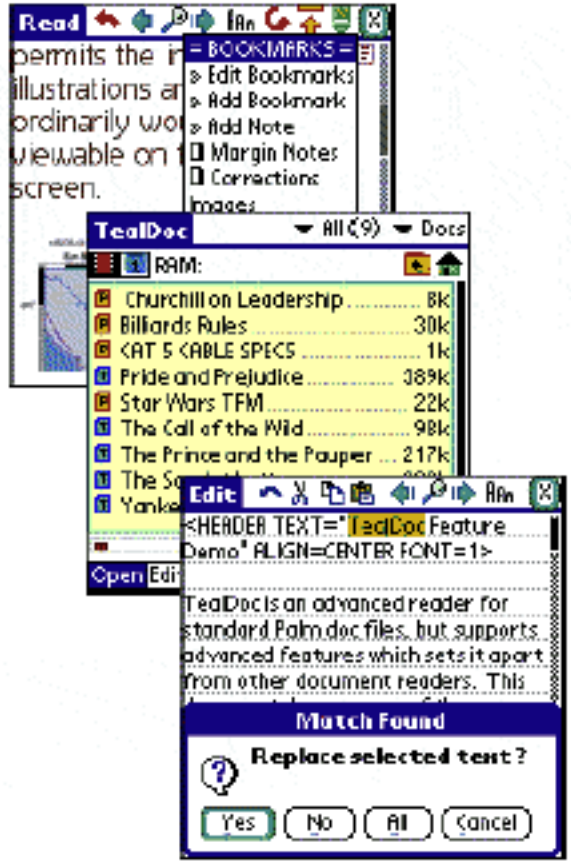


Acrobat Reader for Symbian OS
www.adobe.com

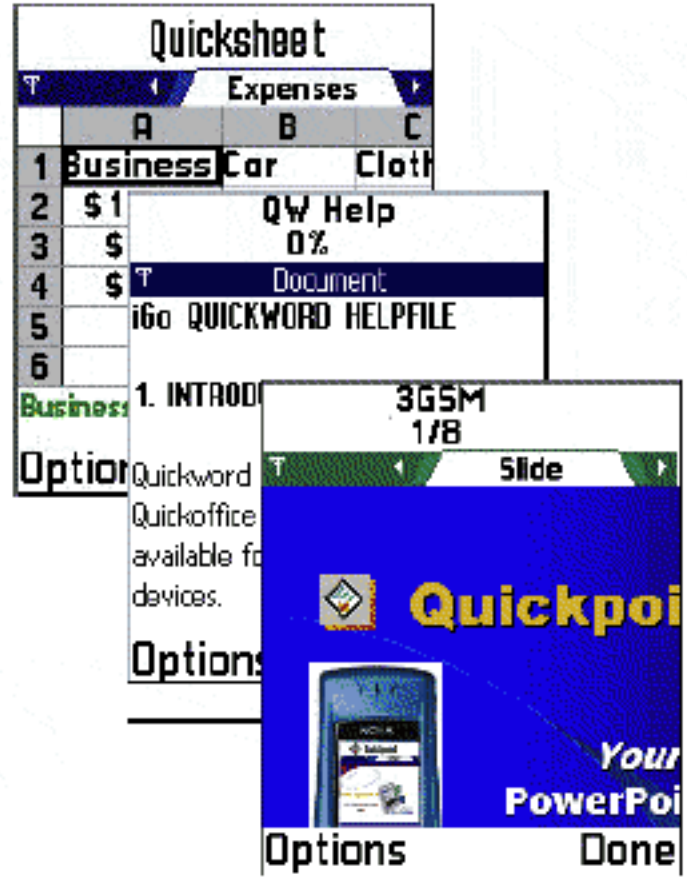
Readers for MS Office documents



Pocket Word
(included on
Pocket PC)
Microsoft.com

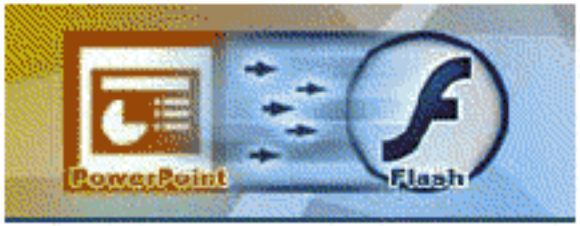


TealDoc
tealpoint.com



QuickOffice
quickoffice.com

PowerPoint converters & players



PowerCONVERTER
presentationpro.com

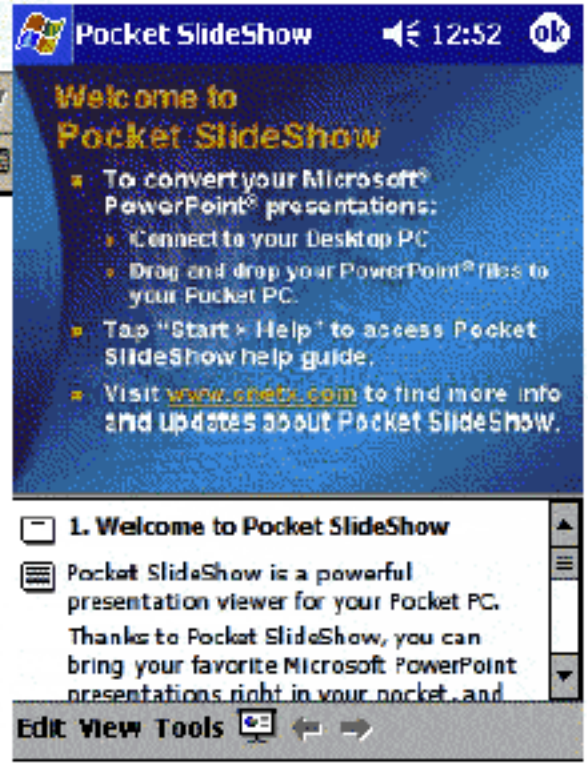
Articulate Presenter
articulate.com

webex™

Presentation Studio
Mobile Client
webex.com

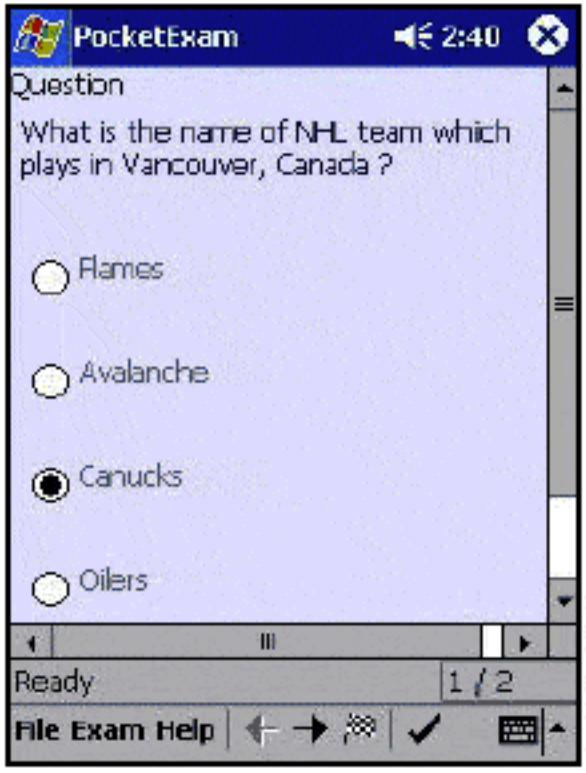
Pocket Slides
conduits.com

QuickPoint
quickoffice.com

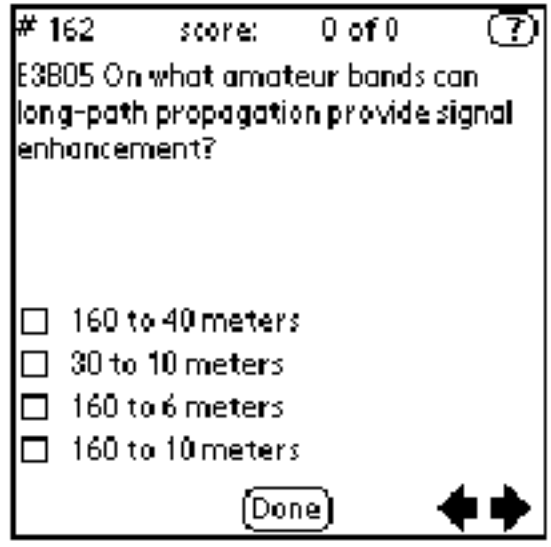


Pocket SlideShow
CNetX.com

Tools for testing



PocketExam
www.bizon.org/pocketexam/



Quizzler Pro
www.quizzlerpro.com

Caution and guidance

Concerns about m-learning technologies

Battery life

- Short battery life doomed several projects
- Battery packs or multiple recharging stations required
- Li-ion technology best today
- Fuel-cell technology delayed

More concerns

Issues raised by m-learning technologies:

- Health
  - Eyestrain
  - Repetitive strain
  - Radio emissions
- Intellectual property protection
- Theft of devices
- Theft of identity
- Privacy
- Political unrest
- Cheating

Technology for m-learning

Prefer proven tools.

Start with your educational goals.

Do not forget learners.

Pick a practical platform.

Budget for peripherals and software too.