Mobile Learning– Here and Now

An Upside Learning Point of View

Technological developments and the increase in the mobile device penetration among the population have led to sustainable change in all spheres of our lives - radically changing the way we live and learn. This Point of View paper takes a comprehensive look at mobile learning - starting with the basics and delving deeper into the nuances of mLearning design. Besides this, the paper also highlights a framework for evaluation, identifying three core areas - Usability, Technical, and Functional, which are handy while considering varied mobile devices available. It addresses key trends occurring in Mobile Learning space and its rapid growth across businesses, globally.

Contents

Introduction:

More and more humans are bringing devices into their lives that connect them to the global network in its myriad forms. As a facilitator for social interaction and for mobile learning, these networks are unsurpassed in mankind's history. The network and its nodes, the phones you and I carry around in our pockets, have reached critical mass. A veritable third of humanity now carries a mobile communication device with some amount of computing power and sophisticated input and output features – that's four billion people!
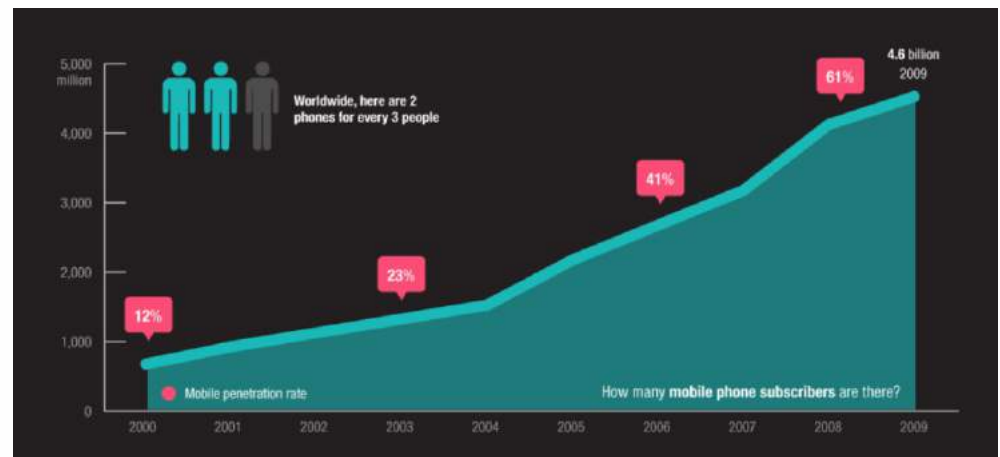
By 2012, it's predicted that smart phones will outsell desktops, notebooks and net-books put together. This is radically changing the way we live and learn - mobile learning is here, now, and real.

Organisations are rapidly waking up to the fact that human networks have the potential to and are already adding tremendous value to the products and services they offer. Of the varied ways that these can be leveraged, performance support and learning will be one area where huge benefits will be obtained. The tree of digital convergence has borne fruit, and it is only now that we are now picking the low-hanging, mobile learning being one of them.

As younger individuals start to enter the workforce they bring with them a perpetually connected, communicative, transparent and contributive culture. I believe the digital divide is real and involves several generations. It seems the younger members of the workforce prefer synchronous (real-time) collaboration tools over asynchronous tools.

In the future of collaboration in the workplace, tools like IM along with other real-time applications may gradually replace email (ex., Google's Wave, which was a fore-runner). For effective collaboration, workers will benefit from a toolbox that contains a variety of networking, communication and learning tools. What tools one would use will depend on various factors – the business process at hand, the number and location of individuals collaborating in the activity, the individual's personal preferences, and organisational requirements.

"The unprecedented evolution of mobiles continues to generate great interest. The idea of a single portable device that can make phone calls, take pictures, record audio and video, store data, music, and movies, and interact with the Internet - all of it - has become so interwoven into our lifestyles that it is now surprising to learn that someone does not carry one.
As new devices continue to enter the market, new features and new capabilities are appearing at an accelerated pace. One recent feature - the ability to run third-party applications - represents a fundamental change in the way we regard mobiles and opens the door to myriad uses for education, entertainment, productivity, and social interaction."

As the quantity of information available to us increases exponentially, and the general pace of our digital lifestyles accelerates, the ability to navigate, access, validate and share information will be the KEY skill in an increasing complex and information dense environment. Already, we are huge consumers of information streams, it will only be a more demanding cognitive task to monitor and make sense of such large amounts of data. Also, fueling the rapid increase in adoption of mobile/cell phones is the advent of more powerful telecommunication networks.

From a time when networks that only did voice, to ones where they now support a whole range of data and internet access services, has enabled the phone to go from a simple communication device to one with far more potential. One of the areas with the largest potential is learning.

With pervasive data access enabled by networks, work can begin in earnest to provide applications that realise the potential of mobile technologies.In the 2009 Horizon Report, mobiles have moved into the "Time-to-Adoption Horizon: One Year or Less" from two to three years timeframe in 2008:

With the bulk of individuals carrying a device in their pockets capable of acting as an agent and mediator for learning content and applications, the advent of mobile learning is upon us; let's make the best of it. 2010 is the year that's forcing us to think about what mobile technology can do for learning.

Defining Mobile Learning

We can look at mobile learning in two distinct contexts – first as a tool to meet a learning need, second as a learning content delivery platform. While these two contexts are implicitly linked, it helps to look at them separately to understand how mobile technology can actually benefit learning.

When I think about mobile learning, I like to refer to Dr. Conrad Gottfredson's Five Moments of Learning Needs:

- ▶ When Learning for the First Time
- ▶ When Wanting to Learn More
- ▶ When Trying to Remember
- ▶ When Things Change
- ▶ When Something Goes Wrong

If we were to use mobile learning to meet these learning needs, we'd find that it fits best into the last three. (In theory, you could use it for all needs.)

When trying to remember – Mobile technology can perform very well as learning aids. Mobile devices' ability to search and access content that helps in remembering makes it an excellent learning aid. Just a few years ago such just in time access to information was not possible, mobile technology fits the niche for such learning situations perfectly.

When the things change – In a workplace that's rapidly changing, employees are expected to keep their knowledge and skills in line with that change. This demands continuous learning. ELearning remedied the situation somewhat by providing computer based training but it was bound to the desk, or the computer itself at the very least, while the change that led to the learning need wasn't necessarily confined to the desktop. This means any content associated with change can be made available through that device regardless of the learner's location and time of day. Learner can quickly access information related to the change meeting their learning need.

When something goes wrong – The most demanding of all learning needs is the situation in which something has gone wrong. Typically, at such times learners are under pressure to come up with answers, to fix things and restore normalcy. Learning at this time mostly restricted to accessing information about the type of problem encountered, its varied solutions, and troubleshooting while implementing those solutions. Again mobile learning fits this situation perfectly, by allowing learners to access information through a device carried on the person, irrespective of location and time.

Accenture

Herman Miller
EPSS

It's important to note that when I'm referring to content, I'm not pointing to conventional elearning, but more of knowledge units that document the varied knowledge the enterprise generates and manages using a knowledge management system. Mobile devices will soon be able to seamlessly integrate with such knowledge systems providing up-to-minute information from across the enterprise. Powerful semantic searches will let learners access the

Wikipedia defines mobile learning as "Any sort of learning that happens when the learner is not at a fixed, predetermined location, or learning that happens when the learner takes advantage of the learning opportunities offered by mobile technologies"

In other words, mLearning decreases the limitation of learning location with the mobility of portable devices. Simply put, mobile learning is the acquisition or modification of any knowledge and skill through using mobile technology, anywhere, anytime and results in the modification of behaviour.

In this simple definition:

▸ Mobile Technology – refers to any device that is designed to provide access to information in any location, or while on the move.

▸ Terms such as teaching and training are not used in this definition. It is not suggested that these methods of facilitating learning will disappear; however, greater emphasis will be placed on self-directed learning.

▸ The behaviourist idea of an 'alteration in behaviour' is used because as the information age continues to progress, more people will have access to knowledge, often and easily. However, without an alteration in behaviour, it is not deemed to be learning.

While in the future it's plausible that all types of learning content will be mobile, we aren't quite just there yet. In the current situation, it's more feasible to build mobile learning into the blend, rather than replacing your existing training methods.

I've often mentioned that if we were to step back in time and look at instructional methods through history, one would notice that the advent of a new delivery method hasn't fundamentally altered the existing methods. What happens is that the new delivery medium gets co-opted and integrated with the existing methods of delivery. This is nothing but creating a 'blend'; similarly, we cannot expect mobile technology to ever completely replace instructor led training or computer based training; however, it will surely be included as an adjunct to these methods initially. And when it matures, which is starting as I write this, it'll become a substantial part of the training blend.

Determining the Need for Mobile Learning

In my opinion it's only appropriate for mLearning to be adopted for specific learning situations. How does one quickly determine whether mobile learning is appropriate for your learning need and audience? What are the key considerations that drive the decision to go for mobile learning?

Simply ask a series of questions.

Can we use mobile capabilities to enhance learning?

The operative words here are 'to enhance learning'; consider whether the capabilities offered by mobile technology can actually enhance the learning experience you want to deliver. If your answer at this point is 'no', stop right there and consider other options.

Which of those capabilities would interest would-be learners?

Having determined that you can use mobile capabilities to enhance learning, the next logical step is to ask which of those capabilities would actually interest learners. Would it be the ability to access content regardless of location? the ability to use GPS? or to use a specific application? It's important that the learners/would-be learners have an interest in that capability, or any learning associated with the use of that capability just won't happen.

Will ubiquitous connectivity better enable learning interaction?

Next ask if ubiquitous connectivity will enhance learning interactions amongst peers, fellow learners, instructors, SMEs, mentors and others. If your answer is 'yes', mobile learning has great potential in meeting your learning need.

What services will help learners be more productive?

Mobile technology lets learners access a variety of services. We need to determine from amongst these many options, which is most suitable for learners to use such that learning or performance is enhanced. Try to list how such services can be used by learners, would they use it to call their mentors? Or would they use the mobile device to post to blogs or comment in forums?

What content is already on hand that could be made easier to access via mobile devices? Does content already exist in another form?

Moot point – having existing materials that lend themselves to conversion into a mobile format give you a distinct advantage in adopting mLearning. All you need to get started is a simple conversion. When looking for such content remember to look beyond your regular training department or L&D; and consult with acknowledged subject matter experts, look up the recognised power users and leaders. This is where you'll find content; it's important to recognise that it doesn't solely exist in learning and training silos.

What network will be used for distribution? What actions or activities will need to be tracked?

Having considered that mobile technology is appropriate for enhancing learning, and having identified the services, capabilities and content that will be required for learning. We move on to actually asking about tracking learners, how will learning activities or content be administered and tracked? This is typically where the learning/knowledge management system comes in, and a determination of how it will track these mobile based activities must be made.

Will mobile learning integrate with other corporate systems or does it need to?

As with determining tracking of learning activities, one also needs to consider the need for integration or data exchange with established corporate management information systems or human resource information systems. As the cost for such integration varies widely, it's ill-advised to try any sort of integration while piloting mobile learning your organisation.

Who will handle any needed user support?

Next decide who will handle user support and how it will deal with issues that emerge while piloting your mLearning initiative. Be advised that there will be definite need for support, as with any technology initiative, users will need to have questions answered, trivial though they might seem.

While they're simple, these questions take time to answer; however, it's crucial to find the answers if you want any sort of mobile learning to be effective. There is always the likelihood that as you answer these questions, you may just realise mobile learning isn't what's needed in your situation.

The Design of Mobile Learning

There really is very little different about designing mobile learning from other forms of learning. The guidelines that apply for effective learning are really not much different but for the change in context. These are five tips I give customers who are setting about implementing some form of mobile learning, even if it is the smallest component in a blended solution. These tips may seem self-evident, yet I felt it good to reiterate.

KISS Keep it short and simple – a rule applied to all types of learning content also applies for mobile learning content. This rule is significant in light of the nature of mobile devices and the situations in which they tend to be used. There can be frequent interruptions and learner attention to the device tends to be of a short span.

Typically, we wouldn't design any sort of mobile learning intervention to run beyond five minutes. As with elearning, complex navigation and interaction is best avoided in mobile learning, as mobile devices differ in screen size and input types from typical personal computers.

Crisis Response

Low Information Density – do not attempt to duplicate the length and information density of elearning modules. The technology may make it possible to deliver dense content, but in practice the situations and devices with which the content is accessed isn't amenable to such content density. The types of content suitable for mobile learning have low information density.
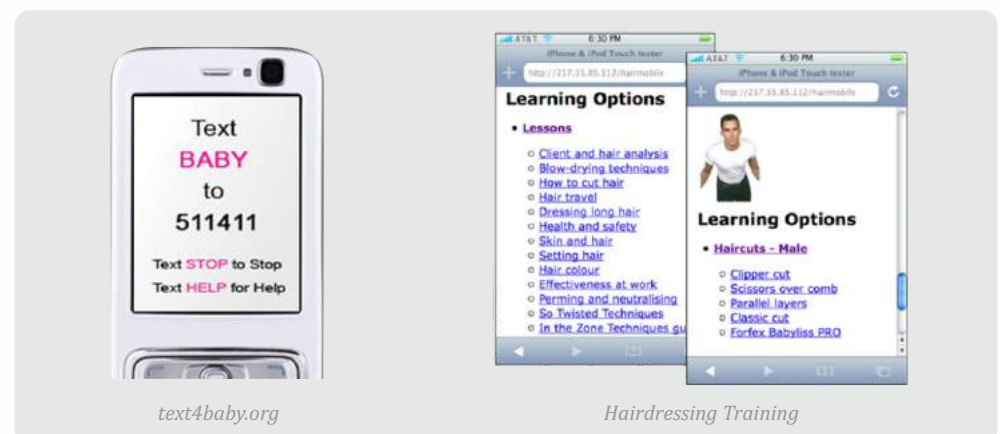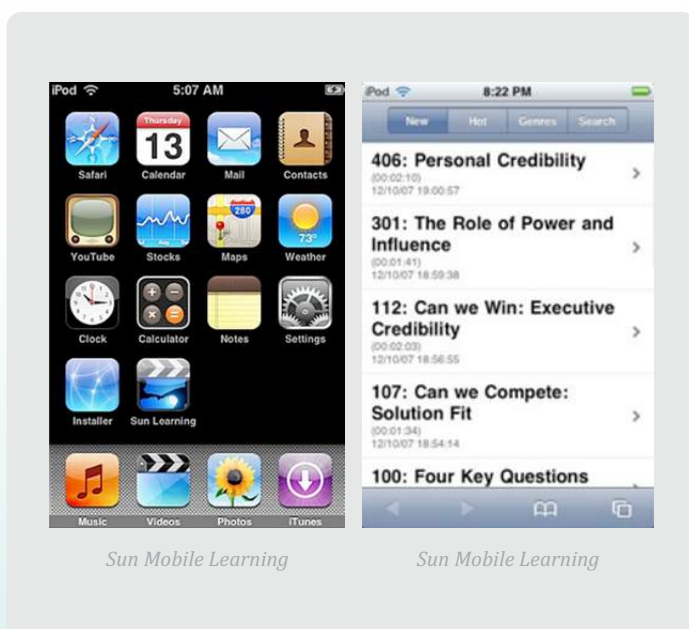

text4baby.org   *Hairdressing Training*

Sun Mobile Learning   *Sun Mobile Learning*

Easy with the Multimedia – again, just like elearning, the careful use of media elements are important in mobile learning. Do NOT use media in situations where it's not required, splash animations, graphics that are purely aesthetic and unnecessary interaction. In most cases, there is a cost associated with developing and accessing such content, as it is likely that there is cost for downloads and bandwidth.

However, it's important to mention that some mobile devices like the iPod can be used offline; they can be connected to a computer and files copied onto them, avoiding download and bandwidth costs. We see this as true of an increasing number of devices, and eventually perhaps all will support some form of tethering.

Include Elements of Collaboration – Mobile devices have unprecedented adoption levels simply because their ability to provide synchronous communication makes them unparalleled social tools. When used as a part of blended program, mobile technology can be used to facilitate interaction between peers, experts, mentors, etc. Done properly, there is tremendous learning value in these human interactions. If you're thinking of using mobile technology in your blend, this (in my opinion) is the best use, provided its done right.
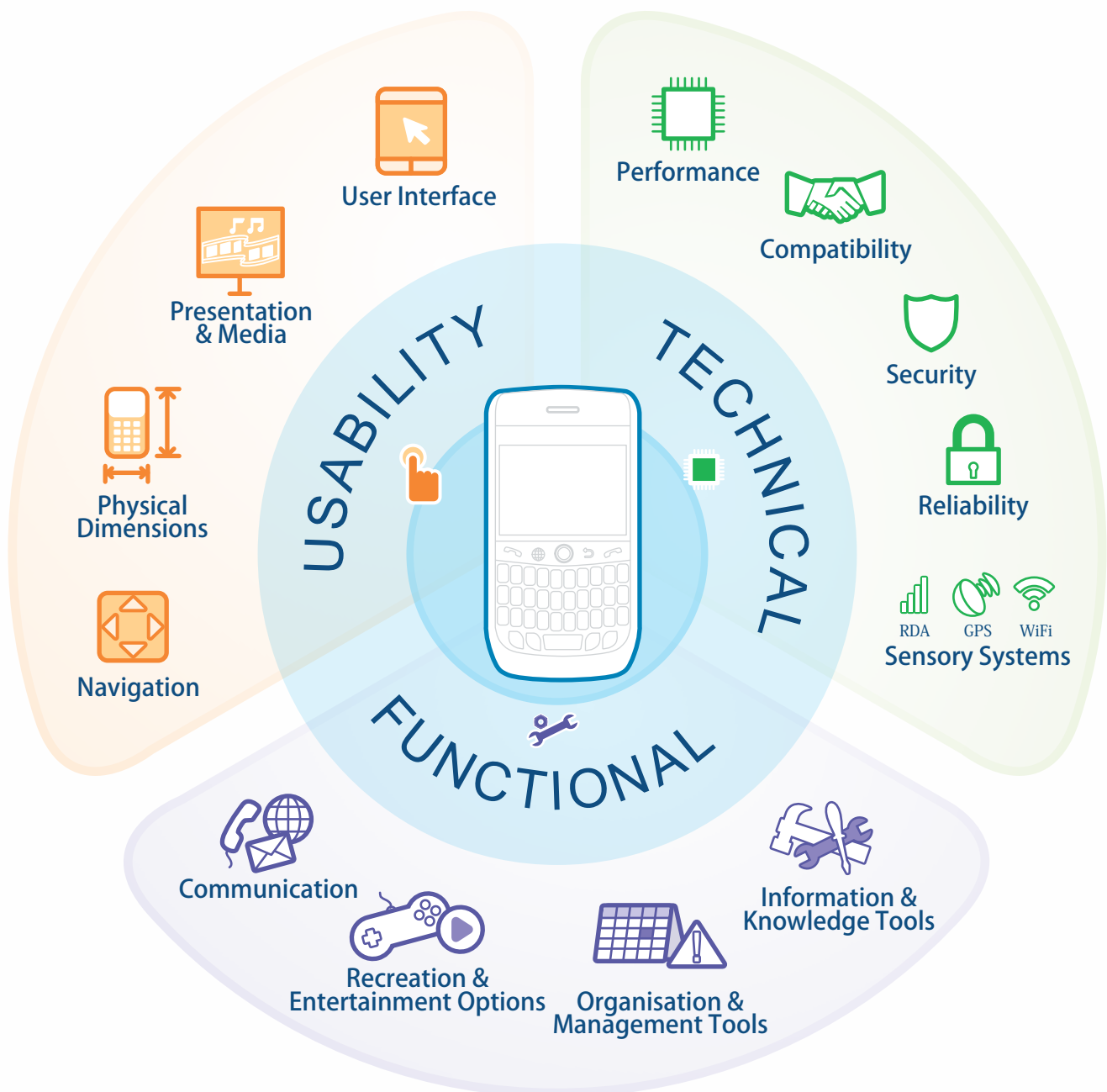

Hilton Garden Inn - Ultimate Team Play

Provide Tools (Applications) and Not Just Content – Mobile devices do render content; however they are far better as utilitarian tools. Their ability to compute and display combined their personal and intimate nature open up a world of possibilities. The newer ability to write with applications for specific hardware also provides lots of possibilities. Geo-location based tools, social networking tools, access to search and information databases, customised calculators, newsreaders, games, simulations – the options are quite varied. If you are considering mobile learning, this is one application of the technology you definitely want to consider.
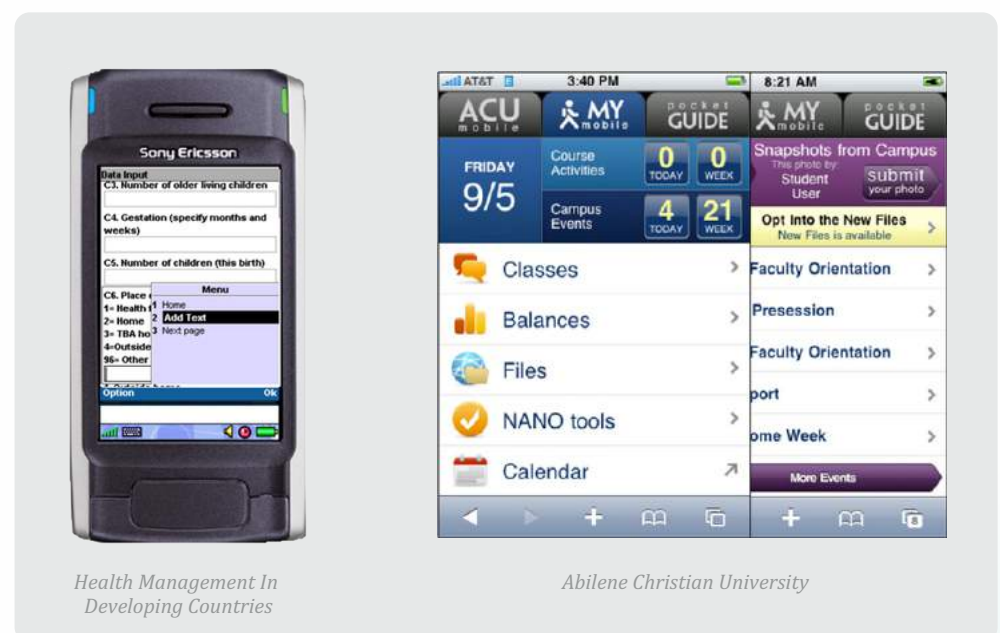
Health Management In Developing Countries

Abilene Christian University

This framework has been adopted from a paper published in the International Journal of Engineering Education; Economides, A.A. & Nikolaou, N. – Evaluation of handheld devices for mobile learning. It suggests that mobile devices can be evaluated in three distinct areas – Usability, Technical, and Functional.

USABILITY

User Interface

Presentation & Media

Physical Dimensions

Navigation

TECHNICAL

Performance

Compatibility

Security

Reliability

RDA   GPS   WiFi
Sensory Systems

FUNCTIONAL

Communication

Recreation & Entertainment Options

Organisation & Management Tools

Information & Knowledge Tools

This framework for evaluation is useful when considering the varied devices available in the market and with users today – it can create a simple and effective feature/price comparison.

Usability – relates to the ease of understanding, remembering and learning to use the device itself and its varied tools. Devices should be easy to carry and have an easy to use interface for their functions.

User Interface

1. Appropriate display layout
2. Simple to understand and easy to use –menus, toolbars, buttons, status messages, etc.
3. Multilingual support
4. Ability to personalise/customise device
5. Disabled access friendliness

Presentation & Media

1. Ease of reading, writing, or providing other input to the device
2. Varied media support (text, graphics, images, audio, video)
3. Fidelity of multimedia reproduction (consider reduction in render quality of media due to device limitations)

Navigation

1. Simple information organisation and structure
   a. File system
   b. Tools
   c. Shortcuts
2. Home and Help links on every screen
3. Search capabilities
4. Consistency in user interface and interactions

Physical Dimensions

1. Size
2. Weight
3. Design attributes

Functional – relates to the number of features, functions and tools of the devices. Both synchronous and asynchronous modes of communication should be supported. The ability to access, retrieval, process and display varied types of information is important.

Communication

1. Phone
2. E-mail
3. Web access
4. Asynchronous text messaging
5. Synchronous instant messaging
6. Multimedia messaging
7. TV
8. Internet data download/ upload access

Information & Knowledge Tools

1. Recorders
2. Office applications
3. Calculator
4. Drawing tools
5. Media Player and Gallery
6. Voice to Text and Text to Voice features`
7. File sharing
8. Dictionaries and Translators

Organisation & Management Tools

1. Calendars and clocks
2. Database access tools
3. Agenda tools, organisers, alerts, reminders, etc.

Recreation & Entertainment Options

1. Accessing varied media including music and film
2. Playing games
3. Using multimedia tools

Technical – relates to the device's performance, compatibility, connectivity, security and reliability. Processing power, memory capacities, and ability to view and run a variety of software file formats are important. Compatibility and support for varied protocols and platforms. Bandwidth and connectivity limitations must also be examined. Security is a growing concern as mobile devices can be prone to loss or theft.

Performance

1. Processing power
2. RAM and speed of RAM
3. Expansion storage options and limits
4. Communication technologies (Telephony, GPRS, IrDA, WiFi, 3G, HSPDA, Bluetooth, etc…)

Sensory Systems

RDA

GPS

WiFi

1. Display
2. Keyboard and Buttons
3. Cameras, Microphones, Recorders
4. GPS navigation
5. Special purpose – RFID readers, bar code scanners, augmented reality scanners, smart card functionality, cashless transaction technology

Compatibility

1. Open Source vs. Closed Source – Hardware, Operating System and Applications (…vs. iPhone, WinMo, Android, Symbian, etc.)
2. Specific focus on Browser Applications
3. Multimedia format support

Security

1. Security Certificates
2. Encryption and Cryptography support
3. Anti virus, anti spam, online protection
4. Password/passkey functionality
5. Screen/Keypad locking feature
6. Biometric identification features

Reliability

1. Battery life
2. Hardware and software crash handling and recovery
3. Online updates to firmware, OS, applications
4. Technical support and documentations

Conclusion

As with any instructional technology, using mobile learning has a unique set of advantages and disadvantages.

The clear advantages include:

I   The ability to access learning content, including video and audio from anywhere

II   The ability to collaborate with other learners, instructors, experts, etc. this collaboration leads to increased learning

III   The ubiquity of personal cell phones, their affordability, portability and multiple media friendly features make them powerful learning aids

IV   The comfort digital savvy learner have with using the many media capability of their devices affect learner psychology, so does owning such a device not clear how's this an advantage

V   The ability to put training where the actual job performance takes place

Some disadvantages are:

I   Mobile learning may offer a fragmented learning experience. While accessing learning content or activities on the go one encounters distractions.

II   That the learner may not be able evaluate their learning experience (meta-cognitive) despite the collaboration it enables with peers, instructors and experts

III   The definite issue caused due to the small screen sizes mobile devices possess, similarly storage was also an issue, but this has been mitigated with the advent of cheap standard flash memory

IV   The absence of a common hardware platform makes it difficult to develop content that will run consistently across devices

V   Bandwidth considerations, while growing bandwidth is now available through mobile, it's still not enough to deliver some types of content

While there are pros and cons to using mobile learning, it's the same with any technology and we're optimistic about widespread adoption, we feel it's already starting with enterprises and academia. In line with the optimism, Upside continues to develop varied solutions for the mobile learning space. Please contact us if you're interested in a mobile learning solution.

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About the Author

Abhijit Kadle has more than ten years of professional experience in multimedia design and development.

His design expertise comes from having worked on design-driven projects for multimedia kiosk software development, multimedia instructional simulations, computer-based training, web-based training, learning management systems and standards.

His interests range from genetics, evolutionary biology, biochemistry, engineering, technology, computing to electronic games, media, communication, and the design of user experience and interaction.