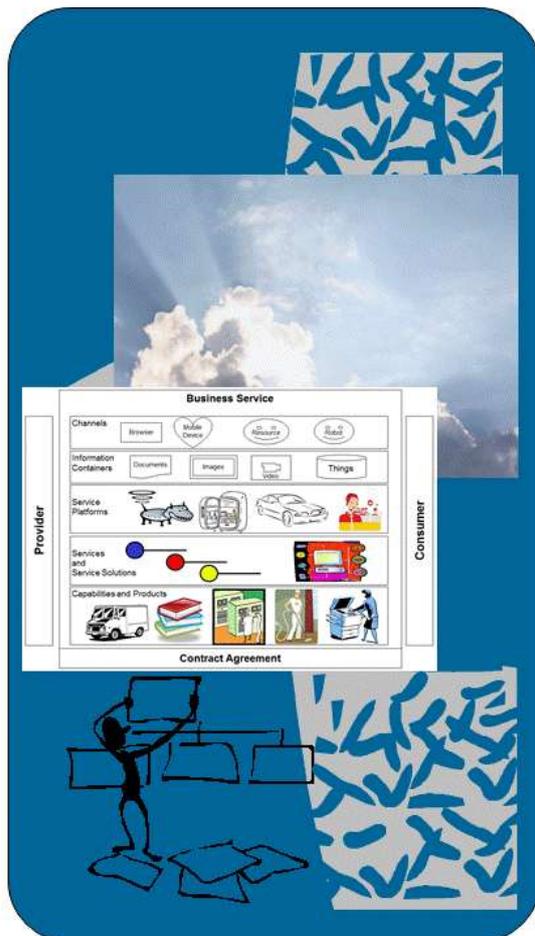


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Practice Guide

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By Lawrence Wilkes

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Independent Guidance *for* Service Architecture and Engineering



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Introduction

Enterprise Mobility – the use of mobile computing within the enterprise – has gained significant momentum in recent times due to the power and increased penetration of smart devices together with ubiquitous connectivity, and the pressure from the workforce to support BYOD (Bring Your Own Device).

Analogous to the early days of PC adoption, it is the end users who are largely creating the ‘pull’ for enterprise mobility, rather than the IT department driving this out from the center. As a result IT departments are often reacting to individual demands in an ad-hoc manner at the project level, leading to inconsistencies, duplication and gaps in capabilities across the organization. Though this is par for the course with any such new initiatives.

As a consequence, organizations are increasingly assessing their enterprise mobility strategy.

It is tempting for organizations to try to satisfy requirements by simply acquiring technology and products from their favored IT vendor, who will inevitably claim their Mobile Device Management (MDM) and Mobile Enterprise Application Platform (MEAP) products will cure all ills.

In order to put some consistency behind their EM efforts and to effectively govern them, a good starting point for any organization is to establish their Enterprise Mobility Framework (EMF).

However, perhaps reflecting the maturity of the market organizations won’t find an EMF available ‘off the shelf’ from an industry body or even some dominant vendor, and so must establish their own.

Hence this report sets out to establish the basis of an EMF and outlines some of the key elements. To support the report we are also publishing an Enterprise Mobility Concept Model and a Capability Model.

Drivers

There are a number of converging factors driving the momentum behind Enterprise Mobility (EM),

- **Smart Phone penetration.** There has been an explosion in the use of smart phones. Smart phones have recently reached the ‘tipping point’ with over 50% market share in the USA and UK¹, and still growing significantly.



- **Tablet computers.** Now emerging not just as a consumer product but as a potential replacement for ‘traditional’ computers in many user roles in organizations.
- **Mobile Internet.** Providing ubiquitous connectivity.
- **Apps.** The desire for mobile applications, or ‘apps’, that are perceived to improve upon the basic web browser experience and provide a richer and more focused or ‘controlled’ environment for both end-user and customer interaction.
- **BYOD.** Consequent demand from employees (who are also consumers) for their companies to permit a ‘Bring Your Own Device’ (BYOD) approach.
- **Smart Systems.** The use of devices and sensors to provide automated data collection and autonomous operation and response, will in part be based on mobile technologies. EM should cover more than just the human usage of devices.
- **Mobile Payments.** In the enterprise market, especially retail, mobile payment technology such as Near Field Communications (NFC) will be a growing driver.
- **Legacy Devices.** Many organizations have large investments in ‘1st generation’ mobile devices that are often costly, proprietary, and out of date and incompatible with new technologies (even barely supported by their manufacturers), that are ripe for replacement by cheaper yet more powerful generic smart devices plus apps. What once required specialist hardware can be replaced by generic functionality built into most smart devices.

Challenges

Responding to these factors will present challenges to most organizations.

Consumer Driven

The mobile market is driven by consumers. The consumer (led by consumer-oriented vendors) is setting the trends and establishing the de facto standards, not the enterprise.

Inconveniently for organizations, their employees are consumers too – hence the demand for BYOD. Specialist roles aside, IT organizations may find it counterproductive trying to dictate mobile technology to their end-users. This may seem counterintuitive to organizations, but is the lesson they surely should have learnt from the introduction of PCs.

Even if the organization gives their employees a device, the employee will still prefer to use their own. Who wants two smart phones in their pocket?

That said, there will clearly still be distinctions in terms of device provisioning for different sectors of the workforce. Whilst the office workers, sales force and execs may be allowed BYOD, the needs of ‘Shop floor’ and manual workers may still require they are provided a device that is provisioned specifically for their role and which may require specialist hardware or capabilities, as well as being ruggedized (even though those specialist items may simply be wrapped around a consumer device).



Multiple Proprietary Platforms

Few organizations are in a position where they can standardize on a single platform, and this is clearly impossible in a BYOD scenario. This will impact both the delivery of applications, and manageability, where multi-platform solutions must be provided.

The application platform for mobile devices is currently dominated by iOS and Android. Organizations may find trying to deliver cross-platform applications sub-optimal, especially when trying to simultaneously support PCs and laptops, which they must continue to do.

Organizations most certainly cannot pick sides. It is a consumer driven market remember, where the demand is increasingly for ‘apps’ and not cross-browser websites.

However, the dividing line between laptop PC and mobile device will be increasingly blurred. For example by Windows 8, which may provide a common application platform for both, and by mobile devices that are every bit as powerful and capable as laptop PCs. But Windows 8 won’t replace anything; it will just add more diversity to the mix.

Similarly, manageability must be provided across multiple platforms. Whether it is labeled Mobile Device Management (MDM), Content Management, Asset Management, Configuration Management or Fault Management, it all must be provided on a multi-platform basis.

BYOD Support

Consumer-led technology and BYOD strategies are all well and good, but how does the organization ensure the necessary QoS that end-users will still demand, and particularly minimize the security risks that consumer technology and BYOD may bring?

Security may seem to be the most obvious issue with BYOD, but given the organization’s own devices are not immune from security violations, the best strategy is to ensure that aspects of security are addressed in a way that is independent of who owns the device.

Manageability of BYOD will be just as challenging. Solutions to MDM, Content Management, Asset Management, Configuration Management or Fault Management must all address BYOD as comprehensively as the organization’s own devices.

However, the key place to start with supporting BYOD is the development of appropriate policies.

What defines Enterprise Mobility?

Organizations may struggle to define the boundaries of their EM. Each organization needs to ask the question of where for them does ‘traditional’ computing end, and ‘mobility’ start? Is it defined by the extent of mobility of their workforce, the way they connect to the network, or is it the platform used? Is a mobile device used in a fixed location still considered mobile? Is an unattended mobile device (fixed or not) that requires no human operation part of EM?



Service Interfaces Inadequate?

Data synchronization and access to enterprise resources will need to be provided via various integration mechanisms. However, existing enterprise resources, or the existing means of accessing them, may not suit all mobile use cases.

Whilst SOA is a key enabler of EM, the availability of existing service interfaces may not fully satisfy requirements. For example, a mobile application may need to be able to work offline using a synchronization approach, but the existing service interfaces that provide access to the enterprise resources it requires may not have been designed with this style of interaction in mind. Hence some wrapper or intermediary must be provided. EM will expose inadequacies in service design.

Not the traditional Enterprise IT Vendor Market

The EM market isn't dominated (yet) by the likes of IBM, Oracle, SAP, or Microsoft. Like everyone else, they and their traditional IT department customer, are responding to user demand rather than leading.

The challenge is that mobile-platform providers such as Apple or Google on the predominantly consumer-led device side of the equation have little interest in solving EM challenges whilst enterprise vendors have little to no control over the device side. Hence enterprise vendor support for the latest mobile features may lag.

However, unlike mobile-platform vendors, independent and Enterprise IT Vendors are more likely to provide cross-platform and platform-independent solutions.

Expect enterprise IT vendors to attempt to gain a greater share of the market, primarily through acquisition.

Establishing an Enterprise Mobility Framework

As stated in the introduction, to put some consistency behind their EM efforts, a good starting point for any organization is to establish their Enterprise Mobility Framework (EMF).

Regardless of the domain, we find that establishing a Reference Framework (RF) works well as it establishes the basis and ground rules for subsequent work. In our experience, many organizations often lack a consistent framework – or conversely they have too many – and effort is wasted trying to apply consistency after the fact.

In any given domain, a Reference Framework (RF) provides a common backplane for consistency, collaboration, sharing, and reuse. Without a consistent framework, the domain in question will remain an interesting concept but deliver suboptimal business value. With an appropriate RF the work of individual projects, programs, divisions and partners will be coordinated with just enough formality to ensure that the many moving parts can fit together when and were needed.

However, EM will not happen in isolation. It will be an adjunct to existing IT and business activities. Hence, there is no need to develop the EMF in isolation either. Rather, the focus should be on the deltas compared to 'business as usual'. As a result of developing several frameworks, such as our own CBI-SAE Framework and a RF for Cloud Computing², we subsequently defined a generalized RF and the process for establishing an RF in any domain; and this provides the basis for a version specialized for EMF illustrated in Figure 1.

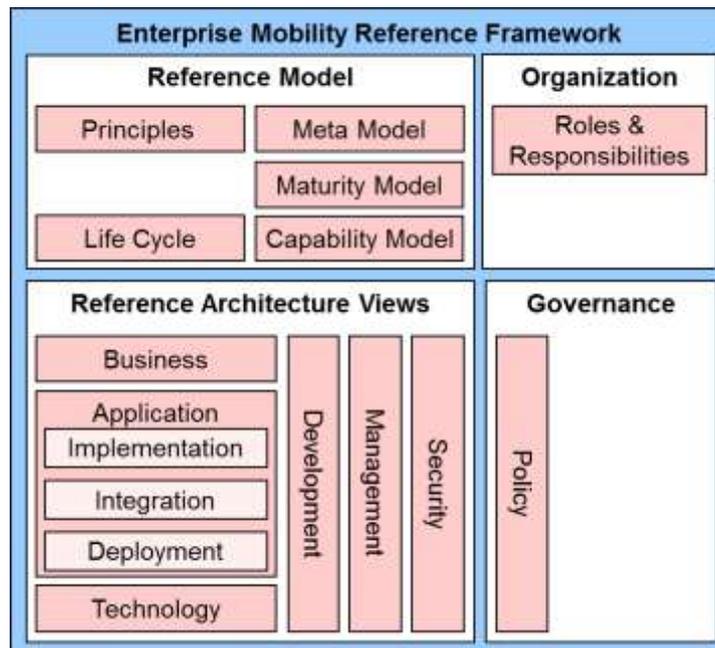


Figure 1 – Enterprise Mobility Reference Framework

The specialized EMF shown in Figure 1 does not imply other elements of the generalized RF are ignored, rather that EM activities would deviate little from standard practices within the enterprise. Tables 1 and 2 provide an overview of the key framework elements that will need to be addressed for EM.

RF Element	Enterprise Mobility Factor
Reference Model	
Meta Model or Concept Model	Establishing the terminology and providing a common understanding of the concepts that apply to EM will be key to achieving consistency across an organization. A meta model also ensures rigor and precision in deliverables, policies, and other artifacts.
Capability Model	It is important to establish a product and implementation agnostic view of the capabilities or functions required to support Enterprise Mobility, as this provides for example, a technique to establish and match device and application profiles, or to select products or solutions by comparing the capabilities required and provided
Maturity Model	Most organizations will not achieve maturity in EM overnight, but through a series of phases. Understanding what capabilities are needed, and when, is key to achieving goals without making unnecessary investments before there is a real need. The Capability Model should provide the basis for this.

RF Element	Enterprise Mobility Factor
Principles	A set of principles are always a useful starting point. They should be addressed at the outset to define the boundaries and scope of EM within an organization, and help establish what is required of capabilities that are acquired to support EM – in terms of the principles they should adhere to.
Life Cycle	The key ‘assets’ of EM should be traceable, manageable and governed from the time they are planned through to retirement. Documenting their life cycles helps to understand the policies, deliverables and activities that apply at each life cycle state.
Organization	
Roles & Responsibilities	As with any initiative, identifying roles and responsibilities is essential. Does EM responsibility fit neatly within the existing Infrastructure organization? Perhaps an EM CoE would be more appropriate
Governance	
Policies	A set of EM-specific policies needs to be established in order to govern EM activities. For example, what policies apply to BYOD, or ensure effective security or manageability? Establishing the EMF should include identifying the types of policies that will be required

Table 1 – Enterprise Mobility Framework Elements

Reference Architecture

The reference architecture element of the EMF should define the conceptual models as well as any ‘blueprint’ architectures for EM that will help to ensure consistency and completeness across the organization in the delivery of EM solutions.

A Reference Architecture will be organized by views. The views in the generic RF are applicable, whilst Table 2 identifies views that are going to be most pertinent to EM solution delivery.

Establishing the reference architecture is not about providing the solution to the requirements identified below in each of these views, but providing the conceptual and architectural basis for those solutions.

Hence a key activity is also mapping the following elements from the rest of the EMF against each of the reference architecture views,

- Policies that apply
- Capabilities required or provided
- Roles and Responsibilities
- Maturity model streams and phases

Additionally, the Meta Model should contain a corresponding package for each view.



Over time, a library of patterns, templates and blueprints should be established for each view.

RF Element	Enterprise Mobility Factor
Reference Architecture Views	
Business	<p>EM-specific content here should include an understanding of what mobility means to the business, the goals the business and IT hopes to achieve through EM, and identification of the business scenarios and use cases that require EM solutions.</p> <p>Expect that addition multi-channel behaviors will be required and cross-channel processes will need to incorporate the mobile channel.</p>
Application	<p>Addressing mobility in applications is going to be a core activity, not just in terms of development but also acquisition.</p> <p>For much of the application life cycle, normal enterprise activities should apply. However, there are clearly going to be mobile-specific capabilities that must be supported by applications as well as supporting platform-specific delivery.</p> <p>Mobility must address both the client device and the enterprise server sides of the equation.</p> <p>A conceptual Mobile Application Architecture should be developed together with appropriate patterns, templates and blueprints.</p> <p>Extensions to the Enterprise Application Architecture will be required, perhaps with additional layering.</p>
<ul style="list-style-type: none"> • Implementation 	<p>The main issue will be balancing platform independence whilst providing platform specific delivery. Ensuring a separation of logical and physical architectures will be key, as will the separation of the functions of the mobile ‘client’ from the enterprise ‘servers’ and other information sources.</p>
<ul style="list-style-type: none"> • Integration 	<p>An Integration Architecture will be essential to address issues such as data synchronization together with the provision of a Service Architecture and other integration capabilities. Enterprise Mobile Applications must be fully service-based.</p>
<ul style="list-style-type: none"> • Deployment 	<p>Managing the deployment of devices, applications and content will overlap with normal enterprise activities, but needs to comprehend the use of application stores, and the capabilities of various devices.</p>
Technology	<p>EM is highly technology-centric. Consumer adoption is largely driven by new technology which is still changing rapidly.</p> <p>Establishing the Technology Architecture to support EM is of high importance, and again patterns, templates and blueprints will be useful here.</p>

RF Element	Enterprise Mobility Factor
Security	<p>It goes without saying that mobility raises security concerns, and BYOD will only increase the risks.</p> <p>Priority will be on establishing policies and providing appropriate infrastructure to manage identity and access, and to enforce the policies.</p>
Development	<p>This section of the EMF should be focused on identifying the capabilities – in terms of methods, tools, languages, frameworks, etc. – together with the best practices required to support the delivery of EM solutions. Whilst MEAP products will provide a solution to some of the requirement, establishing the set of capabilities required first provides a benchmark for selection. Organizations should buy products to fit the EMF, not the other way around.</p> <p>As mentioned, for much of the application life cycle, normal enterprise activities in terms of process and deliverables should apply.</p>
Management	<p>Addressing the management of devices, applications and content is a key topic for EM. There are a 101 MDM products and solutions available, and so establishing a product and implementation agnostic view of the management capabilities required is essential to ensure proper coverage.</p>

Table 2 – Enterprise Mobility Framework Reference Architecture Views

This report does not detail the complete EMF, but focuses on some of these key building blocks that will be required.

Scope

It may seem counter intuitive to ask what the scope of EM is when it is already embedded in the title!

However, so called ‘enterprise’ initiatives are often less ambitious than the name implies. In a very large organization, the EM may only apply to a division or geography. There is also the common issue of whether such ‘enterprise’ frameworks are interpreted as implying a source of enterprise-wide recommendations and guidance or whether it demands compliance.

Additionally there are alternative approaches to adoption that may be used. Enterprise does not have to imply ‘centralized’, as enterprise-wide coverage could also be achieved via a federated approach.

Ideally an enterprise should strive to have one common EMF and manage divisional or geographical requirements on an exceptional basis. Hence it is important to determine the organizational scope, identifying divisions, geographies, partners, related ecosystems that will need to have some level of alignment with some aspects of the framework.

Therefore it is important to establish the scope of the EMF and its intended audience and ensure that the appropriate governance and policies is established.

Across the enterprise, items that really should be common should include the reference model, core policies that impact cross-enterprise usage, together with patterns, templates and blueprints that should be standardized wherever possible in order to maximize organizational consistency and reuse.

These items form the basis for a common vocabulary that establishes the foundations for an inherently agile enterprise – that can more easily respond to business and technology change because there is a shared language.

High Level Conceptual Architecture

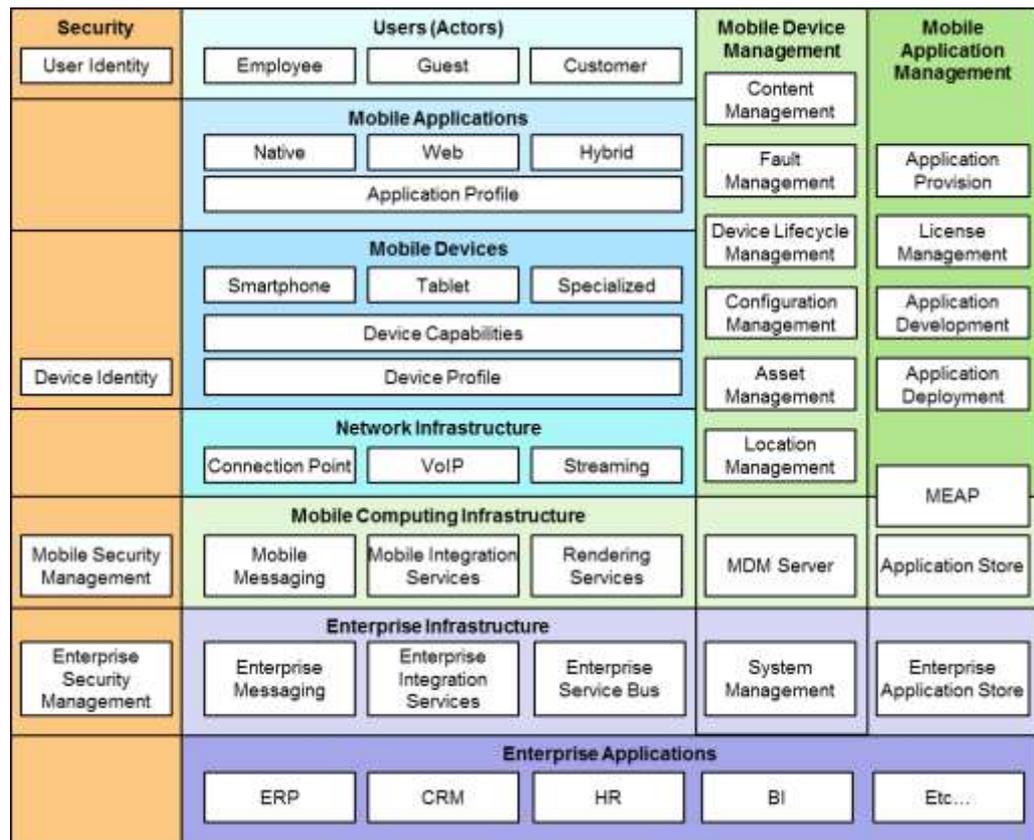


Figure 2 – Enterprise Mobility High Level Conceptual Architecture

Figure 2 provides a high level conceptual architecture for Enterprise Mobility.

Breaking down the architecture it shows a set of ‘layers’ comprising,

- Different classes of Users (Actors) interact with Mobile Applications.
- The requirements for different types of Mobile Applications, defined by Application Profiles.
- Mobile Applications run on Mobile Devices. The capabilities provided by the different types of devices, defined by Device Profiles.
- In this way, applications can be matched to suitable devices, via their respective profiles.
- Mobile Devices are connected to the Network, which also provides VoIP and streaming capabilities



- The Network connects the Mobile Device/Application to various elements of the Mobile Computing Infrastructure that provides messaging, integration and rendering capabilities.
- In turn the Mobile Computing Infrastructure connects to the Enterprise Infrastructure that provides the gateway to Enterprise Applications.

Orthogonal to these layers – as they are relevant to all layers – are ‘stacks’ for

- Security including the identity of users and devices that permits them access to applications and enterprise resources.
- The management of mobile devices, including the necessary mobile computing infrastructure and enterprise infrastructure components.
- The management of mobile applications, again including the necessary infrastructure components such as application stores.

A key factor in creating such a conceptual architecture is to agree on the concepts and terminology used.

Hence creating an EMF should start by defining the Capability Model and the Meta Model.

Capability Model

The capability model provides a product and implementation agnostic view of the capabilities or functions required to support Enterprise Mobility.

The purpose of the Capability Model is to

- Provide a systematic breakdown of the domain from coarse-grained capabilities into finer-grained capabilities that are easier to conceive, measure and compare
- Identify implementation independent capabilities
- Identify the leaf node capabilities so that independent decisions about their realization can be made

A hierarchy of the capability areas is illustrated in Figure 3. As can be seen, these map to the conceptual architecture in Figure 2.

The full decomposition of the Everware-CBDI Enterprise Mobility Capability Model can be found on the Everware-CBDI Website³.

As well as aiding understanding of EM and providing an implementation, product and technology independent way of communicating requirements, the capability model provides a mechanism by which for example;

- Device profiles can be defined (in terms of the capabilities provided by a device)
- Application profiles can be defined (in terms of the capabilities required by an application or type of application). Consequently, the suitability of a device to support an application can then be determined by matching it to the device profile
- The capabilities required by an organization unit, or by a project that has an EM element can be determined

- Roadmaps for the provision and evolution of capabilities can be established

The suitability of products and platforms can be assessed or compared

- (do they provide the required capabilities?)

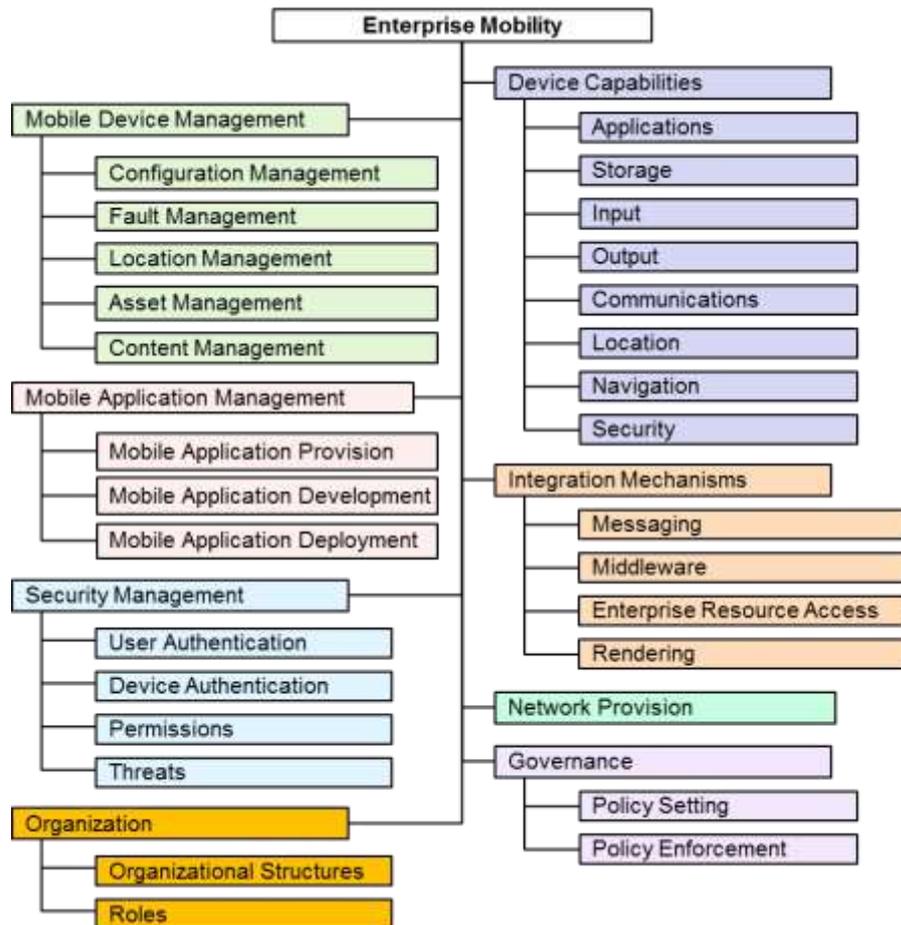


Figure 3 – Hierarchy from Enterprise Mobility Capability Model

An understanding of how to develop and use a capability model for any domain, together with useful capability planning resources is also detailed an earlier CDBI Journal report⁴

Meta Model or Concept Model

Developing a concept model or ideally a detailed meta model is useful – some including ourselves would say vital – because it forces architects to define the terminology that will be used in the domain they are working in, and aids understanding by showing the relationships between concepts. It helps to discard redundant concepts and provides consistency by ensuring everyone is applying the same terminology in the deliverables they produce to support that domain.

A complete concept model for EM can be found on the Everware-CBDI website⁵. *Note that this model is also available for download in Microsoft Visio format.*

The Everware-CBDI Enterprise Mobility Concept Model is presented as a UML Class model.

Figure 4 shows a UML package view of mobile computing concepts, with emphasis on enterprise factors. UML packages help to break down a complex model into simpler ‘chunks’.

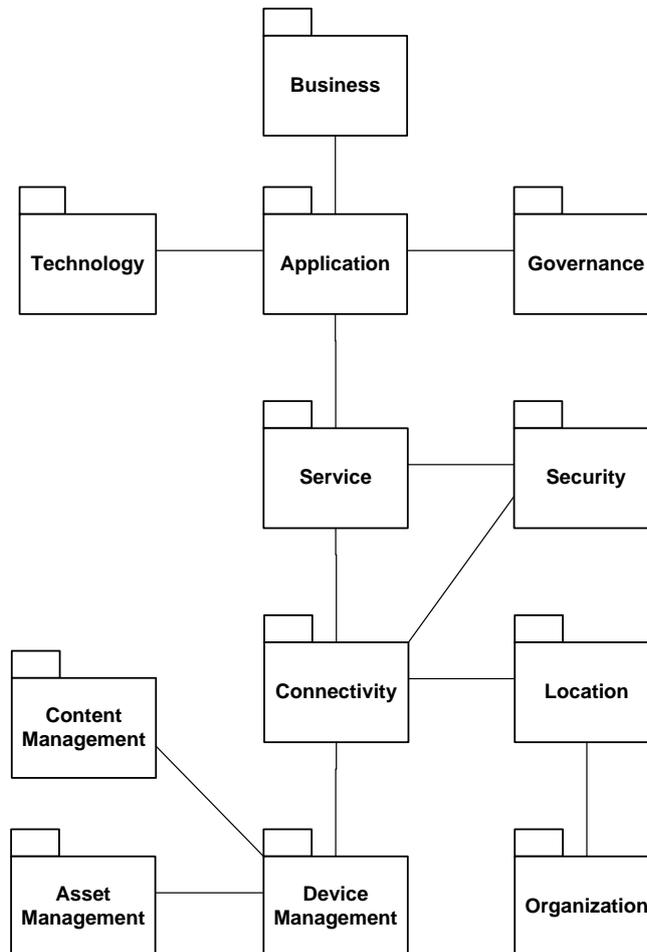


Figure 4 - Enterprise Mobility Concept Model Packages

As well as providing understanding, an EM meta model may be used

- As the basis of an EM ‘catalog’ or a form of CMDB, used to store and track all of the relevant information about the use of mobile computing within an organization.

At a minimum it can be used to compare the information managed by 3rd party products that claim to support this requirement.

- When establishing governance over Enterprise Mobility, as each class in the model can be seen as a policy subject, or providing policy context, as illustrated in Table 3.

Having such a model can help improve the precision of policies and remove ambiguity.



Principles

Organizations will need to establish their own set of principles which they agree will define and shape their approach to EM. Candidate principles include the following.

Enterprise Principles

- EM must address both the device (client) and enterprise resource (server) side of the mobile application equation
- Enterprise resource owners should be responsible for enabling EM use cases
- EM must not compromise enterprise security

Architecture Principles:

- Modularity: Mobile applications should be assembled from application components and services that are;
 - Modular and composable
 - Properly separate concerns such as the separation of
 - UI, Business Logic and Data
 - device functionality and server functionality
 - device specific and device independent components
- Service-based: Mobile solutions should be service-based where relevant and conform to SOA principles

Development:

- Portability: The development approach and tools used should enable mobile application components and services to be;
 - Designed once with multiple mobile platforms in mind
 - Developed once and deployed to multiple mobile platforms
- EM applications should maximize the potential of the mobile device, and not sacrifice functionality and usability by providing lowest common denominator solutions in order to simplify cross-platform delivery.

These two principles may appear to be contradictory, but it is a balancing act. It also should be enabled by modularity, to ensure that the granularity of components both enables portability of some components, whilst enabling device specific delivery of others

Technology Selection:

- Agnostic: As far as possible and where available, technologies and products selected should be device and platform agnostic
- Standards: Mobile solutions and acquired products, should comply with appropriate industry standards
- Manageability: Any mobile solutions and devices that are provisioned should be supportable by Mobile Device Management (MDM) capabilities



Governance

Organizations need to identify a set of policies they are going to use to govern Enterprise Mobility.

This may be in the form of a policy hierarchy. The hierarchy is likely to reflect in part the structure of the capability model.

The principles above are often codified as a set of policies.

In addition, you would expect to find policies such as the examples listed in Table 3, which also illustrates the use of classes from the meta model as policy subjects or context.

Policy Area	Candidate Policies	Policy Subject or Context
Device policies	Devices must be registered and classified according to their device profiles	<ul style="list-style-type: none"> • Device • Device Profile
Device sourcing and provisioning policies	Only devices that comply with permitted device profiles may be acquired	<ul style="list-style-type: none"> • Device Profile
	Capabilities (devices, etc.) must only be provisioned by permitted suppliers	<ul style="list-style-type: none"> • Device • Mobile Infrastructure Component • Technology Component
	Classes of devices, applications and content that must be acquired though, and subject to, corporate licensing (not individual)	<ul style="list-style-type: none"> • Device • Application • Content Item • License
	Permitted application usage and/or content blocking policy	<ul style="list-style-type: none"> • Permission • Content Item • Application
	All devices must be assigned unique ID and tracked as assets	<ul style="list-style-type: none"> • Device • Asset
BOYD policies	BOYD is only permitted for listed roles	<ul style="list-style-type: none"> • Role • Device
	BOYD is not permitted for the listed applications	<ul style="list-style-type: none"> • Application
	BOYD is only permitted where the device complies with defined BOYD device profiles	<ul style="list-style-type: none"> • Device • Device Profile
	BOYD is only permitted where the user is willing to permit the device to be subject to appropriate MDM and MAM policies	<ul style="list-style-type: none"> • Device • Device Manager
Application sourcing and provisioning policies	Only applications that comply with permitted application profiles may be acquired	<ul style="list-style-type: none"> • Application • Application Profile
	Custom applications shall be developed using cross-platform tools	<ul style="list-style-type: none"> • Application • Application Component

Policy Area	Candidate Policies	Policy Subject or Context
Operational and runtime policies	Classes or instances of devices that must be registered with, and subject to Mobile Device Management	<ul style="list-style-type: none"> • Device • Device Profile • Device Manager
	Permitted application and/or content blocking policy	<ul style="list-style-type: none"> • Permission • Content Item • Application
	Providers and consumers must comply with SLA requirements	<ul style="list-style-type: none"> • Service Level Agreement • Organization
	All mobile to enterprise interactions must log and record device and user identity	<ul style="list-style-type: none"> • Identity • Service Application
Security policies	Device and user identity must be compliant with authentication mechanisms	<ul style="list-style-type: none"> • Actor • Device • Identity
	Devices must provide remote lock and wipe capability	<ul style="list-style-type: none"> • Content Item • Device • Device Configuration

Table 3 – Some Candidate Enterprise Mobility Policies

For enterprises it is also good practice to establish the applicability or scope of policies. For example, does a policy have global, common, or local applicability or context?

Life Cycles

The key ‘assets’ of EM should be traceable, manageable and governed from the time they are planned through to retirement. Documenting their life cycle helps to understand the policies, deliverables and activities that apply at each life cycle state.

This might be documented using UML State Machines, though just a simple table will usually suffice. Table 4 identifies the states for a device, whilst Table 5 identifies the states for a mobile application.

As mentioned, these can then be mapped accordingly to the respective policies, deliverables and activities.

State	Definition	Mapping		
Permitted	A device type is permitted to be used	Activities	Policies	Deliverables
Required	Use of a device type is identified and required			
Provisioned	A device instance is provisioned (acquired, allocated from stock, etc.) and registered with Mobile Device Management			
Assigned	A device instance is assigned to an individual user, team or organizational unit			
Operational	A device instance is in use			
Decommissioned	A device instance is no longer available for use			
Denied	A device type is no longer permitted to be used			

Table 4 - Device Life Cycle States



State	Definition	Mapping		
Required	Application Requirements are complete	Activities	Policies	Deliverables
Specified	Application Specification is complete			
Provisioned	Application has been provisioned (acquired, built, etc.)			
Published	Application is published (in Application Store)			
Licensed	Application is licensed to a device instance or user (to a specific identity). Licensed does not imply it has been deployed.			
Deployed	Application is deployed to device instance. Deployed does not mean it has yet been licensed. Licensing may occur on first use.			
Operational	Application is operational. This may apply more in the context of server applications, or mobile applications that are dependent on remote resources. Where these have to be operational for the mobile client to use them.			
Removed	Application has been removed from device instance (or wiped)			
Retired	Application has been retired			

Table 5 - Mobile Application Life Cycle States

Organization

The organization section of the EMF should identify the necessary organizational structures as well as the roles and responsibilities required to support EM adoption and rollout.

This will include candidate organizational structures such as

- **EM Community of Interest.** In the early day of EM adoption, a largely informal community should be established to collaborate and share ideas and resources
- **EM Centre of Excellence.** In the mature state, a more formal Centre of Excellence (CoE) should be established to drive adoption. Responsible for publishing guidelines and recommendations, and providing expertise and support.
- The EM CoE may also act as a **EM Governance Board**, responsible for ensuring compliance and consistency

Candidate Roles include specialists in

- **MDM** who have the skills to deliver EM management solutions
- **Mobile integration** who understand the specific requirements for mobility whilst at the same time skilled in enterprise integration and SOA
- **Mobile infrastructure** who understand the specific requirements for mobility whilst at the same time skilled in enterprise infrastructure



- **EM architecture** who can develop the conceptual architectures and blueprints, as well as support mobile solution project architectures
- **Mobile Application Development** who have skills in mobile platforms

Maturity Model

Finally, organizations need to determine their roadmap for EM adoption. For this, developing a maturity model is an essential step.

Table 6 provides an outline maturity model showing,

- **Maturity Levels** that reflect,
 - **Null State.** Ad-hoc, unmanaged use of mobile computing
 - **Platform.** Mobility supported at the project level with platform specific capabilities. Project level capability resourcing, sharing.
 - **Managed.** Mobility is managed using MDM and similar capabilities
 - **Enterprise.** Enterprise-level capabilities and enterprise standards and policies. Platform agnostic capabilities.
- **Streams.** These primarily reflect the capability hierarchy, identifying the level of competency or the scope of the solution that might be expected for a given maturity level. In developing a maturity model an organization may also want to identify any industry sector specific streams that reflect the industry they operate in.

Stream	Level	Null State	Platform	Managed	Enterprise
<i>Scope of adoption</i>		<i>Individual</i>	<i>Project Pilot</i>	<i>Project</i>	<i>Enterprise</i>
Device Capabilities			Device Specific profiles	Device Agnostic profiles	
Mobile Device Management		Unmanaged	Device Specific	Device Agnostic Local MDM	Enterprise-common MDM
• Configuration Management			Device Specific	Device Agnostic Remote	
• Fault Management				Device Agnostic Remote	
• Asset Management			Tagged	Tracked	
• Content Management			Device Specific Vendor Cloud	Device Agnostic MDM function	Enterprise Cloud
• Device Life Cycle Management		Ad-hoc provisioning		Managed BYOD	Centralized



Stream	Level	Null State	Platform	Managed	Enterprise
Mobile Application Management		Unmanaged		Local Management	Enterprise Management
• Mobile Application Development		Web Applications	Device Applications Proprietary	Cross-platform Local MEAP	Enterprise-common MEAP
• Mobile Application Deployment		Downloads	Device Specific Vendor Application Store		Enterprise Application Store
Integration Mechanisms			Data Synchronization Messaging Services Public Cloud	Service Interfaces for enterprise resources Private Cloud	Enterprise Service Architecture Enterprise Services are 'mobile ready' Enterprise Cloud
Network Provision		Use of consumer network	Use of enterprise network		
Security Management		Application-level security. E.g. normal login to web Applications.		Remote wipe	Biometric identity
Governance					Enterprise Policies Enterprise Standards Mobile infrastructure enforces policy
Organizational Structures			EM Community of Interest	EM Centre of Excellence	EM Governance Board
Organizational Roles			Platform developer Project / Platform Architect Mobile Integration Specialist	MDM Specialist Mobile Infrastructure Specialist	EM Architect EM Governance Lead



Stream	Level	Null State	Platform	Managed	Enterprise
BYOD		Access to web applications	Device Applications can be used	Managed using MDM	
Reference Architecture				RA provides guidance Blueprints available	RA Compliance Blueprint Compliance

Table 6 – Outline Enterprise Mobility Maturity Model

Conclusions

Establishing the EMF is only part of the work that needs to be done to support Enterprise Mobility.

Key activities will include setting out the vision for mobility in the enterprise, and identifying the strategies for achieving it, and subsequently managing adoption and the roadmap to realizing that vision by provisioning the capabilities outlined in Table 6.

The EMF should provide a solid foundation for achieving these in a structured and consistent manner.

Further Resources

The following related resources are also provided for download

- Everware-CBDI Enterprise Mobility Capability Model [3]
- Everware-CBDI Enterprise Mobility Concept Model [5]

¹ <http://www.cbronline.com/news/us-joins-uk-with-near-50-smartphone-market-share-29-03-12>

² <http://everware-cbdi.com/ccrfam>

³ Everware-CBDI Enterprise Mobility Capability Model Download <http://everware-cbdi.com/emcap>

⁴ Capability Planning and Analysis. CBDI Journal October 2011. <http://everware-cbdi.com/index.php?cID=130&cType=document>

⁵ Everware-CBDI Enterprise Mobility Concept Model Download <http://www.everware-cbdi.com/emcm>



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CBDI Forum is the Everware-CBDI research capability and portal providing independent guidance on best practice in service oriented architecture and application modernization.

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