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Mobile Computing

A New Paradigm

When deploying mobile information systems for commerce and industry, businesses consistently ignore the fundamental adaptive attributes of the systems being developed, resulting in the implementation of inflexible mobile data systems¹.

The process of defining the business case for a mobile data solution and the undertaking of a requirements analysis, system design, development and deployment, can be a long, complex and high-risk project for any size of organisation. Problems continue when mobile projects are actually implemented,

PAUL BOUCHIER

with a multitude of factors influencing success or failure. The mobile software industry is littered with mobile system deployments that have either been shelved, or are unsatisfactory in their reliability and performance. There are a number of fundamental weaknesses in what can be described as the 'traditional' or purposive approach to developing mobile systems that must be addressed by a new approach and philosophy.

Multi-Vendor Supply

Mobile systems consist of a number of sub-systems:

- Mobile computers (PDA/hand held terminal/laptop) manufacturer
- Communications network provider
- Communications software or gateway vendor
- Mobile software supplier/developer
- Host system back office and systems integration services

In many cases these are separate companies providing their own component of a complex system. This complicates project management and also serves to impede fault resolution leading to a lack of ownership of problems when they occur.

Rapid Evolution of Technologies

The choice of communication networks and technology can be complex, with the most appropriate technology, vendor and tariff having to be selected through profiling the amount and type of data involved. Choices between mobitex, GSM data, SMS or any of the other networks need to be made, any mistakes in selection made here will be costly, as conversion to a new network technology and vendor in the future can be an expensive process.

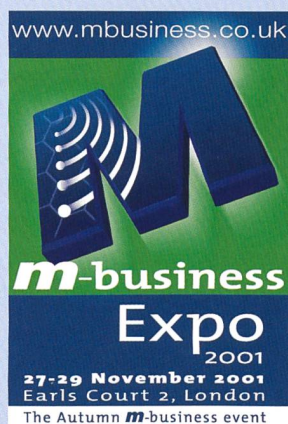
The inevitable hype surrounding new and supposedly superior mobile computing technologies results in "Techno Push", bringing to market new ideas for providing opportunities for businesses in improving their operations. However, this hype can also serve to inhibit and confuse the decision-making process.

The rapid reduction in the price of handheld terminals and the emergence of mobile operating systems such as Pock-

etPC™ and PalmOs™ on PDA type devices, has transformed the potential of mobile computing in terms of storage capabilities and processing power. Mobile devices vary from the highly ruggedised to the almost throwaway PDA. The overriding consideration when selecting hardware has to be that it is suitable for the type of environment the mobile worker is operating in. Again the wide choice now available can slow and confuse the decision-making process. Issues such as mean time between failures, battery charge and replacement life, screen durability and visibility, weight must be considered when evaluating suitable devices. This often, and correctly, involves lengthy consultations with the mobile workforce.

Mobile Software Development

Companies developing software for mobile devices either generally provide applications for niche markets, or bespoke applications for individual installations. There is also a wide-spread occurrence of software vendors delivering applications on particular hardware platforms. There are many instances where hardware platforms and software platforms are linked,



M-business Expo ISSE 2001 will be held on 27th - 29th November at the Earls Court 2, London, UK. This Expo focuses on the business benefits of wireless and mobile working. The show covers m-commerce, GPRS, mobile eCRM, remote internet/ intranet/ document access, navigation/positioning GPS, palmtops, laptops and handsets, mobile network service provision and network airtime.

Corporate visitors attend from industry sectors including field service, transport logistics, public sector, utilities, finance, retail, IT and communications. The event is co-located with e-business Expo 2001 www.ebizexpo.com

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¹ This article has been written as part of a series for m-business Expo, 27-29 November 2001, Earls Court 2, London, UK. For more information visit www.mbusiness.co.uk

either through legal agreements or through incompatibility with other platforms. This compromises the end users ability to pick the right application with the hardware of their choice, often tying the user into a particular hardware/software combination. When the software is a developed package the end user is forced to compromise both their business requirements and their choice of hardware platform.

Integration

When multiple vendors are involved in delivering a mobile solution, integration and compatibility become issues. Of equal importance is the consideration of integration into the user organisation's back office systems, this aspect of integration is often seen as complex and represents a major area of failure for the whole mobile system. Mobile systems must be tightly integrated into the organisation's management information systems as they are often business critical and have the potential to fundamentally change the operating characteristics of that business and its responsiveness to its customers and revenue generating capabilities. The integration should not only cover the dissemination and collection of data from the mobile devices, but should also tightly integrate the mobile workforce into the information flows of the company to enable better communication and management of the workforce.

Business Requirements Change

It is inevitable that business requirements will continue to change. From the defining of the business case for a mobile solution to its actual deployment will take several months, the longer the time scale the greater the probability will be that requirements will have altered.

The combination of changing hardware, communications technologies and business requirements, bespoke software development and integration issues spells one word to the decision-maker's and project manager's risk. To some extent the risks can be mitigated by good project management and trials of hardware and other components of the solution, however this would not alter the fact that technological and business environments are turbulent by their very nature.

The Adaptive Mobile Paradigm

With all the risks and uncertainty concerning mobile solutions, the question is

whether businesses should bother? The answer is yes as the potential reward for any business successfully deploying mobile systems can be significant. It enables information flows to be taken directly to the point of contact with the customer or revenue generation process, as well as delivering better customer service, communication and performance metrics for the business. The whole process of deploying mobile systems can be made far less risky, faster and reliable by adopting a holistic approach that explicitly recognises the turbulent nature of the environments being dealt with.

In order to overcome the limitations and risks of traditional mobile developments, the following principles should be followed when developing mobile software and in turn mobile systems for customers: Mobile system design should take into account a degree of adaptive planning and a recognition of changes that will take place in technologies and business requirements over time.

The systems and software should be designed to be open. Mobile application software must be able to be deployed on any hardware platform, enabling the user to intermix hardware in the same installation to allow older mobile device types to be swapped out for newer higher performance hardware when such technology is made available. Mobile software should have the capability to operate over different communications technologies and networks as required, again this is an explicit recognition that the costs and availability of communications networks will change in the future.

Mobile application software must be designed so that it is both parameter and data driven, whilst able to be re-configured from the central host system. This allows functionality to be changed as required by the business without recourse to the system vendor for software changes enabling the business processes to be changed rapidly, cheaply and at low risk. Additional advantages to this approach are that prototype systems can be tested quickly and cheaply, and that the architecture can support multiple mobile application requirements at the same time on the one mobile device. An enterprise wide view must be taken of mobile requirements. Mobile systems should be deployed as an infrastructure across the business enabling multiple business requirements to be supported in

the same mobile environment. The solution therefore must be designed as a scaleable, enterprise wide mobile software infrastructure system. The flow of data between mobile devices and host systems must be encapsulated within one system component to minimise points of failure and provide transaction integrity.

These principles lead to the development of an Adaptive Mobile Paradigm for delivering mobile solutions customers, thus enabling purposeful systems to be deployed rather than the limited existing purposive mobile systems whose scope for change is limited. Those companies who have the ability to change and manage their information flows quickly and cheaply are the ones who in the global economy will gain competitive advantage. ControlForce have adopted these principles in their m-Go™ software.

3

Paul Bouchier, *Technical Director of ControlForce Ltd.*

ControlForce

Founded in 1999 by a management and technical team with 30 years' experience from within the mobile data market, ControlForce is a provider of configurable mobile data solutions to support multiple vertical market requirements. Mobile data solutions are delivered through "m-Go(tm) Mobile Data", a fully configurable mobile application system. ControlForce is a Systems Integrator partnering with communications and hardware vendors to deliver total solutions to organisations who are looking to effectively connect their mobile workforce to existing systems. The company is based in Congleton, Cheshire, UK. ControlForce will be exhibiting at m-business Expo, 27-29 November 2001, Earls Court 2, London, UK. www.mbusiness.co.uk

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Zusammenfassung

Ein neues Paradigma

Wenn Unternehmen für Handels- oder Industriebetriebe mobile Informationssysteme entwickeln, schenken sie ihrer Eignung zur Anpassung und Nachrüstung keinerlei Beachtung. Die Folge sind statische Produkte. Für Unternehmen kann es, egal wie gross sie sind, zu einer langen, komplizierten und risikoreichen Aufgabe werden, den Business case für eine mobile Datenlösung zu entwickeln, eine Anforderungsstudie zu erstellen und das System zu entwerfen, zu entwickeln und einzuführen. Der ganze Prozess der Entwicklung von Mobilsystemen läuft schneller, gefahrloser und sicherer ab, wenn man einen gesamtheitlichen Ansatz wählt, der das wechselhafte Umfeld, in dem man sich bewegt, ausdrücklich mit einbezieht. Wer die Grenzen und Risiken der herkömmlichen mobilen Produkte überwinden will, sollte sich an gewisse Regeln halten, wenn er für Kunden Software für Mobilsysteme entwirft. Diese Überzeugung hat bei der Entwicklung des so genannten Adaptive Mobile Paradigma Pate gestanden. Es sorgt dafür, dass sich die Mobillösungen, die man den Kunden verkauft, den sich wandelnden Anforderungen anpassen lassen. Darum werden sich zuallererst jene Unternehmen Wettbewerbsvorteile sichern, welche die Fähigkeit haben, ihre Informationssysteme rasch und kostengünstig zu steuern und umzurüsten.

FORSCHUNG UND ENTWICKLUNG

Weisse Leuchtdioden als LCD-Backlight

Toshiba bringt einen winzigen Treiberchip heraus, mit dem die Helligkeit weisser LEDs gesteigert bzw. der Strombedarf gesenkt wird. Dieser Chip bereitet weissen Leuchtdioden den Weg als effizientes Rücklicht für farbige LCDs. Die Helligkeit der weissen LEDs liegt mit dem Chip 20% höher als bisher. Das bedeutet umgekehrt bei gleicher Helligkeit 20% weniger Stromverbrauch oder 20% längeren Batteriebetrieb für das Display. Anfangs will Toshiba monatlich eine Million solcher ICs bauen, zum Preis von 8 US-Cent. Das Chipgehäuse ist knapp $3 \times 3 \text{ mm}^2$ gross.

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Preiswerter kleiner Breitbandrouter

Einen preisgünstigen und kompakten Breitbandrouter für die Internetprotokolle IPv4 und IPv6 hat NEC auf den Markt gebracht. Der Übergang auf das leistungsfähigere Protokoll wird damit leicht gemacht. Der Router kostet nur noch knapp über 1000 US-\$. Dieser für den so genannten SOHO-Markt (Small Office Home Office) entwickelte Router bietet zwei 10BASE-T/100BASE-Ethernet-Zugänge. Das Gerät wiegt weniger als 1 kg und ist mit seinen Abmessungen $21 \times 22 \times 6 \text{ cm}$ erstaunlich klein.

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Kampf gegen Computerviren

Das Institute of Electrical and Electronics Engineers (IEEE), grösster Ingenieurverband der Welt, bietet seinen Mitgliedern eine zusätzliche kostenfreie E-Mail-Adresse auf seinen Servern. Diese Server werden von den jeweils modernsten Virencannern überwacht, mit einigem Erfolg: Allein im August wurden mehr als 35 000 Computerviren auf E-Mails ent-

deckt, die für Mitglieder bestimmt waren. Bemerkenswert wird die Zahl, wenn man heranzieht, dass es im Juni 2001 erst gut 5000 Viren waren, die man ausgefiltert hat. Es zeigt aber einmal mehr, dass selbst professionelle Ingenieure der Sicherheit ihrer PCs gegen Virenangriffe keine allzu grosse Bedeutung beimessen, wenn sie E-Mails versenden.

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Ein Display für Video auf dem Handy

Der Wunsch nach besserer Bildauflösung treibt die Handy-Entwickler, da mit den bisherigen Farbdisplays Videowiedergabe nur eingeschränkt möglich ist. Seiko-Epson wird in der zweiten Jahreshälfte 2001 ein nur 3,7 mm dünnes Farbdisplay auf den Markt bringen, das schon ein «Backlight» eingebaut hat und die Ansteuerchips in Chip-on-Glas-Technologie mit beinhaltet. Das Display verfügt über eine Auflösung von 262×144 Pixel, arbeitet normalerweise im RGB-Modus und braucht bei 30 Bildern pro Sekunde rund 5 mW an Leistung. Im reinen Textmodus sinkt der Leistungsbedarf auf 3,5 mW ab. Muster sind schon erhältlich, der Preis ist noch ein Geheimnis.

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Neuer Domain-Name für das Internet

Die Internet Corporation for Assigned Names and Numbers (ICANN) hat einen neuen Domain-Namen zugelassen, der gleichwertig neben den bekannten Namen wie «org», «com» oder «edu» steht. Die Bezeichnung «name» soll es Individuen leichter machen, sich eine eigene Website zuzulegen. Damit sollen die bisherigen Domain-Bezeichnungen entlastet werden.

Homepage:
www.icann.net/announcements