



The mobile print enterprise

How IT consumerisation is driving anytime, anywhere printing

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The consumerisation of IT, due in part to 'bring your own devices' initiatives, is accelerating the adoption of smartphones, tablets and other mobile devices in the workplace. Today's dynamic and mobile workforce is now relying on personal devices in their professional lives and expect anytime, anywhere access to corporate systems – including printing.

As the office extends to an ever-wider range of work locations and businesses find themselves supporting a diverse range of mobile platforms, the print infrastructure is extending to the mobile worker, improving both employee and business productivity. Even in the era of smartphones and tablets, businesses continue to rely on printing. Quocirca's research reveals that there is certainly the appetite for mobile printing, with almost 60% of respondents stating that their organisations would like to print from their mobile devices, with around 25% currently investigating mobile print solutions.

However, due to the diversity of mobile platforms and printer hardware, implementing an enterprise mobile print strategy is far from simple. Organisations face a complex array of hardware, software and service offerings, which vary both by mobile platform and printer device. Businesses cannot afford to ignore the consumerisation impact on enterprise printing. If they do, consumers will bypass IT and potentially use consumer printer apps which offer IT no real levels of corporate security or control on what is printed.

Clearly, the future of enterprise printing will increasingly be shaped by consumer trends. The extent to which organisations and vendors can harness this trend will determine success or failure. Organisations must balance a mobile print strategy with security, cost, business process requirements, user needs and delivery models.

This report highlights the market drivers for mobile printing in the business environment, discusses some of the main offerings in the market and suggests some best practices for building a mobile print strategy.

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Today's dynamic workforce is more mobile than ever before. The widespread adoption of smartphones and tablets, across Android, BlackBerry and Apple iOS platforms, has broadened the effectiveness of professional workers to remotely support business requirements. End users want to have access to desktop functions, for all business applications, on any device, anytime, anywhere – and printing is no exception. A continued reliance on printing amongst many businesses means IT must provide enterprise mobile printing capabilities that are secure and reliable. This not only ensures employees remain productive but also allows mobile printing to be tracked and controlled – vital in an era when many businesses face financial, environmental and security concerns.

The digital workplace remains reliant on printing	Despite the age of digital communications, many businesses continue to rely on printing to support business activities. As the consumerisation of IT accelerates smartphone and tablet usage in the enterprise and tablets become replacements for desktop and laptops, enterprise users will increasingly expect desktop-like printing capabilities from their mobile devices.
Mobile printing increases employee productivity	As printing shifts from the desktop to the mobile device, IT must extend their print infrastructure to the mobile worker. By providing the ability to submit a print job from any mobile device to any printer, securely and reliably, employees gain more flexibility and convenience to print on the move.
Mobile printing must be centrally managed	Mobile printing must be tightly integrated into an existing enterprise print management strategy to ensure costs are contained and security risks are mitigated. Print jobs from mobile devices must be subject to the same controls and scrutiny as those from the desktop, to ensure mobile print usage can be monitored and controlled.
The security risks of mobile printing must be addressed	Recent Quocirca research revealed that 70% of organisations have experienced one or more accidental data breaches through printing. Unsecured mobile printing can result in confidential information being left in output trays, exposed to prying eyes. This can be overcome through secure job release or 'pull-printing' which uses authentication to release print jobs and also maintains a full audit trail.
Lack of mobile printing standards has created a nebulous market	The market is characterised by mix of hardware, software and cloud-based printing services. The lack of standards and varying solutions means organisations are faced with a complex array of solutions. Approaches to submitting a print job include sending documents as an email attachment via a public or private cloud to a registered printer, submitting a print job through a web browser or direct printing over Wi-Fi.
Printer manufacturer solutions suit a standardised environment, ISVs offer solutions for mixed fleets	Most manufacturers offer a variety of mobile printing solutions for their own devices. HP, in particular, offers a broad range of consumer and enterprise mobile printing solutions through its ePrint portfolio which also includes support for Apple's AirPrint and Google's CloudPrint. For mixed fleets, third party solutions such as EFI PrintMe Mobile, provide mobile printing support across a multivendor environment.
Managed Print Services (MPS) contracts must encompass mobile printing to ensure full enterprise printing control	A managed print service can significantly reduce the complexity, cost and risk of unmanaged printing through a process of device consolidation and continuous management. This enables organisations to maintain control and ensure security of all printing, regardless of where it originates. While MPS providers such as HP, Ricoh and Xerox offer integrated tracking and reporting for desktop and mobile printing, Canon's uniFLOW is currently the only single print management platform for managing, securing and tracking print usage across the both environments.

Conclusion

The widespread adoption of smartphones and tablets, the growth of cloud computing and the increased need for convenience printing means that organisations must provide employees with a secure and simple managed approach to mobile printing. Unless organisations are ready to invest in mobile print-enabled printer hardware, they will need to implement mobile printing point solutions according to the capabilities of their existing fleet.



1. Introduction

IT consumerisation is now an unstoppable trend. The rapid proliferation of mobile devices is seeing more employees rely on their personal devices in their professional lives, with many organisations now supporting multiple mobile platforms such as BlackBerry, iOS and Android. According to the iPass Mobile Workforce Report published in November 2011, 91% of mobile workers use a smartphone for work with 44% of mobile employees owning a tablet device. The complexity of managing the wide variety of mobile devices in the enterprise is driving growth of cloud-based offerings as IT look to leverage alternative IT delivery and acquisition models. Mobile device proliferation, cloud computing acceptance and an increasingly mobile workforce are key trends that are today driving interest in mobile printing.

This dynamic and mobile workforce has increased expectations for the same access to corporate resources as they have from desktop devices – and printing is no exception. Even in a world of smartphones and tablets, printing remains essential to many business activities. Over half of respondents in a recent Quocirca survey indicated that printing is critical or very important to their business activities, signifying that, for many, the paperless office still remains tantalising out of reach. There is certainly an appetite for mobile printing, reflected in Quocirca's recent study amongst 125 enterprises. Almost a quarter of respondents are actively investigating mobile printing, with just 5% having deployed mobile printing – representative of a market still in its infancy.

As the office extends to an ever-wider range of work locations, and businesses find themselves supporting a diverse range of mobile platforms it is becoming crucial to extend the print infrastructure to the mobile worker. Organisations that ignore the impact of consumerisation on their print environment can leave their organisation at risk, as employees will bypass IT to use alternative consumer printing apps. These solutions may not offer sufficient protection and will also prevent organisations from tracking and controlling print usage.

Indeed, the risk of unsecured mobile printing cannot be overlooked. With recent Quocirca research revealing that 70% of organisations have experienced one or more accidental data breaches through printing, organisations need tighter controls on printing, particularly as mobile devices proliferate in the organisation. Using secure 'pull printing' can mitigate the risks of confidential information being exposed to unauthorised users by only releasing print jobs upon user authentication, such as a swipe card or PIN code, preventing printed output being left unclaimed in an output tray.

Many organisations are already addressing the complexity, cost and risk of their print environments through effective print management. They now need to take the next step to encompass mobile printing within their strategy to enhance employee and business productivity. This report highlights market developments in mobile printing, discusses some of the main offerings in the market and recommends some best practices.

2. Scope and definitions

Quocirca has included the following vendors in this study:

- Hardware vendors: Canon, HP, Lexmark, Ricoh and Xerox.
- Third party ISVs: Cortado, EFI, EveryonePrint, PrinterOn and Ringdale

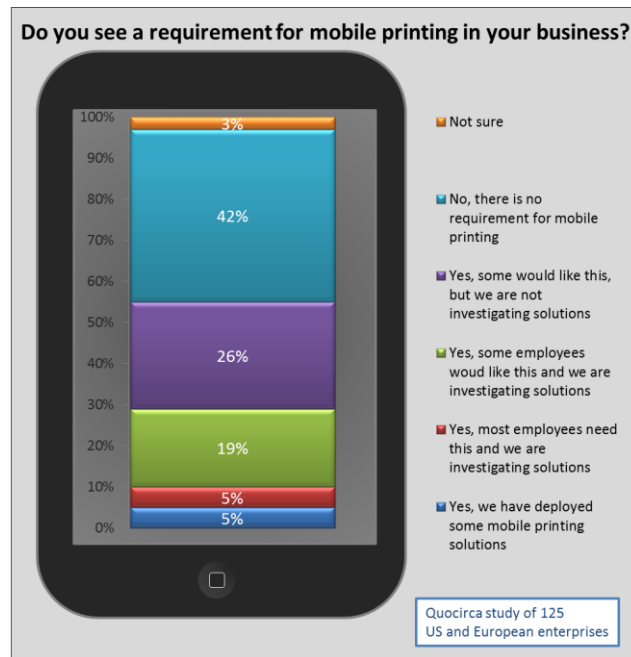


Figure 1. Interest in Mobile Printing (125 enterprises)



Each vendor completed a written submission detailing its strategy and solution portfolio. These submissions were followed up with vendor interviews. The report also references a recent Quocirca survey of 125 IT managers in the UK, France, Germany and the Nordic regions.

Quocirca uses the following definitions:

- **Mobile printing:** For the purposes of this report, mobile printing refers to print jobs submitted by business users via a mobile device such as a smartphone or tablet. Consumer mobile printing hardware and software is not covered in this report.
- **Cloud printing:** In a cloud printing scenario, print jobs are emailed to a registered web or cloud-enabled printer via a private or public cloud.
- **Pull printing:** Pull printing functionality allows a document to be released only upon user authentication using methods such as proximity/magnetic/smart cards or biometric recognition. Users submit jobs to designated pull-printing queues and jobs are moved from the pull-printing queue to the dedicated print queue. Pull printing enhances security and minimises wastage by ensuring print jobs are only collected by authorised users.
- **Managed Print Service (MPS):** This is the outsourcing of the print infrastructure through a process of assessment, optimisation and on-going management. MPS comes in many flavours, from entry level basic MPS packages that wrap hardware, service and supplies based on a cost per page contract, to more sophisticated enterprise engagements that include document workflow solutions, change management and continuous management, based on stringent service level agreements.

3. The market landscape

The widespread adoption of smartphones and tablets is certainly reshaping the printer market, providing hardware manufacturers with the opportunity to capitalise on the hardware, software and services opportunity. Not only is the demand for mobile printing an opportunity for more hardware sales – HP, for instance, shipped over 15 million web-enabled ePrint printers in 2011 – but it also enables vendors to capture pages as they shift from the desktop to the mobile device. In many cases these are ‘high value’ colour pages that generate additional revenue opportunities.

A fragmented market

Given the diversity of mobile platforms and printer hardware, it is unsurprising that the mobile printing market is fragmented, characterised by an array of hardware, software and cloud-based services. The mobile printing ecosystem is broadly populated by printer/copier manufacturers and independent software vendors (ISVs). (Figure 2)

- **Hardware manufacturers:** These vendors offer a mobile printing portfolio that comprises hardware, software and services. Printers may be cloud or web-enabled as in the case of HP’s ePrint or Ricoh’s HotSpot range of printers. This allows devices to be registered for these vendors’ respective cloud printing services. Most of the hardware-centric mobile print solutions are brand-specific, although some do offer multivendor support. Vendors that offer some form of mobile printing solution or service include Canon, HP, Lexmark, Konica Minolta, Ricoh and Xerox. Each varies in the completeness of their mobile print solutions portfolio. Hardware manufacturers such as Canon, HP, Lexmark, Ricoh and Xerox also offer mobile printing services as part of their managed print services (MPS) portfolio, enabling organisations to manage and track printing across both desktop and mobile environments.
- **ISVs:** These vendors include EFI, Cortado, PrinterOn and Pcounter, who all offer vendor-agnostic mobile print solutions. These are particularly suitable for organisations operating a mixed fleet, avoiding the need to implement multiple solutions for each mobile platform and printer or MFP. In many cases, hardware vendors will partner with ISVs to deliver multivendor support where appropriate. Google Cloud Print, currently in beta, offers printing from smartphones or tablets with Gmail for mobile, Google Docs for mobile and other supported apps to cloud-enabled printers. Google Cloud Print Ready printers register themselves directly with the Google Cloud Print service and these include HP ePrint and selected Kodak and Epson printers.
- **Operating system vendors:** Currently the only mobile platform to offer direct printing support is Apple’s AirPrint. This offers wireless printing from iPad, iPhone (3GS or later) or iPod touch (3rd generation or later) devices to AirPrint-enabled devices. These include selected printers from Brother, Canon, Epson, HP and Lexmark.



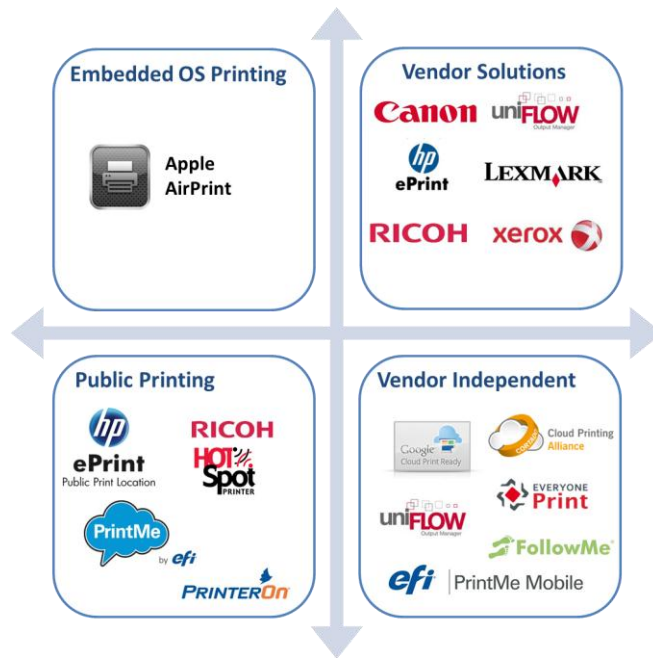


Figure 2: Mobile Printing Ecosystem (Enterprise solutions)

Usage scenarios

Mobile printing usage scenarios can be broadly categorised as:

- **Public printing/guest printing services.** Printing from a public printing “hot-spot” such as hotels, business centres, airports that offer Wi-Fi connectivity, web access and print and copy services. Mobile workers can discover printers or send print jobs as an email attachment from their mobile devices. Public print locations require an authentication code before users can release a print job from a designated printer. Print jobs are typically submitted via email or through a web browser. Examples include EFI’s PrintMe service which is available at more than 3,000 public locations, HP ePrint public print locations such as FedEx and Hilton and Ricoh’s HotSpot printing which uses PrinterOn’s public printing network.
- **Printing across a corporate network.** Printing from any device to any printer or MFP across a corporate network promotes user mobility across company locations. Printing may be direct from a mobile device or application, via an email attachment to a registered printer or through a web browser, using a public or private cloud. When deployed in the enterprise, it is critical that mobile print solutions are vendor-agnostic, use a private cloud approach and employ encryption and authentication methods to ensure document security and privacy.

There are a number of ways to print from a mobile device, although capabilities vary across vendor and mobile platform (Figure 3).

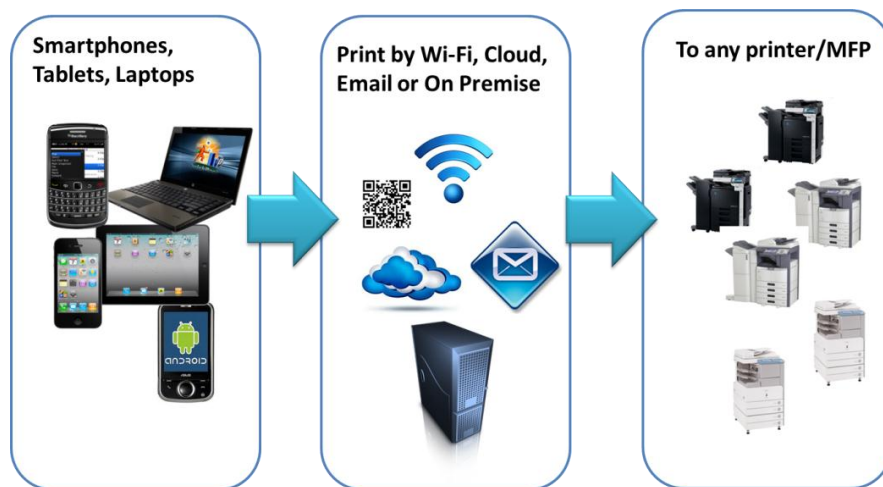


Figure 3: Printing from any mobile platform to any printer or MFP



- **Email or web browser:** This can use either a private or public cloud infrastructure depending on an organisation's requirements. A print job is sent to a printer's unique email address either by email or via a web browser. A limitation with printing via email is that content is constrained to what can be sent as an attachment and finishing options are not always available (e.g. duplex, booklet, stapling etc.). Web browser job submission may offer more flexibility on what type of document can be uploaded.
- **Wireless printing:** This is possible through two approaches:
 - Direct-to-printer wireless printing enables printing via a direct wireless connection between a mobile device and wireless printer without the need for access to a network. This requires either embedded OS print functionality for job rendering and routing (i.e. Apple AirPrint) or a mobile printing app. HP ePrint Wireless Direct Printing is one example and is supported on some of HP's LaserJet pro models.
 - Wi-Fi network printing solutions such as EFI's PrintMe Mobile enable printing via a Wi-Fi network connection to any printer connected to the corporate network.
- **Universal print driver:** A universal driver provides users and administrators with a single driver for multiple devices, simplifying driver deployment and maintenance. A universal printer driver is particularly suitable for a multi-vendor print environment.
- **QR code:** Some mobile print solutions such as those from Lexmark and Canon offer Quick Response (QR) code print job submission, enabling the user to scan a QR code attached to the printer to print.

4. Recommendations

Quocirca recommends that a true mobile enterprise print solution should integrate with existing enterprise print management capabilities. For end-to-end control of printing across both desktop and mobile environments, enterprises should consider a managed print service that can proactively manage and control enterprise-wide printing.

Capabilities to look for include:

- **Support for multiple mobile platforms.** Users should have the ability to submit print jobs via a variety of methods, such as via email, a web browser or a smartphone application. Investigate what document formats can be printed and whether driver settings can be modified to customise print jobs.
- **Print security.** Any mobile printing platform must offer secure job release features that are consistent with any access control and authentication methods used for desktop printing. Limiting access to printers and MFPs to known users is a crucial step in safeguarding confidential or sensitive information. The most common authentication mechanisms include passwords, smartcards, and two-factor authentication, such as a combination of a password and card access. MFPs can be configured to authenticate users against the organisation's corporate directory via LDAP (Lightweight Directory Access Protocol), LDAP over Secure Sockets Layer (SSL) or Kerberos. Authentication can be implemented by either using an external authentication server, using authentication features embedded within a device, or by installing software that works with the MFP on a PC or workstation. This form of access control is also known as 'pull-printing'. Look for solutions that offer auditing and tracking of print jobs across desktop and mobile environments to ensure a holistic view and control of all printing activity.
- **Multivendor support.** Hardware-centric solutions may of course be most suited to organisations operating a standardised fleet environment. However, in reality most organisations operate a range of printers and MFPs from different manufacturers. To address the need for mobile printing across a mixed fleet environment, third party solutions such as those from EFI should be considered. Quocirca recommends that organisations consider solutions that use a universal driver, enabling print jobs to be printed to any printer. This can also enable users to preview their print jobs and change finishing options before a job is printed.
- **Cost control and accounting.** Look for capabilities that enable restrictions and controls to prevent users from printing to more expensive printers, or exceeding print quotas. If such cost control and accounting is not integrated in the mobile printing platform, look for compatibility with leading cost recovery tools such as Equitrac and Print Audit.
- **Private or public cloud print services.** As corporate network access opens up, applications, storage, and infrastructure are moving to cloud computing environments. The shift towards cloud computing and the mobile consumption of information through applications such as Google Apps and Office 365 opens up wider opportunities to print, particularly as access to cloud-enabled printers grows. Enterprises and public sector organisations may prefer a private cloud deployment that lives within the firewall, to ensure the security of sensitive data. As many organisations



are now looking to hybrid clouds that blend the benefits of private clouds with public clouds, solutions such as HP ePrint offer both private and public cloud deployment options.

- **MPS.** The benefits of integrating MPS with mobile printing support should not be underestimated. A managed print service reduces the cost, complexity and risk of operating an unmanaged print infrastructure. This is achieved through a process of fleet assessment, device consolidation, implementation of document workflow tools and continuous management. If an organisation is using MPS and does not extend its coverage to include mobile printing, it is essentially opening its print infrastructure to escalating costs and security risks. Ensure that an MPS provider can provide integrated control of desktop and mobile printing. A strong offering in this area is Canon uniFLOW, a single print management platform, which offers integrated security and accounting across both environments.

There is no silver bullet for mobile printing, and organisations need to develop a policy framework that balances business value and risk mitigation. Those organisations already operating a managed print environment may find this process easier, as they can leverage the experience of their provider to determine how best to support mobile printing. For those organisations that are not using MPS, the task is more challenging and they should seek firstly to rationalise their existing fleet before introducing mobile print capabilities.

Conclusion

Whilst tablets will undoubtedly reduce the need for certain types of printed output, it is still unrealistic to expect the utopian ideal of the paperless office. Printing will continue to support business activities for some time yet, and organisations need to address and support mobile productivity by providing printing support across a diverse range of mobile platforms.

The shift towards the use of consumer mobile devices in today's fast-paced mobile workplace means IT managers need to ensure employees can access company resources through a variety of mobile platforms. The growing accessibility of cloud computing means many enterprises are turning to cloud-based services to improve flexibility and business agility. These key trends are driving interest in cloud-based printing services as organisations look to extend their print infrastructure to mobile workers.

The advent of managed print services (MPS) means that, more than before, the print infrastructure is more tightly controlled by IT, allowing the enforcement of policies and controls on what is being printed and where. However, the use of personal mobile devices and consumer cloud services for work activities is creating an IT headache as users' expectations on how they use their mobile devices in the office environment grows. Whilst printing may sit on the periphery of the IT infrastructure, left uncontrolled it is not only a huge cost drain – both financially and environmentally – but also a security risk. If mobile printing support is not offered, users will bypass IT completely and use unapproved and potentially unsecure consumer apps.

Incorporating mobile printing as part of an overall enterprise print strategy is the best way forward – this mitigates security risks and ensures that all printing is tracked, managed and controlled. Mobile print management is clearly an evolving practice, and Quocirca expects to see further developments in the market in 2012 as hardware vendors work to simplify and consolidate their offerings. Quocirca advises organisations to adopt and expand mobile printing capabilities today to support existing requirements and to prepare for the eventual broader adoption of mobile devices.



Further reading

Please note that this is an extract of Quocirca's full report on mobile printing which is available to purchase. Please contact Louella.Fernandes@quocirca.com for further details.

General information:

- Apple AirPrint: <http://www.apple.com/ipad/features/airprint.html>
- Google CloudPrint: <http://www.google.com/cloudprint/learn/index.html>

Quocirca Reports:

- MPS comes of age: <http://www.quocirca.com/reports/545/managed-print-services-come-of-age>
- Closing the print security gap: <http://www.quocirca.com/reports/624/closing-the-print-security-gap>
- Carrying the can – consumerisation and enterprise mobility: <http://www.quocirca.com/reports/605/carrying-the-can-consumerisation-and-enterprise-mobility>
- Taming the mobile tiger – grow resource effectiveness not management overhead: <http://www.quocirca.com/reports/516/taming-the-mobile-tiger>

Disclaimer:

This report has been written independently by Quocirca Ltd. During the preparation of this report, Quocirca has spoken to a number of suppliers involved in the areas covered. We are grateful for their time and insights.

Quocirca has obtained information from multiple sources in putting together this analysis. These sources include, but are not constrained to, the vendors themselves. Although Quocirca has attempted wherever possible to validate the information received from each vendor, Quocirca cannot be held responsible for any errors in information received in this manner.

Although Quocirca has taken what steps it can to ensure that the information provided in this report is true and reflects real market conditions, Quocirca cannot take any responsibility for the ultimate reliability of the details presented. Therefore, Quocirca expressly disclaims all warranties and claims as to the validity of the data presented here, including any and all consequential losses incurred by any organisation or individual taking any action based on such data.

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Quocirca is a primary research and analysis company specialising in the business impact of information technology and communications (ITC). With world-wide, native language reach, Quocirca provides in-depth insights into the views of buyers and influencers in large, mid-sized and small organisations. Its analyst team is made up of real-world practitioners with first-hand experience of ITC delivery who continuously research and track the industry and its real usage in the markets.

REPORT NOTE:

This report has been written independently by Quocirca Ltd to provide an overview of the issues facing organisations seeking to maximise the effectiveness of today's dynamic workforce.

The report draws on Quocirca's extensive knowledge of the technology and business arenas, and provides advice on the approach that organisations should take to create a more effective and efficient environment for future growth.

Through researching perceptions, Quocirca uncovers the real hurdles to technology adoption – the personal and political aspects of an organisation's environment and the pressures of the need for demonstrable business value in any implementation. This capability to uncover and report back on the end-user perceptions in the market enables Quocirca to provide advice on the realities of technology adoption, not the promises.

Quocirca research is always pragmatic, business orientated and conducted in the context of the bigger picture. ITC has the ability to transform businesses and the processes that drive them, but often fails to do so. Quocirca's mission is to help organisations improve their success rate in process enablement through better levels of understanding and the adoption of the correct technologies at the correct time.

Quocirca has a pro-active primary research programme, regularly surveying users, purchasers and resellers of ITC products and services on emerging, evolving and maturing technologies. Over time, Quocirca has built a picture of long term investment trends, providing invaluable information for the whole of the ITC community.

Quocirca works with global and local providers of ITC products and services to help them deliver on the promise that ITC holds for business. Quocirca's clients include Oracle, Microsoft, IBM, O2, T-Mobile, HP, Xerox, EMC, Symantec and Cisco, along with other large and medium-sized vendors, service providers and more specialist firms.

Details of Quocirca's work and the services it offers can be found at <http://www.quocirca.com>

