

NHS Mobile Working with RiO™ Electronic Care Records - Trial Findings

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The deployment of electronic care record systems offers great benefits for Patients, Clinicians and PCTs, but simultaneously this also creates new challenges. For community based clinicians, principal amongst these is how the systems can be accessed when working away from clinics and offices? In parallel, the demand for greater productivity and delivery of enhanced services means solutions which provide the ability to work more efficiently is ever pressing. Recent in-depth studies sponsored by Dell™ and Intel® have demonstrated that the introduction of mobile working can play a significant role in addressing both of these challenges.

The challenge

Having identified the potential of mobile working in Community Healthcare, in 2006/7 Dell together with Intel commenced a programme of fully monitored trials in Nottingham and Lincolnshire. To gain a broad perspective the trials incorporated multiple different clinical services, working in different geographic areas from rural to city centre based, and were independently monitored and analysed by Ignetica Ltd. The conclusions clearly demonstrated the compelling business case and wider patient, clinician and Trust benefits that mobile working could provide.

Within London however some queries remained: What would be the implications when working in a metropolitan location with different transport facilities and practices? Would there be issues using mobile working with CSE Servelec's Electronic Care Record system RiO™, and for trusts which may not yet use the full functionality

of the RiO system, would mobile working help or hinder the rollout process? As a result, what would be the consequential impact on the business case and critical success factors for deployment?

The Response

Recognising this challenge, in 2008 Dell and Intel sponsored a further six month programme to assess these aspects in a trial with London's Hammersmith and Fulham Primary Care Trust. Commencing in January with user workflow analysis and trial systems planning, the trial led to a nine week monitored field trial involving six users representing Health Visiting, School Nursing, District Nursing and Community Matron Services. Throughout the trial, users' experiences were independently monitored, and the results analysed and evaluated by Ignetica Ltd.

The trial provided all users with full online, real-time access to the RiO Electronic Care Record system, email and all other normal applications normally available in a 'fixed' location. Users were equipped with Intel based Dell notebook PC with Vodafone 3G/HSDPA mobile data connectivity and a secure key fob system. Using these devices they were able to securely access the trust network (via an existing Cisco VPN) for remote desktop/terminal service access to the required core applications.

Summary of trial results

The conclusions were clear; even in early stage deployment, for most clinical groups, mobile working provided an immediate net benefit with a compelling economic case, and yet, as this paper highlights, this is just the start of the potential.

Across all users an average of 39.4 minutes per day was saved or released for productive use. When the value of this time is evaluated, less the fully absorbed costs of the system (revenue costs, capital depreciation/leasing of c£30 per month) an average economic value of £268 per user, per month could be realised. In addition to these direct operational and productivity benefits, the trial also demonstrated significant patient, clinical and user benefits. Whilst the productivity gains alone provide an immediately compelling business case, even greater

advantage and economic value may be realised through the wider patient, user and organisational benefits that mobile-working enables.

Enabling Transactional & Transformational Change

From the outset, mobile working provided trial users with immediate benefit through the ability to access patient records from remote locations wherever and whenever required. Where previously clinicians had to wait until they returned to an office to update their notes (or physically take paper care records to appointments with the attendant security and accessibility issues), mobile working provided direct access without geographic or time constraints. In particular by avoiding additional visits to offices or to return to patients after collecting their records, significant travel time could be saved, along with the further advantage of avoiding the backlogging of tasks which could previously only be processed in a clinic or office.

Embracing the ability to access information systems at any-time and in any-location, many users were also able to rearrange their working practices for improved productivity. Prior to mobile working, clinician's activities were frequently restricted by physical location preventing access to data and impeding their ability to achieve effective time management.

What is RiO?

CSE Servelec's Electronic Care Record system, RiO, is a web-based integrated care record system supporting paperless clinical records, health promotion & screening, and care administration. It has been designed for use in Primary Care, Mental Health and Children's Services as well as other social care organisations.

Further details on RiO can be obtained from CSE Healthcare's website www.cse-healthcare.com

With mobile working these activities could be moved to different times in the day, significantly enhancing efficiency. An example of this is the requirement to report to an office location each morning to check the day's appointments, print records for the patients to be visited and action any emails or RiO notifications, before visiting patients. With mobile working, clinicians could (policy permitting) access this information from home and then travel directly to their patients, resulting in significant time savings. Similarly, where previously they may have had to return to base to complete their notes, mobile working enabled clinician's to complete this remotely reducing travel, improving flexibility and work/home balance.

Some of these benefits could not be enjoyed by all trial users due to existing management practices, for example requiring some teams to report to the office at the start of the day. It is clear however that when the potential benefits are seen, adaptation of such policies and practices could, where appropriate, be adopted and wider change embraced.

Supporting RiO Deployment

One of the key questions posed at the start of the trial was how effective mobile working would be in instances where the full functionality of RiO may not yet be in use and, in these circumstances how would mobile working impact the deployment process? With a high proportion of the trial user group using RiO primarily for contact and caseload management rather than full care records this was fully tested. The trial found that not only were immediate benefits accrued in these instances but the deployment of mobile working could significantly increase the ability and motivation of users to deepen their usage of RiO. In particular where clinicians were able to access the system at the time, and in the places they needed, the benefit of having the full

patient record available on RiO (rather than in paper form) was greatly improved.

Nearly 40 minutes released per user per day

Even within the context of the trial, and with further benefits being realistically attainable in full rollout, the results were considerable. Whilst the average time saving of 39.4 minutes per user's working day was very significant, for some this reached over 55 minutes per day even within the trial setting. Time savings were achieved both through reduction in travel and as a consequence of the individual efficiencies enabled by mobile access to RiO and other office applications. The time released through the later was on average 21.1 minutes per user/day with significantly greater scope for larger efficiencies in post trial deployment also being identified. The average travel time savings was 18.3 minutes per user working day, but with this ranging from 0 to 45.6 minutes. The wide range of user results reflects the absence of travel savings for those services where the combination of travel locations and management practice continued to require attendance at base at the beginning and/or end of the day.

Moving to Rollout

Perhaps the most significant conclusion from the trial programme has been that of HFPCT which, based on the findings has now commenced the phased full rollout of mobile working within the trust using Intel® Core™ 2 Duo, Dell E4300 notebook PCs

Detailed Trial Findings

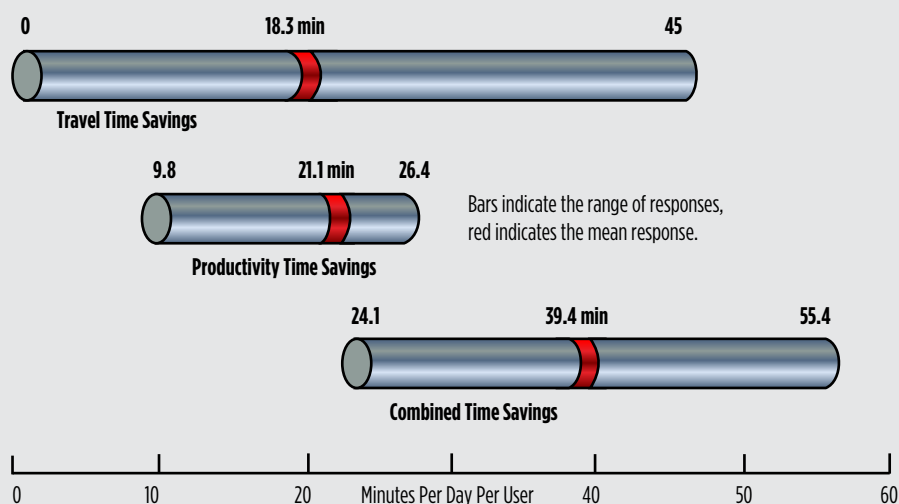
By design, the study included trial users from a range of different clinical services, each with different requirements and current levels of RiO usage. This approach enabled the assessment of mobile working within different clinical, operational and systems settings to ensure a broad based assessment could be established: Health Visitors (HV), School Nursing (SN), District Nursing (DN) and Community Matron (CM) services were all represented in the trial. Though not exhaustive this range of services is likely to represent a broad spectrum of requirements seen in community care.

Although there were many areas of common benefit, there were also significant variations in the way in which different groups were able to harness mobile working - particularly in terms of its use with patients. For some groups, use with patients was highly beneficial whilst for others, either due to the nature of their patients' needs, physical space or other constraints this could be less so, either in general or based on the nature of the patient visit.

In District Nursing for example if a new patient assessment (taking considerable time with lots of information requirements) was being performed, direct entry of the information during the assessment was appropriate and beneficial. Conversely if a DN visit was to replace a dressing where the information update requirements would be small, then there may be little benefit accessing the system at the time, particularly when the overall appointment time may be short.

A consistent aspect of usage across all user groups was the ability to access information at the point of clinicians need, regardless of location or time. Whilst use in patients' homes was of regular benefit for some, being able to access information in other locations including from (clinician's) homes, whilst travelling and in other remote locations, was a consistent benefit for all. Indeed although it may be intuitive to consider *clinical mobile working* as synonymous with mobile access at the point of care (i.e. with patients), in community care it may be better described as at the point of need.

Time saved or released by trial users (average over trial period)



94 user days over a 9 week trial involving 4 clinical services, n=4

Beyond the inherent differences in clinical workflow and information requirements associated with different patient interventions, the other key variable influencing the level of mobile working utilisation was the management practices/norms within the clinical service. Approaches developed for traditional paper based information exchange, such as all team members reporting to a set office location each morning to access notes before commencing patient visits were logical and appropriate. But with mobile working releasing clinicians from the need to physically exchange data (paper) new approaches may be developed releasing some of these requirements. Other than where equipment needs to be collected and/or where other supervision/team interactions are involved, it may be possible to remove the need to report to an office at the beginning and end of the day. Within the context of a nine week field trial some services were not able to deviate from the existing model and as a result the morning and/or end of day travel savings could not be enjoyed, but for those who could, the time savings and productivity gains were very significant. With larger scale deployment and appropriate support to adapt from the existing practices, it is clear that greater travel time savings could be achieved.

Another aspect which may require consideration when evaluating/deploying mobile working relates to home working. Linked with the above, the ability to work from home using mobile working in appropriate situations (such as checking appointment details, before setting off to visit patients) can generate significant time efficiencies. Such changes of course need to be considered in the full clinical and operational context and with an awareness of other influencing factors. For example, during the trial some clinicians reported a concern that their colleagues may perceive them to be less

hardworking if they were to partially work from home. Again, these factors restricted some of the measured benefits during the trial, but they simultaneously highlight the further benefits available in full scale rollout with appropriate change management support.

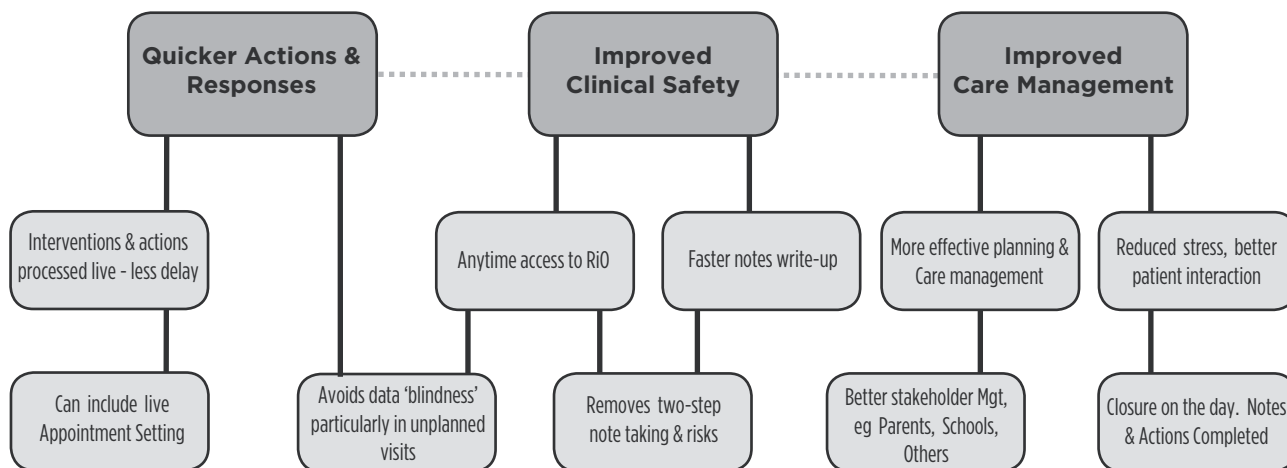
Despite the variations by clinical service, there were also broad areas of commonality in the wider benefits which could be realised in terms of *Patient/Clinical*, *Operational* and *User* benefits as described below.

Patient & Clinical Benefits

As well as delivering operational benefits, the ability of mobile-workings to provide online, real-time access to their core systems can also enhance clinical safety and the quality and speed of care interventions, resulting in an improved patient experience.

Having online access to the most up-to-date notes at the point of care has clear safety benefits and helps ensure properly informed decision making. In the case of unplanned visits or information requests, having mobile access to electronic records can help clinicians avoid the dilemma of either working without access to the latest information, or introducing delay while they return to a base to locate the necessary notes.

The clinical and patient benefits of mobile working



With mobile working clinicians can access the necessary information where and when they need it, providing of course the notes are recorded on the system. Due to the level of RiO usage at the time of the trial, this was not always the case. However, users reported that the anytime access to notes provided via mobile working created the incentive to ensure records were recorded and held in electronic form. Several of the users who previously continued to use paper based records started recording notes electronically within RiO as a result of the benefits mobile access provided.

As described earlier, some clinical services used mobile access directly with patients. In addition to the operational benefits, this has also created patient benefits in particularly in terms of information sharing.

A frequent example involved clinicians accessing online information relating to their patients' conditions, support arrangements and equipment during appointments. There is also the potential to jointly review notes and test results online for increased patient participation in their care where of course the facilities are used within RiO.

Clinicians have further reported that with easier and more frequent mobile access to data they have been able to use this to help them maintain and review their patient care plans to a greater extent than prior to mobile working. The combined benefit of accelerated care interventions combined with the ability to plan and coordinate patient care more effectively can have a significant positive impact on the patients' experience.

Operational Benefits

The introduction of mobile working creates the potential for clinicians individually, as service teams and cross-service teams through to the PCT as a whole, to work in new ways which improve efficiency, effectiveness and speed of response.

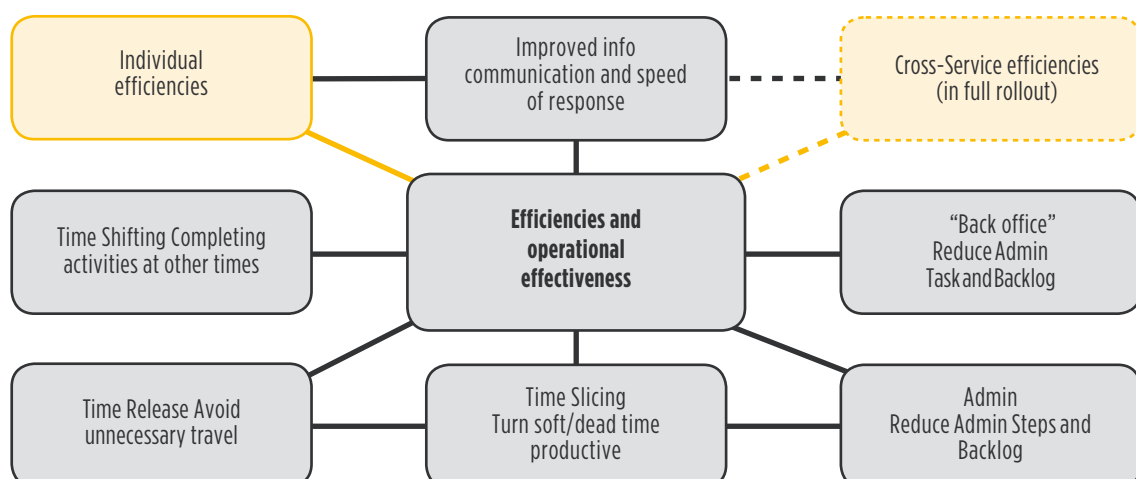
Within the context of a trial with limited numbers of users the full extent of these benefits could be realised, but the potential for wider team and cross-service efficiencies could be clearly identified. Within the scope of the trial, therefore, the principal measured benefits relate to *individual* efficiencies alone. It is important to also note that even these individual measures, though very significant, could, with wider scale deployment and greater change enablement increase yet further.

As shown in the diagram above, overall efficiencies and effectiveness gains can be generated from a range of different elements. One of the most striking impacts is the way in which mobile working enabled individuals to

maximise their own productivity, particularly with respect to the release and use of time. These aspects can be considered as *Time Release* (avoiding activities which are no longer required), *Time Slicing* (converting slices of formerly soft or dead time to be productive) and *Time Shifting* (enabling activities to be moved within the day to more convenient times, rather than being controlled by fixed access to information).

The most significant **Time Release** aspect is the reduction in the time spent travelling to and from offices purely to collect, return and process information. Across all users the average travel-time saving (excluding commuting) was 18.3 minutes per day, but as noted above for a significant number, current management practices prevented realisation of these savings thus reducing the average saving. As such typical savings of closer to 30 minutes per user day may be expected. Even within the constraints of the trial, one clinician averaged 45 minutes of travel-time release per day.

The operational benefits of mobile working



In addition to these savings, where is it appropriate to work from home at some stages of the day, (for example, to check the day's appointments before proceeding directly to patients, or writing up notes rather than returning to the office) commuting time savings can also be achieved. Although such commuting time savings may not generate direct cost reduction for the PCT, they can have a highly beneficial user impact which may in turn provide indirect cost savings. Of course the extent to which working from home can be advantageously incorporated into work practices also needs to be considered in the wider context of effective overall team communication and supervision. Mobile use of RiO and the greater depth of real time information available can support both of these aspects, but the use of informal office time as well as formal team meetings can of course also be important for exchange of information as well as appropriate team supervision.

The second notable time impact was converting small slices of formerly unproductive time to become productive. This **Time slicing** effect had multiple examples but frequent instances included times when patients did not attend appointments, time planned as 'soft' or contingency time between appointments or other brief gaps in the day, which could now be used to access systems and work productively.

Freed from the constraint of having to access systems in fixed locations, clinicians found they could start to rearrange their days for greater productivity. **Time Shifting** or moving activities to more efficient times in the day was seen in situations such as completing administrative processes at peak-traffic times and moving travel into off-peak times. For some users, the greater flexibility this enabled (when duly authorised) an improved work-home balance with, for example, some activities being undertaken in an evening

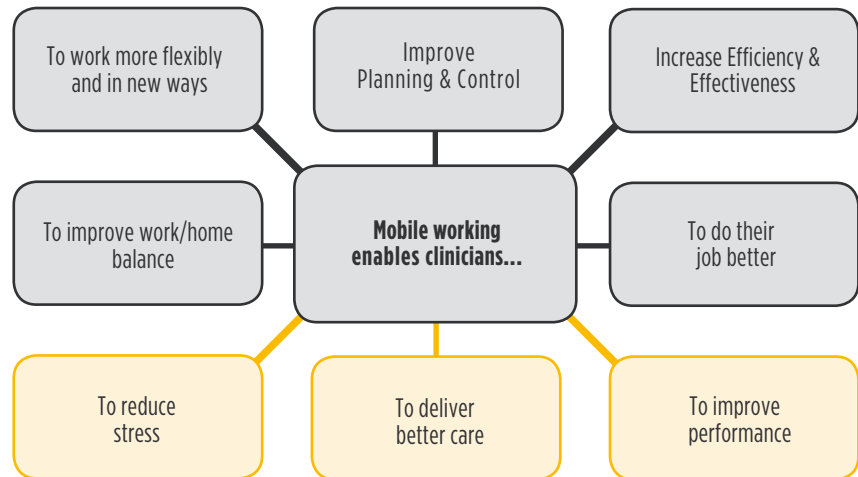
so that greater flexibility to cater for home-life commitments could be accommodated.

Faster intervention processing: Prior to mobile working an intervention request may not be processed until the clinician returned to their base. With the addition of an accumulated backlog of such tasks, in non critical cases, delays could extend to several days after the patient's appointment. With mobile working, more frequent and location independent access to RiO, email and other applications enabled clinicians to process interventions more rapidly - frequently during or directly after the appointment. Although individually this was advantageous, when multiple users have mobile access it is clear that the combined impact could be even greater. Currently if the recipient of the intervention request is also away from base, it may not be until they also returned to their office and cleared their request backlog, before this could be processed. The combined delay of making and receiving the request can therefore easily extended over several days, whereas with mobile working this can be reduced considerably.

The avoidance of a backlog (of work to be processed when the clinician has access to their information systems) also has significant positive stress reduction benefits and offers potential benefits for back-office and administrative areas. For example, in some instances it was possible for clinicians to directly book follow-up appointments during the patient appointment thus avoiding a subsequent administrative requirement whilst also improving the patient experience.

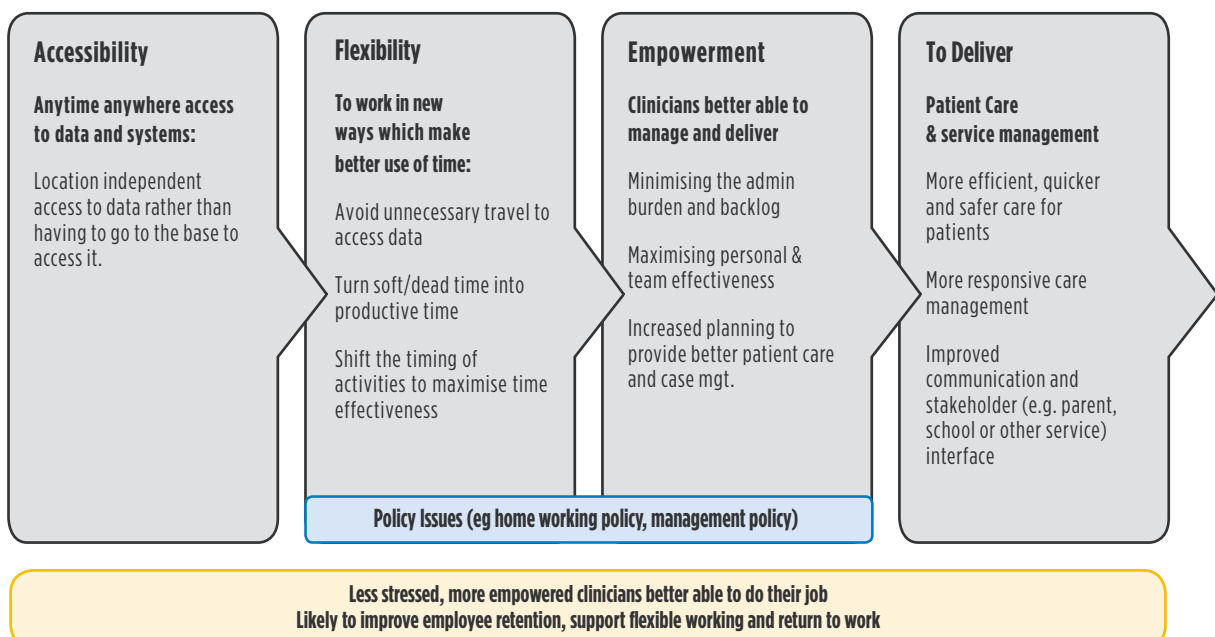
User Benefits

The trial users' feedback demonstrates that mobile working enabled them to work in new more flexible ways which can increase efficiency and effectiveness. As a result, particularly when the full facilities of the RiO system are used, clinicians felt better equipped to perform their job delivering care. Through the enhanced capabilities, plus the reduction of backlogs and process duplication, users also reported that they felt less stressed in their jobs. Indeed where management practice permits, the ability to work more flexibly can also contribute to an improved work/home balance. Although not within the scope of the trial it is reasonable to assume that the result of reduced stress and improved work/home balance could improve staff retention and reduce stress related absence.



Enabling Users

The trial has clearly shown that users are enabled through a chain of capability enhancements facilitated by mobile working. Each of these not only provides a benefit in itself, but also combines with the others to achieve a significant overall enhancement in service delivery.



From being able to access data at any time and in any location, through to using mobile working to enable more effective working practices, the benefits experienced during the trial are numerous and compelling - and the indications are that these could be even greater in an operational deployment.

Enabling Change

The trial programme has convincingly demonstrated that where authorised, users are quickly able to adapt, streamline and enhance their methods of working even within the constraints of a trial. In permanent deployment in which full clinical services are enabled with mobile working, and where wider changes in operational management and policy issues can be implemented, further benefits can be anticipated. A longer term approach would also enable the best practices developed by individual users to be identified and incorporated for wider adoption.

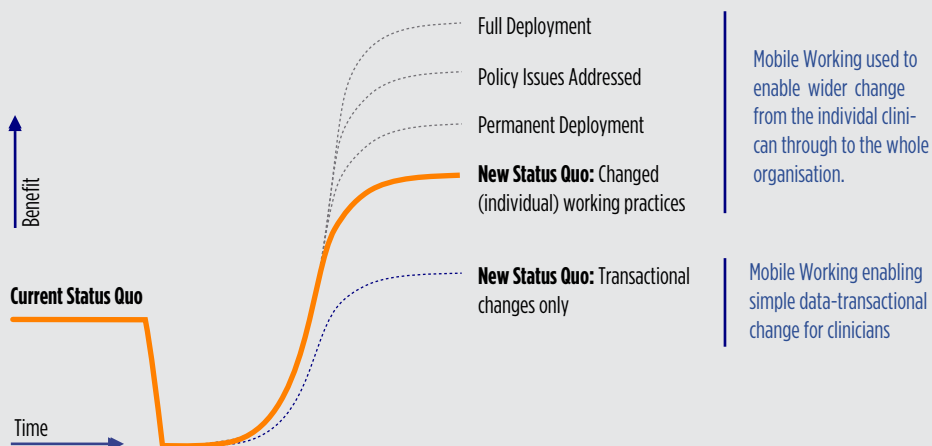
Although medium-term working practice enhancements will enable organisations to derive maximum advantage from mobile working, these

changes are unlikely to happen without focused support. Appropriate change management to facilitate this process is therefore likely to be a key factor in supporting the rapid adoption of mobile working and the ultimate realisation of its full potential.

As illustrated in the diagram below, the extent of the benefits derived from mobile working are likely to vary significantly based on the degree to which the potential for change is embraced. Whilst the transactional benefits alone provide a compelling business case to justify investment in mobile working for most PCTs, simply making mobile working technology available will not in itself ensure that the higher order transformational benefits are realised.

Effective analysis of the current situation, objectives, drivers and influencing factors is essential to understand the change requirements and the potential impact of mobile working. By combining this insight with the knowledge and methods which trial users have found to be most effective, a tailored programme to support highly effective deployment of mobile working can be envisaged.

The change impact of mobile working under different scenarios



Assessing the Business Value

With an average of 39.4 minutes per day saved or released across all users, the time saving impact of mobile working is extremely clear. Is it equally clear that there are further benefits in terms of staff satisfaction, patient safety, patient access and overall efficiencies and cost optimisation which should not be overlooked: Within the scope and duration of this trial although these aspects could be identified, the measured and evaluated benefits relate to individual staff productivity alone.

Economic Value of Time Savings/Increased Productivity

The trial users were primarily pay scale bands 6, 7 and 8. On a prudent basis, for all time value calculations an average user salary in the mid point of band 6 with inner London weighting allowance has been assumed. National Insurance and the standard Trust overhead loadings were added to this total from which the cost per hour was calculated using the standard RCN calculations. On this basis the cost to the Trust of a typical band six clinician is £23.70 per hour, with this ranging up to £33.26 for a Band 8a employee. Using the lower figure as a conservative representation for the trial and with an average 39.4 minutes saved or released per day, the economic value of this time can be calculated at £298 per month. For completeness of analysis, if the full range of time savings from the lowest 24.1 minutes to the highest 55.4 minutes per day is also calculated the economic value ranges from £182 to £419 per month.

Cost of the Mobile Working Solution

The mobile solution used for the trial included a well specified Dell D430 notebook PC with an embedded Vodafone 3G/HSDA modem. In

addition to the capital costs of the hardware, a Vodafone mobile data service contract was required along with a VPN token for secure log in. The PCs were specified with three year next business day support from Dell and on the basis these would replace existing desktop PCs no additional internal support costs were envisaged by the PCT. Similarly on the basis that the VPN was in place no additional costs were accrued.

All capital costs were depreciated on a three year straight line basis with the assumption of no residual value after 36 months use.

Using the above approach the typical cost per month (combining revenue, lease and depreciation costs) was £30 per user. Adding a docking station, 19" ultrasharp TFT monitor, PSU, keyboard and mouse increased the cost to £37.50 per month. For 'power users' who may require more than 3Gb per month and the full docking solution the cost would increase to £40.40 per month with unlimited mobile bandwidth.

Net Economic Value

With an average economic value of the time saved per user at **£298** per month and typical cost per month per user of **£30** per month, the net **£268** economic value released per month clearly represents a compelling case. Even for power-users with £40.40 per month costs, the benefit is only marginally reduced. With the value of the time saving/released ranging from £182 to a highest of £419 per month, it is also clear that even for users deriving lower level benefits the economic case remains compelling.

As illustrated throughout this paper, in full scale rollout with appropriate change management support the anticipated results are likely to be greater than those measured in the trial. Equally the further benefits identified but not quantifiable within the trial setting would also be realisable. As shown in the table below, using the Intel Business Value of IT (BVIT) value-dial framework it is clear that these additional value drivers could become very significant on full scale deployment.

Value Dials	Example Performance Indicators	Measurements or Observations
Patient Safety	Instant accessibility of records at the point of need	Mobile access provided online access at the point of need subject to the data being on the system
	Reduced incidents of clinical errors due to information errors and associated costs	Not within the trial scope, but clear potential in this arena due to secure accessibility of notes and avoidance of potential paper based transcription errors.
Quality of Care	Response time to action interventions or enquiries	Clear benefits identified in the trial
	Avoidance of unnecessary admissions	Not within the scope of this trial, but clear potential to reduce instances of admissions when the full patient care record is available and information more easily shared.
	Clinician time planning care or with Patients	Through increased accessibility of records, trial users were able to spend more time planning and reviewing patient care.
Patient Access	Waiting time for Interventions and clinical enquiries	Trial users identified the ability to process interventions and enquiries more rapidly when mobile working was available.
	Availability of Information at the point of Care	Where used in the RiO system, observation trend information (eg BP), as well as information regarding condition management can be shared online with patients.
	Waiting times for follow-on appointments	In some instances, follow on appointments can be arranged by the clinician during the existing appointment - improving the patient experience and reducing further admin.
Staff Productivity	Individual Productivity/Efficiency	On average across all trial users, 21.1 mins per day was saved or released based on the use of mobile working through individual productivity gains
	Individual Productivity/Travel Reduction	On average across all trial users, 18.3 mins per day was released through travel time reductions using mobile working
	Overall Team/PCT Productivity	The trial has demonstrated the potential for further productivity gains when deployed on a wider scale and/or permanent basis with appropriate change management
Staff Satisfaction	Overall Staff Satisfaction	Trial users indicated they felt enabled by the increased flexibility and capability provided by mobile working may lead to improved overall staff satisfaction.
	Overtime Hours	Mobile working released close to 40 mins per user working-day. This time may be used in different ways, but one option could be to reduce overtime.
	Commuting time and Costs	Subject to management approval, mobile working can radically change the profile of home-office commuting with direct benefits for staff and indirect benefits for PCTs.
	Staff turnover & Absenteeism	With increased flexibility and reduced stress, improved staff satisfaction may result in reduced staff turnover and stress related absence in the longer term.
Cost Optimisation	Travel and related out of pocket expenses	Reduced travel could reduce the associated expenses: In London with most transport being fixed cost (eg Oyster card or walking allowance) no direct saving was identified.
	Reduced duplication due to incomplete information	Incomplete care-records could result in different clinicians requesting duplicate tests or other interventions (with duplicated costs) mobile access could reduce this.
	Reduction in administrative costs per patient	The ability to process some administrative process at the point of care can reduce back-office tasks. In larger scale deployment there is scope for further change.

Assessing the technology

Having the right technical solution for mobile working is essential: If the system does not meet the requirements of users, if it is unreliable or otherwise burdensome, users will quickly turn against it creating an insurmountable barrier to deployment. Although it is clear that effective organisational change management is essential to harness the full potential of mobile working, unless the technical solution provides the correct platform even basic use will be limited. Deploying the optimum user solution is therefore essential, and this can be further enhanced when the solution is tailored to the specific needs of different clinical groups.

For the trial, Intel® Core™ 2 Duo based Dell Latitude D430 notebooks were deployed. These highly mobile (1.36kg, 295x209.8x25.4mm) devices were selected to provide the best blend of performance, workable screen size (12.1") and weight. Each had an embedded 3.5G/HSDPA wireless data card for seamless wireless mobile networking. The network communications were provided using the Vodafone 3.5G/HSDPA wireless data network with secure access to the trust's network via an existing Cisco VPN.

Ensuring Security

Security of patient and indeed any data on the user PC was a critical theme. In addition to the secure VPN and multiple logon tiers, security was further enhanced by the use of Microsoft™ Remote Desktop Services (terminal services) functionality. Using this approach the application and the data remained on the central terminal server with no actual data (other than keystrokes and screen updates) being transferred to the clinicians' (client) PCs.

In addition to the technical security provisions, the use of online remote access to notes also avoids the need to transport paper records to appointments and thus reduces the risk of loss or theft. Of course the use of online records also ensures that in the event other clinicians require a patients' notes they can also access them rather than the data being closed to them when hard-copy notes are physically removed.

Active Monitoring

Throughout the trial via day diaries, telephone interviews and a post trial questionnaire, users' experiences as well as perceptions of their mobile PC, the network connectivity and overall use of the systems was monitored. Operating issues were identified, and in many cases addressed through discussion with the Trusts IT personnel or carried forward for onward review. Using this approach a broad and inclusive picture of the practical operation of the mobile working solution could be established along with the quantitative assessment of the productivity impacts.

Equipment Rating

The trial users' feedback was positive with their PCs being well received and rated in terms of ease of use, performance, size and weight. From the post trial questionnaire users average usability rating ranged from was good to very-good and overall PC speed was rated as good (on a scale of very poor, poor, okay, good and very good).

Battery life for clinicians who may be using their PC throughout the day is of course always a challenge and this resulted in a wider spectrum of responses. The use of the terminal-services

connectivity also created some additional challenges in terms of battery management. Using the remote desktop approach the screen viewed on the clinicians' Notebook PC was actually that of the terminal server rather than the PC itself. As such low battery warning icons which would otherwise have been displayed could not be seen, and thus limited warning of low battery charging was provided. Users however learnt that there was also an LED indicator in the actual battery so that they could assess the remaining charge. Since the trial the introduction of the latest Intel processor in the newly launched Dell Latitude E4300 notebooks (which have now replaced the D430 used in the trial) has even greater battery life with clear advantages for high intensity users.

Connectivity Rating:

The 3.5G/HSDPA network connectivity worked well with good signal strength and overall speed. The average rating of mobile network coverage was 'good' with the range of responses spanning 'okay' to 'very good' - the highest option available. Inevitably there were some areas of weak connectivity and frustratingly this included two centres used by the Health Visitors which adversely impacted their assessment. In general however, users quickly found the areas where they had good connectivity and avoided using the system in areas where they knew the reception to be poor.

Multi-stage logins (for example PC login, VPN login, terminal services login and application login) provided a high level of security but also led to a longer and more burdensome process for clinicians. As a result the average user response rated the login process as 'okay' but clearly routes to accelerate this process potentially with a single sign-on solution may help reduce the time and effort required.

Conclusions

The trial has established the compelling economic value of mobile working even within the context of early stage deployment in which some clinical services use RiO primarily for contact and caseload management. With the average value of the time saved or released per user being £298 per month and the average cost of the solution being just £30 per month even with incorporation of other services/costs into the solution, the net-benefit is likely to remain robust. Greater time saving can also be anticipated with wider deployment and associated change support thus further enhancing the potential benefits.

The trial has also established the broad based beneficial impact of mobile working not just in terms of productivity, but also through wider operational, clinical/patient and user perspectives. Although clearly identified by users within the timescale and scope of this trial the financial benefit of these aspects has not been evaluated. Aspects including staff satisfaction, patient safety, patient access and overall cost optimisation are likely to accrue considerable additional financial benefit. Whilst the economic value calculated in the trial is based purely on the value of the time released, it is feasible there could also be significant direct cost savings with full scale deployment through these areas.

Beyond the direct economic value, the trial has also established that mobile working can act as a catalyst to support wider and deeper use of RiO within the trust. Combining mobile working in RiO deployment programmes can therefore help create a self enforcing loop in which mobile working enables users to maximise the benefits of RiO, and by having wider RiO usage the benefits of mobile working are also enhanced.

Removing the current requirement to access, use and update information from fixed office locations mobile working enables clinicians to work from any location with far greater flexibility. This represents a significant change in which the capabilities can be embraced and used to refine working practices for greater efficiency, speed and effectiveness. For maximum advantage, this may require refinement of organisational, managerial and even cultural aspects, which have naturally developed based on the requirements of paper-based systems. Such change may require policies to be reviewed, for example to allow home working, but much more importantly it also incorporates effective change management to ensure the practice, as well as policy, is evolved.

Finally and most crucially, the trial has demonstrated that the mobile solution developed for the trial works reliably and cost effectively today. Technology will of course continue to evolve but the trial has shown that implementing mobile working today can release compelling economic value, support deeper RiO usage and wider organisational change for the overall benefit for PCTs.

Support for your Trust?

To help PCTs to evaluate the full potential of mobile working, develop the approaches needed for successful implementation and to define the associated business case, Dell are able to offer a comprehensive consultancy support service drawing on the findings of the this and other research.

Further information

To learn more please contact your Account Manager, visit www.dell.co.uk/healthcare or call 0870 191 3315.

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