Abstract

In this report, we examine the impact of pager systems in the modern day NHS. At present, there are approximately 130,000 pager units in use by the NHS. In fact, there are nearly as many pagers in circulation as there are hospital beds.

With a particularly high concentration of devices in Acute Care, there is a significant cost being paid in loss of efficiency and increased administrative support for the out-of-date communication channel.
Key Facts

**Number** of pagers in the NHS

129,429

**Cost** of pagers in the NHS p.a.

£6,600,879

**Savings** p.a. from mobile software

£2,718,009
About CommonTime

CommonTime build intelligent messaging solutions that create better communications for organisations around the world.

Clients use our secure systems every day to make informed decisions at crucial moments.

Drawing on mobile expertise and clinical understanding, we work with NHS Trusts to improve communication & patient care.

Foreword

In this report, we examine the use of traditional paging systems for critical communications in the modern NHS.

In particular, our research focuses on how these ageing devices form an integral part of day-to-day crisis response, as well as how this impacts patient outcomes.

In a sector that is in constant change and turmoil, digital modernisation strategies are being gradually implemented. Clinicians and patients alike are beginning to see benefits from the introduction of new technologies.

However, pagers, remain an icon of the institution. Given the current global climate, it is questionable whether pagers are equipped to deal with the strain on the modern day healthcare system.

Healthcare communication systems have never been so vital. Yet, pager units prevail throughout the NHS as the dominant method of emergency communication.

The withdrawal of Vodafone from the UK pager market further serves as a warning regarding the future of the technology.

The announcement is also an opportunity for digital leaders to examine communication strategies and crisis response processes within the NHS.

This report has been produced to take stock of the current use of pagers within the NHS, with a view to highlighting important considerations for digital transformation.
Overview

Nearly half of emergency response time is wasted due to inefficient communication.

An Ageing Technology

Pagers reached the peak of their popularity in 1994. At that time, there were approximately 61 million in use across the globe.

Today, that number is far fewer. With dwindling support and benefits that have been outstripped by mobile devices, there are now believed to be less than 1 million worldwide.

Despite this, our research estimates that there are still approximately 130,000 (129,429 \( a \) to be exact) in use within the NHS.

“Pagers seem like old technology, but they still exist for their inherent high levels of resilience.” - Geoff Hall, CCIO Informatics Leeds Cancer Centre

This high figure is often attributed to reliability of the devices, which operate on radio frequencies as opposed to mobile or internet networks.

However, reliability comes at a price. Research from the US Ponemon Institute estimates the economic impact of pager inefficiency at $11 billion.

In the UK, the direct cost of pagers to the NHS is estimated to be £6,600,879.

However, it is worth noting that this does not include network maintenance or the cost of inefficiency, which can add a significant extra cost.

Based on the current market price, our research indicates that the NHS could save up to £2,718,009 per year - or over £10 million across 4 years - by replacing pagers with smartphone based applications.

Pager Usage Deep Dive

Considering the significant financial impact of the communication channel - it is important to understand exactly how it is used in a modern day healthcare environment.

There are two core uses for pagers in NHS Trusts; non-emergency communications and response team assembly.

Despite the wide range of paging processes, the majority of pagers can be found in Acute Trusts. Only 7.2% of all pagers in the NHS are found in Mental, Ambulance and Community Trusts.

Further, out of our sample, only 3 Trusts did not use pagers, indicating that the devices still have a surprisingly high market penetration rate of 97% in healthcare.
Figure 1
Percentage of NHS Trusts that use/do not use pagers.

Figure 2
Average number of pagers across individual NHS Trusts.

Figure 3
Breakdown of pagers across Mental Health, Ambulance and Acute Trusts.
Paging in the NHS

Acute Trusts

"Over £6million is spent per year on pagers in Acute Care alone."

**Pagers in Acute Care**

Acute Care settings account for 93.29% of all pagers in use throughout the NHS.

Additionally, Acute Care has the widest range of pager penetration. In this group, Trusts had anywhere between 4,700 and 2 pagers - with an overall average of 685 per organisation.

By comparing the pager/bed and pager/staff ratio, it is possible to uncover a number of other insights about this group.

Acute Trusts were found to have an average of 0.94 pagers per bed - almost a 1:1 ratio.

However, the same Trusts had an average of 0.14 pagers per staff member. Therefore, a pager must be shared between 7 staff members for full coverage.

However, this varied drastically depending on Acute Trust financial resource and digital strategy realisation.

**The Link to Digital Maturity**

Perhaps the most interesting result from this research has been the mirrored relationship between pager density, digital maturity and Trust income.

"Pagers represent 20th century technology and are a blunt instrument for communication." - Rowan Pritchard Jones, CCIO St Helens & Knowsley NHS Trust

The 10 largest NHS Trusts in the UK by income were found to have an average of 1 pager for every 8.7 staff and an average Clinical Digital Maturity Index (CDMI) rank of 39.7.

Meanwhile, the 10 smallest NHS Trusts have an average of 1 pager for every 3.6 staff and a CDMI rank of 78.8.

This shows a clear correlation between income and reliance on pagers. One potential explanation is that the greater financial resource a Trust has access to, the more likely it is that pager based processes have been replaced with more modern systems.

These results were not only present in the top & bottom 10 Trusts, but also in the upper and lower quartiles as a whole.

This difference is mimicked by the relationship between pager usage and CDMI rank.

£6.12m

Over £6million is spent per year on pagers in Acute Care alone.
There is an average of one pager for every 8.7 NHS staff in the top 10 largest Acute Trusts as ranked by income. However, there is one pager for every 3.5 staff in the smallest (as measured by income). This indicates a much lower reliance on pagers as a communication method in Trusts with higher spending power.

**Figure 4**
Percentage of Acute Trusts that use/ do not use pagers.

**Figure 5**
Average number of pagers across individual Acute Trusts.

**Figure 6**

0.94 pagers/bed

0.14 pagers/person

**Figure 7**
Number of pagers per bed and staff
Paging in the NHS
Mental Health Trusts

Our data suggests that Mental Health Trusts typically have a lower amount of pagers across the organisation - most likely attributable to the nature of work undertaken by Mental Health Trusts. We found that there are, on average, approximately 136 pagers actively used by staff in each organisation. The highest reported number of users for a single Trust was reported as 1600 units on-site. Whilst still a significant number, this is the lowest average from our sample groups - Acute, Ambulance and Mental Health Trusts. Not only this, but a lower amount of units per head can also be noticed.

Bed & Staff Comparisons
There are only 0.04 pagers per each member of staff, drastically lower than the same data point in an Acute care setting. Similarly, the ratio of pager units to hospital beds is significantly less at 0.29 - much lower than the Acute average of 0.94.

“Because pagers are so much part of the wallpaper, nobody is thinking about how we could best meet our workflow needs.” - Johan Waktare, Health Informatics Consultant

This lower number of units is most likely a result of the absence of A&E departments in Mental Health Trusts.

While paging is often the primary method of communication in Acute Care during emergencies - there are far less emergencies in Mental Health settings. However, the remaining presence of pager units does indicate an ongoing reliance on this technology for less critical internal communication.

Finally, we can observe that 5% of Mental Health Trusts have migrated to non-pager based communication altogether.

The speed at which Mental Health Trusts replace pager services has been forecast to be much higher than other healthcare settings, due to the urgent communications which are relied upon.

Figure 8
Percentage of Mental Health Trusts that use/ do not use pagers.

Figure 9
Average number of pagers across individual Mental Health Trusts.

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Community Responders

Ambulance Trusts made up the smallest group in our sample - with responses from six out of the eleven in the UK.

Out of these, five reported pager usage, whilst only one did not. The average number of pagers per Trust has been calculated to be 458 - with a high of 1,200 and a low of 13.

But in this case, it is not the number of pagers within Trusts that provides interesting analysis - but rather the contexts in which they are used.

“There has to be a more refined, accountable and reliable way to communicate; doubtless a task the smartphone could cope with.” - Rowan Pritchard Jones, CCIO Whiston Hospital

Pagers seem rarely used to assemble trauma teams, or for day-to-day communications. Instead, in this environment, pagers most commonly act as an alerting system for community responders and staff, leading to a much higher pager/ staff ratio than organisations of 1:0.31.

Further, many Ambulance Trusts rely on wide area networks, which are ripe for replacement. A mobile approach to comms would also overcome the issue of requiring community volunteers to carry Trust issued devices.

“80% of all Ambulance Trusts still use pagers.”

**Figure 10**

Average number of pagers across individual Ambulance Trusts.

**Figure 11**

Percentage of Ambulance Trusts that use/ do not use pagers.
State of the Market
Despite the presence of alternative, more efficient communication methods, it is clear that pagers are still prevalent in 2017, especially within the NHS.

In fact, estimates would suggest that NHS Trusts account for over 10% of all pagers in circulation worldwide.

Considering the drawbacks of pager based processes - including the lack of two way communication and auditing capabilities - it is surprising that legacy equipment that is relied upon in emergency situations so heavily.

It can even be theorised that the reliance on inefficient and limited methods of communication is behind the reported usage of shadow IT systems within the NHS. As highlighted by the BBC, the lack of modern communication systems is driving staff to discuss patients on channels such as WhatsApp and Snapchat.

“The lack of robust communication systems in the NHS is driving staff towards alternative, non-approved technologies.”
- Steve Carvell, CommonTime Head of Public Sector

Addressing the Issue
Acute Trusts with higher CDMI ranks are beginning to migrate towards more efficient solutions.

The top quartile of digitally mature Acute Trusts now use less than half the amount of pagers than others and are actively increasing the reliability and efficiency of their communications.

Ultimately, patients are not invested in the technology or process Trusts use to communicate.

However, the effects of communication channel choices on healthcare speed, security & cost are far more important to the public.

In the era of austerity and growing financial pressure, NHS Trusts must make decisions which result in long term improvements in efficiency & cost savings balanced with short term needs.

Modernising communication technology to generate positive patient outcomes is an investment that must be made. Pagers cannot continue to exist in the NHS anymore.

Paging in the NHS
Conclusions

“Ageing communication channels are leading staff to use shadow IT systems.”
Full Quotations

"Pagers seem like old technology, but they still exist purely for their inherent high levels of resilience. They are simple to use i.e. calls can be pushed out by ringing one number, there is an audit trail, the device is easy to carry, and the battery lasts months, not hours. They do only one task, but they do it well. They provide a last line of defence.

Internally we operate on our own radio infrastructure. The paging networks have few points of failure unlike Wi-Fi infrastructures, operate on dedicated frequencies, and can easily be ring fenced to ensure continued service during power outages.

In terms of radio technology, they operate at a much lower frequency to those used by mobile phones. The low frequency has the benefit of travelling further, therefore better coverage and has much better building penetration. The frequency is also considerably less congested, so in times of peak demand, e.g. New Year's Eve, or during a major incident, the message will still get through." - Geoff Hall, CCIO & Associate Medical Director - Infomatics Leeds Cancer Centre and Dave Moody, Data & Telecoms Infrastructure Manager Leeds Teaching Hospitals NHS Trust

"Pagers are a technology that have very much stood still. I think that Trusts need to have a strategy for how they're going to move forward in this area. The statistics about the number of pagers and so on per Trust, I'm not sure what one can really read into it.

The key thing is about pager technology is that there is always a strong case for having a resilient way of being able to contact people, classically for crash alerts. But, for many of the other tasks that pager technology is used for, they're not very efficient and clinical time is wasted.

I remember when I was a junior doctor, when you get bleeped you couldn't call back for 5 minutes then, when you do get round to calling back, the user is on an extension that's engaged or nobody knows who it was that paged you etc. I think that there is a definite gap for people within the Acute sector for a high resilience means of contacting people. I think from what I've seen and from what I've heard most people haven't thought about what that should look like in the 21st century.

Pagers are not being used particularly effectively at the moment. Nobody has really looked into this because pagers are so much part of the wallpaper in the NHS, nobody is really thinking about how we could best meet our workflow needs in 2017.

There is the argument that it isn't broke, why fix it? And I think that will be a challenge in a lot of organisations. For me the key point will be a case of people reviewing their communications strategy to their clinical staff and implementing new, updated tech – how many organisations will find the time to actually do that? I won't be surprised if there aren't that many but if they need that solution to be created you will find some appetite for it. It's simply because we have this low tech, aging technology which is fairly reliant meaning it doesn't make it up the list of priorities for a lot of organisation. However, if they took the time to look at it then there are lots of savings in clinical staff time, and better end user satisfaction.

Whether they will do that, I suspect many of them wont. Hopefully organisations will take a lead on modernising their communication strategy through clinical staff but we'll have to wait and see." - Johan Waktare, Director & Health Infomatics Consultant ITEH

"Pagers represent 20th Century technology and are a blunt instrument for communication. Apart from a ‘fast bleep’ doctors have no sense of the urgency or priority of a call, end up writing down messages that can be lost, and often find a telephone number engaged when they do answer it. Spare a thought for the ‘bleeper’ sitting by a phone waiting for an answer from a doctor who may be at a bedside performing a task for ten minutes.

There has to be a more refined, accountable reliable way to communicate. Doubtless a task the smartphone could cope with provided we are assured of the wifi or signal coverage in modern day hospitals." - Rowan Pritchard Jones, CCIO St Helens and Knowsley Teaching Hospitals NHS Trust

Notes on Data

"Results based on a sample of 141/219 (64.3%) Acute, Mental Health and Ambulance NHS Trusts in the UK; with a 5% margin of error and confidence interval of 95%. Individual figures were collected via Freedom of Information Requests to Trusts. Pricing model provided by a market leader in pager hardware.

Footnotes

About CommonTime

We build intelligent messaging systems that create better communications for organisations around the world. Clients use our secure communication tools every day to make informed decisions in response to critical events.

We are passionate about empowering organisations with intelligent communications that help consistently deliver the best possible service to their customers.

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