

Institution: Loughborough University
Unit of Assessment: D36a Communication, Cultural and Media Studies, Library and Information Management
Title of case study: Improving Police Efficiency and Effectiveness through Mobile Technologies
<p>1. Summary of the impact (indicative maximum 100 words)</p> <p>The impact of the research at Loughborough University from 1999 to date has transformed informational processes in Leicestershire Police and has been adopted by other Police forces across the UK and internationally. Within Leicestershire it has led directly to [5.1]:</p> <ul style="list-style-type: none"> • improved visibility and accessibility of police on the streets (risen by 44%), • less duplication in crime recording, • a reduction in vehicle travel and officer return journeys to police stations, • improved real-time access to criminal intelligence, • financial savings of in excess of £5m, • and better operational use of officer resources.
<p>2. Underpinning research (indicative maximum 500 words)</p> <p>Underpinning research undertaken from 1999 to date at Loughborough University has provided new methods (e.g. 2.1), approaches (e.g. 2.2), and impact evaluation studies (e.g. 2.3 to 2.5), to provide an information management toolkit to enable operational improvements. This research was undertaken by Professor Tom Jackson (Loughborough University, 2002 to date), Dr. Louise Cooke (Senior Lecturer, Loughborough University, 2006 to date) and Dr. Rachael Lindsay (Loughborough University PhD student 2007-2010; RA 2010–2011), at Loughborough University from 2008-2011.</p> <p>2.1. Stakeholder analysis and feature matrix methods were developed to aid in the selection and decision making phases of Information System purchases. These methods were used for the selection and implementation of Mobile Data Terminals (MDT) in Leicestershire Police.</p> <ul style="list-style-type: none"> • <i>Research by Dawson (Professor, Loughborough University, 1987 to date), de Chazal (Loughborough University, PhD student, 1999-2003). Commissioned by Rolls-Royce and Loughborough University [G3.1], [3.1];</i> <p>2.2. The development of a business-process approach to introducing knowledge management systems and processes while ensuring minimal resistance to change. The 'Goal Oriented Knowledge Management' method developed in this research was used to determine both the impact of the MDTs on current policing processes and the amount of managed change required.</p> <ul style="list-style-type: none"> • <i>Research by Jackson, Dawson and Balafas (Loughborough University, PhD student, 2002-2009). Commissioned by The Danwood Group [G3.2], work also conducted with RBoS and HSBC, 2002-2009, [3.2].</i> <p>2.3. The evaluation of information management processes and systems in the policing sector and the limitations and impact Freedom of Information legislation and media behaviour exert on information management practice in UK police forces. This theoretical approach was used to undertake an impact evaluation of the proposed MDTs.</p> <ul style="list-style-type: none"> • <i>Research by Louise Cooke. Worked with Derbyshire Police and Leicestershire Police, funded by Loughborough University, [3.3];</i> <p>2.4. The evaluation of Police officers' use of email communication and workflow, resulting in the development of an engaging training programme being rolled-out throughout the Force improving communication efficiency. The training method was adapted for the MDT roll-out.</p> <ul style="list-style-type: none"> • <i>Research by Jackson, Janet Edwards (Lecturer, Loughborough University, 1987-2007) and Burgess (Loughborough University, PhD student, 2002-2006). Approached by</i>

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Leicestershire Police to conduct the research and funded by Loughborough University, 2005, [3.4];

2.5. Determining the information seeking and sharing behaviour of Leicestershire Police to provide an understanding of how officers work in the field. The results enabled the conceptualisation of the mobile-Technology Acceptance Model - m-TAM model developed in the impact case study.

- *Research by Tedmori (Loughborough University EngD student, 2003-2008), Jackson, Dino Bouchlaghem (Professor, Loughborough University, 1994 - 2012). Approached by Leicestershire Police to conduct the research and funded by Loughborough University, 2006, [3.5].*

This combined underpinning body of research into introducing new systems and tools into organisations with maximised potential and minimised resistance led to a significant and original contribution to the extant work on technology acceptance in complex organisations of all kinds. This in turn has played an important role in enabling the success of the research into MDTs.

3. References to the research (indicative maximum of six references)

Underpinning research that has been published in leading international peer-reviewed academic journals and conference proceedings:

- 3.1.** de Chazal, M, Pearce, H, Dawson, RJ (2002), Business Needs Driving IT Decisions - Using Feature Analysis and Stakeholder Evaluation in Rolls-Royce, In *EASE(Evaluation and Assessment in Software Engineering) 2002*, Proceedings of the Conference on Empirical Assessment in Software Engineering, Keele, UK, 205-213, DOI: 10.1.1.106.2511. <https://dspace.lboro.ac.uk/2134/13548>
- Peer reviewed and leading conference in empirical assessment
- 3.2.** Balafas, P.J., Jackson, T.W. and Dawson, R.J., (2005), Deploying Knowledge Management and Securing Future Sponsorship within A Highly Hierarchical 'Role-Based' Organisational Culture, *International Journal of Knowledge, Culture and Change Management*, 4, 643-652, ISSN:1447-9524. <https://dspace.lboro.ac.uk/2134/2278>
- 3.3.** Cooke, L. and Sturges, P., (2009), Police and media relations in an era of Freedom of Information, *Policing and Society*, 19(4), 406-424, DOI: 10.1080/10439460903281513
- 3.4.** Jackson, T. W., Burgess, A., & Edwards, J. (2006), A simple approach to improving email communication - Going back to basics, *Communications of the ACM*, 49(6), 107-109. DOI:10.1145/1132469.1132493
- 3.5.** Tedmori, S., Jackson, T.W., Bouchlaghem, N.M. Newcombe, M. (2007), Information seeking and sharing behaviour of a UK police force, *Proceedings of the Eighth European Conference on Knowledge Management*, European Conference on Knowledge Management (ECKM 2007), Barcelona, Spain, 982 - 988., ISBN 978-1-62276-524-9. <https://dspace.lboro.ac.uk/2134/13402>
- Peer reviewed and the top European conference in Knowledge Management

Select research grant support:

- G3.1.** Prof. Dawson;
Title: "Using costing methods to support project option decisions "
Period: 1999-2003
Sponsor: Rolls-Royce
Total awarded: £45,000
- G3.2.** Prof. Jackson
Title: Goal-Oriented Knowledge Management
Period: 2002-2005
Sponsor: The Danwood Group
Total awarded: £69,000

4. Details of the impact (indicative maximum 750 words)

Understanding gained from the body of underpinning research detailed in 2, led to the adoption of a unique approach to technology evaluation and implementation, by Jackson, Cooke, and Lindsay when they were approached in 2007 by Leicestershire Police to research the selection, implementation and embedding of a mobile policing system. Using analytical tools such as feature analysis matrices [2.1], evaluation frameworks [2.1] and technology adoption models, research has led to impact on the efficiency and effectiveness of policing in the Leicestershire Police. The unique aspect of Leicestershire Police’s mobile solution, informed by the research, was the adoption of Mobile Data Terminals (MDTs) into response vehicles, with a Citrix Operating System, offering a user friendly interface and keyboard, with full desktop access to all officer information systems, thus ‘mimicking’ desktop access available in the police station and reducing need for response officers to return to base. This contrasts with the less successful, but more common, approach of many Forces relying on the provision of Blackberry hand devices to officers. The in-car MDT solution contributed directly to the achievement of a number of significant public policy goals for policing, such as higher street visibility, higher profile neighbourhood policing, and reduced time spent on bureaucracy. Statistics from April 2012 [5.1] demonstrate that, since the implementation of mobile technology within the Force:

- Visibility of response officers has risen 44%;
- Patrol hours for response and neighbourhood officers has increased by an average of 8000 hours/month;
- All crime within the Force’s region has fallen 26.6%, with burglary down 23%;
- Public confidence in the Force has almost doubled to a current level around 85.4%;
- Public satisfaction with the Force’s response to Anti-Social Behaviour stands at around 92.5%;
- Anti-Social Behaviour rates are the third lowest in England and Wales at 39.85 per 1000 population and are still falling.

Senior Force personnel have declared strong confidence in the significant role that the Loughborough University research played in this success [5.2]. In terms of cash savings, the evidence shown by Table 1 indicates that mobile technologies have contributed to financial productivity improvements within Leicestershire Police of over £5 million for 2009 and 2010.

Table 1: Summary of financial savings to Leicestershire Police following implementation of MDTs [5.1]

Benefits	Financial Saving
Local Police Officer Visibility	£3,582,092
Mileage savings (April 2010 to Oct 2010)	£10,516
Reduction in crime input staff (per annum)	£37,219
Sale of police buildings: revenue costs	£245,535
Sale of police buildings: capital costs	£1,200,000
TOTAL	£5,075,362

The MDTs are also facilitating further modernisation of policing with new ways of working including:

- Remote working in isolated, rural sites, with 80 police officers now operating in the heart of local neighbourhoods;
- More efficient witness viewing/ ID procedures;

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- Custody visits using handheld devices;
- Automatic Number Plate Recognition (ANPR);
- Major crime investigation features e.g. HOLMES enquiries which now update immediately leading to real-time intelligence-led policing;
- More efficient crime reporting process, with time taken reduced from three days to 11 minutes;
- Electronic signatures for witness statements;
- Mobile control rooms for major events such as Download festival and EDL protests;

The project was recognised at the 2009 UK British Computer Society IT Industry awards [5.3]. It has also received significant media attention (as detailed in 5.4 to 5.7).

As an indication of the reach of the impact from the project, the system is being introduced into other UK police forces. To date 15 forces have visited Leicestershire to see the MDTs in action and the following forces are now using the system: Hampshire, Dyfed Powys, Cumbria, Norfolk and Suffolk. Forces in Essex, Hertfordshire and Avon and Somerset are currently in negotiation with the suppliers with a view to purchasing the terminals. Warwickshire and Nottinghamshire have adopted the Citrix operating system desktop solution using alternative hardware. Internationally the system is now being used in Saudi Arabia and Azerbaijan, indicating the global reach of the research impact [5.1].

National recognition of the effectiveness and impact of the Loughborough University work resulted in the Budget and Performance Review Committee of the London Assembly inviting Jackson to provide expert advice on potential mobile data solutions for the London Metropolitan Police Service in March 2013 [5.8].

5. Sources to corroborate the impact (indicative maximum of 10 references)

The following sources of corroboration can be made available at request.

- 5.1. Email from Inspector, July 2012
- 5.2. Chief Constable Leicestershire Police (supporting letter provided)
- 5.3. Mobile Data Terminals: Recognition for the work undertaken with Leicestershire Police on mobile data terminals at the 2009 UK British Computer Society IT Industry <http://www.bcs.org/content/ConWebDoc/28250> (under Public Sector Project of the Year on page)

Media Coverage & Awards

- 5.4. Mobile Data Terminals: TV Programme - 2011 - BBC Inside/Out <http://www.bbc.co.uk/programmes/b017xcfv>
- 5.5. Mobile Data Terminals: News ref: http://news.bbc.co.uk/nol/ukfs_news/hi/newsid_7800000/newsid_7804800/7804847.stm
- 5.6. Mobile Data Terminals: BBC News - http://www.bbc.co.uk/leicester/content/articles/2008/08/07/more_bobbies_on_the_beat_feature.shtml
- 5.7. BBC News: 5 December 2011. Leicestershire Police save £4.2 million using mobile devices. <http://www.bbc.co.uk/news/uk-england-leicestershire-16029267>

Other Corroborating Evidence

- 5.8. London Assembly: *Met Police Technology* <http://www.london.gov.uk/mayor-assembly/london-assembly/investigations/met-police-technology>