

## **New research from Leeds University proves that interactive technology can lead to more informed and effective policing**

But integration and purchasing failings are slowing progress and could even make the technology useless

*By Malcolm Stewart, Public Sector Business Manager, steljes – short bio intro (one-two sentences).*

New academic research findings have revealed that the use of SMART Board™ interactive whiteboards in policing are providing clear benefits for routine briefings and operational planning, but that common failings in integration and purchasing are inhibiting wider-scale adoption of the technology within Police Forces in the UK.

The research, commissioned by Steljes, the company responsible for the mass adoption of the SMART Board interactive whiteboard in the UK, and conducted by AIMTech, Leeds University Business School's research group, examined the effectiveness of interactive technology in emergency planning, command and control and briefing scenarios in line with the National Intelligence Model<sup>1</sup>.

### **Faster decisions leading to better retained intelligence**

Malcolm Stewart, Public Sector Business Manager at Steljes Ltd was delighted with the research results. He says, "The research has provided us with a clearer picture of how interactive whiteboards can benefit modern-day policing. The key issues unearthed by the report show the importance for a common purchasing and adoption process, and the need for the technology to be integrated at the heart of the policing processes."

The report highlights how technology such as interactive whiteboards can help make presentations dynamic, impactful and highly visual. Evidence unearthed during the research demonstrates that these presentations are more easily and quickly absorbed and they encourage interaction, leading to much better use of information. This in turn lead to faster decisions in the command setting, and more complete and better retained intelligence in the more routine briefing settings.

The research also uncovers areas of concern and outlines recommendations for how Constabularies can gain the most benefits out of the technology. One of the key findings was that the technology needs to be integrated into the large information systems as part of the overall information management process. The technology has to be acquired with the view that it will be an integral part of how business is conducted and

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<sup>1</sup> The National Intelligence Model (NIM) is 'A Model for Policing' that ensures information is fully researched, developed and analysed to provide intelligence, which enables senior managers to provide strategic direction, make tactical resourcing decisions about operational policing and manage risk.

appropriate resources made available for support and training carried out if the organisation using it is to gain most benefit.

The report also highlights some other areas of interest:

- Policing departments require a lot of support to reach the full potential of the technology.
- Technology should be integrated into the overall business intelligence architecture.
- There are a lot of "one off" purchases, which means that technology is not being used to its full potential. In these circumstances it is often seen as a display technology rather than an essential part of the information architecture.

## Research background

As the leading educational technology distributor in the UK, Steljes Ltd has been providing SMART Board interactive whiteboards, as well as other technology solutions to the Police and other emergency planning organisations for several years. While it has seen how there has been an increased uptake of the technology, the company was interested in examining the context of its use and commissioned research group AIMTech to carry out a qualitative and quantitative research project. The research culminated in the report released in June, *'SMART Board interactive whiteboard Use in Policing: Intelligence briefing and Strategic Command & Control Communications'*.

Malcolm explains, "There was no academic research on this area and we wanted to understand how various Police departments use SMART Boards, and how they can use the technology to lead to a greater adoption of the National Intelligence Model."

The objectives of the research were:

- To find out how interactive technology can improve emergency planning, command and control and briefing scenarios.
- To establish how the technology is being used and what benefits are being delivered.
- To establish how the use of interactive whiteboards can increase understanding of intelligence, and whether the technology can lead to greater adoption of the National Intelligence Model.

Data was collected through visits and interviews with several Constabularies, the Police Information Technology Organisation (now NPIA), and a Professional Reference Group with representatives from the National Police Improvement Agency, Her Majesty's Inspectorate of Constabulary and the Association of Chief Police Officers.

AIMTech base its research on activity theory. This approach ensures that the technology is researched within its context, with a desired outcome and motive for use. It enables the researchers to view the technology as a tool that can either enable or constrain the way people work. In this report, the researchers focused on briefing officers, and Gold/Silver Command.

Other areas that are impacted by the research include the preparation of intelligence information for the use by officers, intelligence in front line situations, and intelligence in strategic situations. In reality, these form part of a larger system, either for the management of major incidents, or for front line policing.

## Research findings

The report uncovered evidence to prove that there can be a significant gain in effectiveness of communication where SMART Board interactive whiteboards are used. However, this gain is not automatic, it can be difficult to measure the return on investment, and there is a high level of organisational understanding and change needed in order for the technology to be used effectively.

### *1. Supply chain*

Technology doesn't exist in a vacuum and to be effective, interactive whiteboards have to exist within an information infrastructure. For example, within a command and control setting the technology needs to be able to access and display a wide range of information sources. This requires advanced planning by someone who knows how to use the technology so that the correct information is easily accessed and used.

Command operators might, for example, want to use interactive whiteboards to control a large gathering of people. They can then use the technology for the display of schematic maps and aerial footage alongside appropriate library images to plan actions, as long as these are either uploaded to the right place, or can be accessed through a reliable network.

“We have run a number of exercises using technology including the SMART Boards, and the results have been very impressive,” says Inspector Michael Baird from the Police Service Northern Ireland, who uses interactive whiteboards within their Silver Command suite at Belfast International Airport. “All the call signs for our units and detailed maps of the area are now entered into the system, so that as an exercise progresses the Silver Commander has an accurate and up-to-date picture of what is going on.”

### *2. Process of adoption*

One of the issues identified is that of how technology is purchased and distributed throughout the organisation. Interactive whiteboards, in particular, are either bought as an individual purchase by an individual with a specific need, or as part of a larger initiative to improve the effectiveness of the whole organisation.

Problems often arise where technology is acquired by an individual. While very well used while the champion still works for the organisation, the interest in the technology often wanes if that person leaves or moves to another role. The replacement might not be trained in how to use the technology.

Another challenge is to get newly acquired technology to fit into the organisation's overall systems and processes, so that support can be provided centrally. Interactive whiteboards are often victims to this challenge. Because they are regarded as a display technology they are not integrated into the operational processes, and presenters can therefore not use them to their fullest potential.

The report suggests that the ideal process of acquiring interactive technology is centrally driven, designed to change processes and ways of working rather than to just buy a new piece of kit to improve the look of presentations. It recommends that potential purchasers involve a range of people in the decision and implementation, including technologists, operational users and those who will be responsible for training and support, to get the best start possible.

### *3. Stated reasons for adoption*

Most people interviewed agreed that the reason for why they bought an interactive whiteboard was to improve the presentation of information. But they also agreed that after starting to use the technology they realised that this was only a small part of what it is capable of.

Benefits such as the ability to introduce interactivity into the work they do with others, and the ability to rapidly and effectively integrate diverse sources of information, quickly became far more important to them.

### *4. Broad context of use*

While this report focuses on the use of interactive whiteboards in the route intelligence briefing process and the command and control process, researchers found that the technology is used in a much wider context.

It seems that where the technology is introduced in order to fulfil a specific task and this is done well, then other people often suggest other potential uses which can be quite different from its original context of use.

These settings include, for example, planned and formal training, ad hoc and informal training, operational planning, preparing templates for briefings and incident management, incident debriefings, training simulation, and routine management meetings and briefings.

Some of the people interviewed commented on their use:

"I tend to use it for doing 'what ifs', so when we're looking at resources we can see what the impact of a decision at A is on B and it's a good way of making the numbers come to life."

- Police Staff Manager

“This isn’t an area where we can afford mistakes and so clarity is everything. Being able to put the plans up on here, develop them and make instant changes means we’re all on the same page - no pun intended.”

- Operational officer dealing with previous Firearms role

“Officers feel a bit more accountable when they see their name up there in lights - it means it’s that bit more likely that they come back to me with the task done that bit faster.”

- Task Officer

### Areas of benefit

The benefits that those interviewed talked about centred on the use of the SMART Board interactive whiteboard as a way of presenting information. However, when researchers probed further they discovered that users also gain benefits from the way they work with information. Most of the value an organisation can expect therefore comes from the overall change in the way information is processed rather than just an improved way of delivering presentations.

“Forces currently using the technology have found that the capability to capture evolving information means the record of an incident can be assessed in detail and used as the basis for effective debrief and learning,” says Malcolm. “It can provide the foundation for development of further exercises and training based on live incidents. It is a key facility not only in allowing a force to ask ‘what went wrong?’ but also to learn from what went right; something which the emergency services in the UK have commented that they do not always do as effectively as they would like.”

He continues, “The ability to network sessions is seen as a huge potential benefit in emergency planning; for instance, the ability to conduct a joint briefing for a cross-force operation which can be added or amended to by users in two or more separate locations; the ability to take a downlink from a helicopter at location A and send it to location B where the incident is actually being managed; or the ability to share screens across geographically separate Gold, Silver and Bronze commands, and potentially with other agencies or specialists.”

Being able to effectively display information adds value to the policing process because:

- Users can draw information from diverse and multiple sources of information such as maps, blueprints, sketches and overlays.
- It improves the speed of communication; a picture is worth a thousand words, reducing the time needed for lengthy explanations.
- Users can build up scenarios with a range of inputs - ‘if I put a car here, and he drives that way, then you need to put a car here...’
- A common understanding is built as a foundation for further briefings which, in effect, equips participants better for their job.

The report also found that interactive whiteboards can improve the speed with which decisions are made. This is valuable because:

- Decisions can be updated faster,
- It provides a channel for a Commander to do this wherever they are - even remotely from the command area,

- It eliminates, or drastically reduces, the need for operations and resources having to chase the responsible officers for information, and
- It acts as a channel up to Gold command or down to Silver.

Malcolm explains, “It was found that they provide a faster build up of a common operational picture, reduced instances of misunderstanding between those involved in the management of an incident and resulted in faster decisions, leading to more effective containment of that incident. It provides a channel for a Commander to do this wherever they are - even if remote from the command area.”

Operational benefits that technology users can expect therefore include:

- The ability to build a common operational picture faster.
- A reduction in the incidents of misunderstandings between those involved in the management of an incident.
- Faster decisions that lead to more effective containment of an incident.
- More complete information will be available, reducing the unpredictability of reactions to an event.
- It will take less time to communicate a decision up and down the chain of command.
- Those involved in the briefing or incident will have more opportunities to add their input, which in turn can become more varied.

#### *Improved communication effectiveness*

The report found that significant improvements in the effectiveness of communication are being made where interactive whiteboards are used.

In the case of routine briefings, interactive whiteboards can increase participation, attention and the ability to capture points - as a result, briefings are more comprehensive and accurate, and information better retained.

Within command and control, it was found that interactive whiteboards provide a faster build-up of a common operational picture, and reduce instances of misunderstanding between those involved in the management of an incident; resulting in faster decisions, leading to more effective containment of that incident. It provides a channel for a commander to do this wherever they are - even if remote from the command area.

Users can plan for interaction during briefings and therefore prepare information better. This leads to a reduction in the time needed to access the same or similar information in the future, it also increases the accuracy and professionalism of the information presented.

#### *Facilitates greater adoption of the National Intelligence Model*

There is a clear link between the use of interactive whiteboards and the Forces being able to provide the recommended corporate approach. NIM emphasises the use of four key assets to improve the effectiveness of operational policing:

1. Knowledge.
2. Systems.
3. Source.
4. People.

Interactive whiteboards are particularly helpful in the areas of systems and people. They can contribute greatly to the effective management of information, keeping information in one place where it's easy to link to and use information from. This means that people can more easily access the information they need at the time they need it.

### Areas of concern

The report also outlines several areas of concern, or challenges, where interviews revealed that the user behaviour is different between those who are successful and those who have less success. Most of the challenges tend to be around the acquisition of the technology, the management of the use of the technology, and the training of those involved.

#### *Acquisition*

The main reason for why users fail to gain the benefits they expected when purchasing an interactive whiteboard is that they don't link the new technology to the existing infrastructure that supports it. Where an individual purchases the board for a specific need, rather than a centrally managed change programme, there is a clear danger that:

- users polarise into enthusiast-users and non-enthusiast non-users,
- the interactive whiteboard may not integrate fully, if at all, with other systems,
- the board becomes inaccessible to people who have not been trained - often the original enthusiast was trained but any others have moved on or forgotten how to use the equipment,
- this isolation means that no community of practice is developed and the interactive whiteboard is seen as being in a silo - a quirk of whatever area that deployed it rather than something that can be used throughout the organisation.

#### *Management and integration*

For the interactive whiteboard to be useful it needs to work within the overall processes and link to other systems and processes.

The Police, in particular, need to be made aware of the following factors for success:

- Hardware: If high quality video, for example, is going to be used, then appropriate hardware needs to be purchased at the same time. A left over PC from an office upgrade will not be adequate.
- Software: The interactive whiteboard should be used with appropriate software, allowing information to be managed to and from the actual equipment, compressing large video files, etc.

- Information sources: An interactive whiteboard can only display information which it is fed. But when available, it can be displayed sophisticatedly and intuitively. For example, in one setting, the PC which is used to operate the board also has a Freeview tuner integrated so that TV feeds can be incorporated into the display quickly. The same setting also makes use of a range of additional map tools such as Google Earth, and the command centre has uploaded many of their emergency plans and standard operational briefings so that they can be easily and quickly used when an incident takes place.
- Technical support: Support has to be in place so that the equipment can be managed and integrated from the start.

### *Training*

Another critical area for the Police to consider when implementing interactive whiteboards is training. Without training the use of the technology is highly likely to fail.

Those implementing a new board should therefore consider:

#### Training content

All users need some level of training in how to use the interactive whiteboard, what possibilities it offers them, and which demands it makes, in order to use it effectively.

For example, a *Commander* needs to be aware of what the technology can and can't do in order to ask for the information to be displayed, managed, and manipulated. They should also be aware of the possibilities for interaction so that they can use this facility effectively when appropriate. The *Board Operator* on the other hand needs to know how to display information, what sources are available, and how to manage the process of acquiring and delivering information effectively. The *Super User* needs to be able to set up and manage the information structure, handle software updates, source additional information resources, and rectify potential problems. The *ICT Department* then needs to be aware of the technical details so that they can provide the correct resources such as bandwidth, storage space and security.

#### Training timing

While most technology users are trained as part of the new implementation, the research shows that unless regular sessions are conducted, the ability to use the system effectively will decay over time. This often leads to a reduction in the effectiveness of the system and the perceived need for training, creating a downward spiral of lack of training that can, in the end, lead to the technology not being used anymore.

#### Training mode

Researchers found that the ICT training that exists is standardised for all users. Some Police departments work with their suppliers to tailor the training to their organisation, but these seem to be the exception rather than the norm. The report suggests that this training would be fully suitable for a new implementation but it also recommends that the Police needs to look at how they provide upgrade training, training for new staff, and training with the right content for the right type of user, personalising the experience in order for the training to be effective and of long term benefit.

## Areas of value

To help readers and potential technology purchasers, the report outlines two scenarios in which interactive whiteboards can provide much added value.

### *Scenario one*

“As the football match afternoon progresses the commander can follow the away fans as they arrive from the coach park. The map showing the designated route can be pulled up on the SmartBoard and the route has already been slightly altered as a result of one of the officers pointing out that what used to be a safe route is now a building site and presents a hazard. This was checked using Google Maps and the helicopter feed stored from earlier in the week. The new route was amended on screen and pushed to the officers affected immediately. CCTV feeds are going to individual units including some officers from the Force area the away team have come from, who have been provided with the images of local nominals likely to cause trouble as well as their own troublemakers who they know. These images and details were exchanged in the joint briefing, with Bridgit [note: software developed by SMART Technologies Inc.] being used to transfer details onto the local system.

When a report of a fight developing comes in the Commander asks for the street plan and also requests the helicopter to provide a live feed, both of these go up on the SMART Board. The plan of the area is amended on screen to show where two cars should be positioned and the foot officers plus a mounted officer are directed in via a safe route with backup.

By watching the live feed and using the landmarks to talk officers in, the fight is nipped in the bud, two arrests made and a van is ready to take the offenders away. Almost immediately after this there is a report of a known drug dealer in the area – but in a new car with only a partial index. No one knows what a Kia Ceed looks like so a library image is pulled up and officers are asked via VR and text to MDTs to look out for it. Five minutes later it is reported parking in a car park and the index is completed. As the car comes up with no insurance the driver / dealer is arrested before he gets out of the car park.”

In this scenario, the benefits come from:

- Being able to ask for and get a range of information effectively displayed and briefed before an operation.
- Being able to amend that information on screen and save it quickly so that it can be communicated to a range of users.
- The ability to have a set of resources ready to integrate and use (helicopter, maps, emergency plans, TV feeds, etc.) reactively as a situation develops.

- Improved ability to see what is happening on the ground, to nip problems in the bud and to manage incidents quickly and safely.
- Frequent saves increases the amount of information which is used to make decisions in order to provide as accurate and complete picture as possible.

### *Scenario two*

“Routine briefing deals with the stars in the area and highlights what is happening. One of those stars is Joe, who has been out of prison for three weeks after a seven-month spell inside. A prolific burglar he has been seen in a couple of old haunts and last night there were three burglaries which follow his style.

The briefing provides an old image and one which is poorer quality but more up to date, it gives some history and some contacts and details of MO. One of the officers comments that she thinks he’s put on weight since that shot and the Sergeant updates this on the sheet. Another person chips in that he’s been seen driving a metallic blue R registered Laguna and this is also added. The Sergeant tasks two officers to go and see if the car is at his address and to get the full index and this goes up on the screen. They will add the result from a terminal in the station later.

A map showing the locations of the burglaries is produced and displayed – one of the officers points out that they are all close to the canal and that Joe’s house is also close, although a mile or two upstream – so what looks quite random actually has a pattern – the map is marked up to show the canal towpath and bridges more clearly. Towards the end of the shift the Sergeant checks the briefing – he now has an index for the car and a note from one of the officers that Joe has definitely put on weight and has also started to grow a beard. Both of these have been added onto the briefing by the tasked officers – one from an MDT in the car and the other from a terminal in the station.

There has also been a Section 60 order made during the day and that needs to go onto the briefing for the morning. A template has been built up and so it just needs the email pasting in and the map area outlining - all the reminders on powers are already there and the key nominals also have their own templates ready to insert”

In this scenario, the benefits come from:

- Better retention of information in the briefing process - well presented information is remembered, it can also be updated quickly and effectively.
- The ability to task officers immediately, and record it, makes them feel more accountable and improves both the rate of tasks being completed and the recording of them.
- Ease of updating means information is shared more effectively and it reduces the problems of briefings becoming static when intelligence officers are off duty. It also prevents a full weekend being spent looking out for someone who was locked up during the Friday night shift, and no one bothered to update the briefing.
- Templates can be produced which are easily reusable, reducing the time and effort in producing an item as well as reducing the time for it to be incorporated.
- Library images mean that queries can be answered easily - so ‘What does a Toyota Aygo look like?’ gets an image rather than a vague statement about it being ‘a smaller version of a Yaris sort of thing’.

- Maps and interactivity increase participation - which can be hard to get on early turn especially.
- Effectively presented information is remembered better and this reduces the incidence of people having to check an index or a nominal (or not doing so because they'd forgotten completely that they were looking for a red Escort, or whatever).

In both scenarios the use of the interactive whiteboard is more about effectiveness rather than efficiency. Briefings will become faster to prepare, more impactful, and hopefully will be updated to reflect new intelligence as well as completed actions. This means that Command will be better informed, more able to react to developing situations and they can then share information more effectively.

### **Effective only within a holistic process**

Effectiveness improvement within a holistic process of business change is the key theme of the report. Interactive whiteboards are capable of delivering benefit across a wide range of areas of policing but can only do so if it is implemented as part of a corporately managed process which effectively integrates the technology and the resources required for its use. Such a managed introduction requires a central initiative in the acquisition, introduction, management and support of the technology as well as a level of corporate attention.

The report concludes with firm recommendations to those who plan to purchase interactive whiteboards:

- If the goal is to improve the effectiveness of the presentation of information across a range of settings, then a potential purchaser should consider the use of the interactive whiteboards as an integral part of their approach to information management.
- Potential users should examine the activities they are trying to affect and also the wider context and frameworks within which information is presented and managed in these activities, including the National Intelligence Model and the National Briefing Model.
- Potential users need to take account of not only the strengths of interactive whiteboards, but also the areas of concern highlighted in the report; in particular the acquisition of the technology, the management of the use of the technology, and the training of those involved.

In effect this means that any acquisition and implementation of interactive whiteboards needs to be carried out in an integrated environment as a part of a holistic corporate approach.

Such an approach should ensure that the systems enabling the use of the technology are engineered in such a way that the key informational, technical and managerial resources are in place to ensure that the technology implementation is a part of a process change rather than being 'bolted on' to existing processes which are not configured to support their use and drive value from the technology.

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### **ABOUT THE RESEARCH**

Responsible for the mass adoption of the SMART Board™ interactive whiteboard in the UK, Steljes commissioned the Leeds University Business School's research group, AIMTech, to conduct the study, working in close partnership with a number of professional organisations such as The National Police Improvement Agency, Her Majesty's Inspectorate of Constabulary and The Association of Chief Police Officers.

Visits were made and interviews were carried out with among others, Lancashire Constabulary, The Police Service of Northern Ireland, Leicestershire Police, The Police Information Technology Organisation (now NPIT) and West Yorkshire Police.

#### ABOUT AIMTECH

Founded in 2002 AIMTech (Adaptation Information Management and Technology) is a research group within the Leeds University Business School. The group has grown significantly over the last few years to become one of the largest of its kind in Europe, delivering academic research and consultancy services to the private sector, local and national government. As part of a leading international business school in a research led university, AIMTech blends the highest standards of academic rigour with practice oriented research.

#### ABOUT STELJES

Steljes Limited is a technology market development and services organisation. It sources technologies from around the world, develops support services and works with people who use them - in the classroom, in the boardroom, at home or even on the battlefield.

It's been improving the ways in which people live, learn and work for twenty years, working hard to make sure its products really benefit people.

Steljes Limited is a privately owned limited company, which has been operating in the UK comprising five companies, under the strategic direction of Steljes Group.

Steljes is the exclusive representative of SMART Technologies Inc. in the UK and Eire and has increased its UK market segment share from 54.7% in Q4 2006 to 59.2% in Q1 2007, according to figures released by industry analysts Decision Tree Consulting (DTC). Steljes recently shipped its 200,000th SMART Board™ interactive whiteboard.