

# Bowman Digitisation: A Bridge Too Far

by *Dermot Rooney*

*Dermot Rooney is an independent military psychologist and operational analyst, specialising in command system/headquarters design and soldier participation in close combat. He says that the findings of operational analysis for Bowman Digitisation tended to be positive rather than negative, as suggested by Jim Storr, and that the real human problem was a disease called Groupthink.*

I disagree – though only in degree – with Jim Storr’s suggestion in this section that operational analysis for Bowman Digitisation was “*negative or, at best, equivocal*” and with his proposal that the procurement failed due to some amorphous “*human ... organisational, social, cultural, political or bureaucratic*” problem. First, even though the balance of operational analysis findings was negative, the reports based on those findings tended to be positive. Second, it was not due to some vague human problem, but a known and curable disease called ‘Groupthink’.

Groupthink is a phenomenon where “*strivings for unanimity override motivation to realistically appraise alternative courses of action*”. Its effects can be seen in costly failures from the Bay of Pigs to the credit crunch, but Operation Market Garden provides the most useful comparison for Bowman Digitisation. Hardened RUSI-ites will have churned through a dozen books on Market Garden, but I’m hoping that even the most casual reader will have seen the film *A Bridge Too Far*, which gives a reasonable portrayal of the ‘tragedy of errors’ that went to make the Arnhem disaster.

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When Intelligence did not fit the plan, it was redirected, toned down or ignored by almost every level that dealt with it. Montgomery’s rejection of bad-news Intelligence is usually ascribed to his arrogance, but he was reacting in much the same way as nearly everyone else in the planning system: Dutch underground reports were accepted at all levels when they referred to German panic, but distrusted when they emphasised a hardening resistance; ULTRA decryption

was promulgated when formations were withdrawing to Germany, but filed when they were holding in Holland. A plan that seemed unstoppable, an unshakable belief in the power of airborne operations, the pressure to compete with the Americans and Montgomery’s godlike status all worked against objective assessment of Intelligence. If information was passed through the layers of command, then bias was compounded by Chinese whispers.

Where Market Garden planning put filters on Intelligence, the Bowman Digitisation procurement put filters on research. The following is a quick delve into three key pieces of that research to illustrate how these filters worked.

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### **BICS**

In the mid-1990s the Battlefield Information Command and Control System (BICS) was the subject of a study series focused on trials with real staff officers using mocked-up kit. No evidence could be found of any performance improvement over analogue working. Even after repeated attempts over several years it was felt “*unrealistic to expect an unfamiliar system, with a human-computer interface that had not been optimised, to achieve better levels of performance than the familiar manual methods*”. It was also expected that fanciful features like “*artificial intelligence, speech recognition, 3-D landscaping [and] virtual reality*” would somehow resolve the problem before the kit was bought – a ‘jam tomorrow’ illusion common to technology procurement. The main report culminated with a leap of faith to state that the trials “*actually offer evidence that the final fielded BICS would outperform the current manual system*”. No such evidence was documented.

Even this embellishment of facts might give too negative an impression, so the report fell back on some simple computer modelling. In marked contrast to the human trials, modelling suggested that with ideal communications and decision-making, units would be twice as effective. Models also

“showed” that more data had greater benefit than more tanks. These findings were just poorly disguised tautologies – giving computers better data and making them better at using data is bound to make them better at the set task. The simulations had no link to real-world performance – somehow, data held somewhere within a unit would magically enhance every soldier’s understanding of ground truth. In the final BICS report the human trials and modelling assumptions were brushed over and the big computer-generated numbers were touted as a glimpse of the digitised future.

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Hidden in the bowels of the final BICS report was reference to a detailed simulation of Bowman nets which suggested that even moderate data traffic induced significant communication delays at sub-unit level. The inevitable knock-on effect for the computer models’ perfect transmission of understanding was not explored.

**Big Picture 1**

The next big study was Big Picture 1 (1997). A whole armoured squadron was put into a training simulator and given Bowman-like data terminals. Like the imaginary soldiers from BICS models, Big Picture 1 tank commanders could see what their comrades were doing on the other side of the hill. This was the thing that was going to drive the supposed Revolution in Military Affairs (RMA) – everyone having a timely, accurate and precise picture of what all the other good guys were doing would let soldiers fight as one big team rather than a lot of separate small teams.

There was some evidence of this: when attacking there was a 40% reduction in the ‘C2 phase’ (i.e. the time between recce locating the enemy and the squadron launching an attack); in defence, the enemy were destroyed 30% more quickly; overall there was a slight reduction in friendly casualties. Geeks at all levels spouted about self-organisation, mission command returning commanders to “*a form of conflict where situational awareness and timeliness of their orders will not be hindered by physical dispersal.*” (That line was one of mine.) There were a few concerns about the crude simulated world the squadron fought in, but most of us were looking at the stars.

It wasn’t until years later that we realised the main effect

came from effectively giving satellite navigation to soldiers in a simulator where it is incredibly easy to get lost without one.

**Big Picture 2**

Big Picture 2 (2001) was arranged to be a repeat performance. This time real soldiers had real vehicles and fought in a field exercise at BATUS. Unfortunately, the challenge of making, fitting and operating a computer network in old and quirky armoured vehicles in just a few months was too great for the trials team (I was on the team). The kit was barely workable when fitted in turrets. Then the report was a smarmy, long-winded, equivocal compromise between stating the truth, brushing over technical failures and bending to the weight of conventional wisdom (I wrote the report).

Despite these problems, two important points came from Big Picture 2. The first was how difficult it would be for Bowman Digitisation to meet basic ergonomic requirements. For example, vehicle commanders navigated with their heads out of the turret and usually closed down only to fight – so most of the time they couldn’t see the screen and the rest of the time they were too busy to operate it. A hundred other ergonomic straws mounted up and the in-vehicle system was judged to be “*not an act of war*”.

The second point was the importance of quick, reliable and predictable position reports – whether a commander could trust that picture of what all the other good guys were doing. Unlike Big Picture 1, where every vehicle position was updated on every screen every ten seconds, the system we used in Big Picture 2 updated every minute. This was a big difference, but we had no data on how Bowman would use data so we had to guess at a reasonable representation of a fielded system. The real problems came when the update rate dropped off in communication dead spots, or when weight of data traffic slowed everything up.

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Even in the relative comfort of the unit command post the system (which clearly showed where all the good guys were) was seen only as a ‘nice-to-have’. Staff got almost all of their situational awareness from voice reports and paper maps. This was not Luddism or laziness, but a real problem with people not having the brain power to manage digital and analogue systems at the same time. In a standoff between the usable,

robust, near-universal analogue method and the fragile, partial, fingers-and-thumbs digital system, the expensive gadgets lost out.

It is important to note that this kit was not Bowman Digitisation but an emulation. Bowman terminals are a little less bulky, much better fitted and certainly more robust. But the crucial difference between this kit and Bowman Digitisation was that vehicle position reports (the key thing for performance improvement) did not have to come via a sub-unit voice net. We eventually worked out that rather than the consistent ten seconds or the reasonably stable minute, Bowman Digitisation would be lucky to achieve an unpredictable 15-minute update rate.

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Overall, the Big Picture 2 analysis identified an enormous gap between the 'fair crack of the whip' Digitisation was given in earlier studies and the reality of field conditions. Despite the equivocal nature of the report, it did manage to state:

- *"That the level of performance improvement seen in [Big Picture 1] is unlikely with the proposed Bowman-based [data] system".*
- *"That a full scaling of Platform BISA (or other platform-level digitisation) might not be cost-effective given the currently planned communications capability".*

It recommended that a "robust and objective" field trial be conducted to see whether these problems made Bowman Digitisation unworkable "to ensure that investment is not wasted on a product that has little positive impact on operational effectiveness".

No such trial was carried out; the research money got spent on less troublesome computer modelling and lab studies.

**Conclusion**

To summarise, the BICS report argued against one of its bits of bad news, hid another and turned computerised speculation into a good-news headline. Big Picture 1 ignored the flaws in its study design and its uncriticised good news became a clarion call. Big Picture 2 reported bad news that should have been a show stopper, but did this so cautiously that it was able to be overlooked. This wouldn't happen in a perfect world, but in a perfect world we wouldn't drop an airborne division on to a panzer corps. Both failures were down to Groupthink.

For Bowman Digitisation I and a dozen people were told that bad news was "unhelpful", "lacked balance" or "not what the customer ordered". Some desk officers told analysts to be "as objective as you like and we'll cherry pick the bits that support our case". If a research department found bad news then funding could be moved elsewhere. Line managers encouraged underlings to pad out negative findings with reams of positive speculation.

On top of the normal Groupthink factors, bad news had to get past an array of objectivity-suppressing forces:

- A vocal majority with unshakable belief in the power of Digitisation.
- A desperate desire for secure voice at any cost.
- A powerful drive in the Army and MoD desire to keep up with the Joneses (whether other services or the US).
- A procurement system that set services, procurements and departments against each other.
- Departments controlling budgets for research, thereby making their own procurement invulnerable to criticism.
- Plenty of carrots for a smooth procurement, yet no stick for buying the wrong kit.
- No unbiased watchdog with the authority and skills to assess a procurement early enough to do anything about it.

The first three might be excusable, but the last four are not. The system does not have to prove that kit will work, it just has to avoid proof that it will not.

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Today we have Bowman Digitisation that formations aren't use on operations and units ignore on exercises. For no discernable benefit and much unreportable cost, Digitisation has added billions of pounds and millions of man-hours to the cost of a secure radio. Like Market Garden, there are still a few people who hold on to the belief that the procurement was "90% successful", but almost everyone has accepted that we wasted our money and that the next software fix is not going to fix much at all. We got a secure radio and that's fine, but it's too heavy, fragile, complicated and expensive because we tried to buy the Digitisation dream along with it. We stayed in the dream state for far too long because our procurement system is almost designed to promote Groupthink. Until we change it we'll keep buying the wrong kit. ■



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