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Humanising digital change

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INTRODUCTION

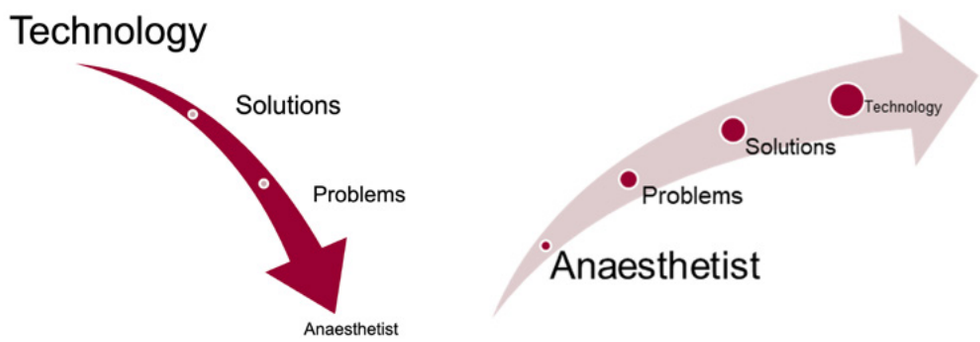
"Technology is nothing. What's important is that you have a faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them."

– Steve Jobs

This article aims to introduce well-known concepts and principles of innovation theory from social science and business and adapt them to the implementation of an Anaesthesia Information Systems (AIMS). This chapter hopes to complement the traditional approach to digital change, which primarily focuses on specific technological solutions, with a focus on the humans who are impacted by the change – anaesthetists. The emphasis here is on connecting with and supporting the anaesthetists impacted by the transition, rather than optimising the technology.

From the moment we wake with phone alarms to the final email before bed, digital threads are woven into the fabric of our everyday lives. For a long time, the sheer scale and cost have been the biggest barriers to embracing the new technology paradigm. However, as we emerge from the disruptions caused by the peak of the COVID-19 pandemic, changes in health policy have created sufficient impetus for organisations to finally undertake digital transition.

Figure 1. Two complementary approaches to technological adoption in anaesthesia



The traditional approach, starting with the available technology, is contrasted against an approach that starts with the anaesthetist at the forefront.

This article is not about the merits of AIMS technology, the ideal system features, or the strategic planning that leads to procurement. Instead, it is a guide to navigating the *process of change execution* from the perspective of the anaesthetist and the anaesthesia department. It focuses on the human experience of digital transformation in the operating theatre and how to effectively deploy AIMS by prioritising the needs and perspectives of the clinical staff. It starts with the end-user and moves to a final goal of a physical solution (Figure 1).

Consider the varied responses to change among anaesthetists. Some, often termed "innovators" or "early adopters", may readily embrace new digital tools. Others, perhaps more experienced practitioners, may be more cautious. Let us illustrate the extremes with some fictional examples:
Sam grew up in the digital age. They are used to seeing patients after gleaning relevant information from digital sources first, and seamlessly switch between recording data and clinical interactions. In general, they are frustrated with the lack of technological progress in healthcare compared with their consumer tools such as smartphones and wearable devices. They are excited about the prospect of local, data-driven decisions in AIMS. Sam is an "innovator".

Alex has practiced anaesthesia for twenty years. They take great pride in being attuned to subtle in-person cues from their patients and thrive in detecting subtle clinical signs. Their notes form an abridged narrative or gestalt. During rounds, they find screens intrusive, impeding their ability to engage fully. They are most concerned about the distractions of digital processes during critical periods and are sceptical of the overall benefit of transitioning from their tried-and-true method of record-keeping. Alex is a "laggard".

It is crucial to dispel negative connotations associated with terms like "laggard". These terms simply describe positions on a continuum of responses to change. While innovators may initiate the push for digital systems, those who are more hesitant play a vital role in grounding the process, highlighting potential issues, and ensuring that the implemented solution is robust and clinically relevant. Effective deployment requires engaging with and valuing the perspectives of *all* users (in this case, anaesthetists), regardless of their initial stance on the technology.

Drawing on Everett Rogers' work on the diffusion of innovation, we recognise that successful change adoption depends on the interplay between the technology, the users, and the cultural context. When deploying an AIMS, the challenge lies in bridging the gap between the early enthusiasts and the majority, including those who are initially resistant. This transition, often referred to as "crossing the chasm", requires addressing the differing needs and concerns of these groups. Our focus here is on how to practically navigate this chasm during the *deployment phase*, ensuring that the human experience remains central.

In his seminal text on innovation, Rogers characterised a range of responses from American farmers to new seed crops. He used these responses to generate the now-familiar adoption curve (Figure 2). Using these findings, he introduced a model of change where the successful adoption of innovation depends on the confluence of technology, the users and the cultural context.[1] In our case, the 20:60:20 rule (20% early adopters, 60% majority, 20% laggards) is a reasonable approximation for the population.[2] When approximately 80% of users are invested in the new technology, the change is effectively normalised as a new paradigm.

Figure 2. Adoption curve

Users are categorised by their propensity to adopt a technological innovation. The area under the curve represents total number of adoptees.

During the height of the 1990s' dot-com boom, Rogers' concepts of innovation were adapted to digital technologies by Geoffrey Moore. Moore recognised that successful technology startups were those who managed to "cross" their products and operations between the innovators and niches into sustained mainstream adoption by the consumer market.[3] He described this transition in terms of the "chasm" (Figure 3) because he recognised that the biggest transition for technology was satisfying the differing needs of the early group (pre-chasm) and the majority (post-chasm). By crossing the gulf of requirements between the early adopter and the majority, an innovation will have crossed the major barrier to being the new norm. One of the reasons Apple™ has been so successful in consumer electronics is its ability to bridge this chasm for multiple devices.[4]

Figure 3. The chasm of adoption

Before we go on, we must dispel the unfortunate connotations of the common lexicon and recognise value in both innovators and laggards. Rogers used these terms arbitrarily to define a continuum of experiences. While change may begin with innovators and early adopters, it is the laggards who stop frothy speculation. They temper the momentum to chase after shiny new projects before operationalising existing ones. A challenge for leaders of departments is balancing the opinions of all people on the adoption curve in setting the choice and pace of change.

Our scenario with an AIMS is not different to any other technological paradigm. Most clinicians are aware of the benefits of digital health. Measurable improvements in patient safety, remuneration and operational efficiency, as well as data for research,[5] make compelling reasons for organisational change. Beyond the early adopters, however, most clinicians grapple with the conflict of collecting objective data against our expertly honed, holistic clinical opinion. Relentless screens of checkboxes and text walls can give rise to fears that the importance of clinical expertise will be diminished.[6] Schwartz reports that anaesthesia records are not simply a collection of objective data points but are our subjective narrative view of a unique physiologic experiment in real-time.[7] Because of this, many see our paper anaesthesia record as a symbolic reflection of us as clinicians and practitioners of a craft. Even with the ability to digitally record narrative notes, there is a fear that data can be reviewed without adequate recognition of our interpretations of rich, ambiguous and unrecordable clinical signs. Opposing AIMS implementation may seem the only way to resist an invasion of faceless, digital bureaucracy forming a Kafkaesque nightmare of inhuman healthcare. Further sowing seeds of distrust and disengagement are the multinational technology vendors for AIMS, as well as the cynicism that accompanies the medical-industrial complex. For the clinicians who are most affected by technological shifts, there is growing scepticism about whether the innovations of AIMS can fundamentally transform healthcare outcomes for the better.

APPROACH

With these factors in mind, an approach can be taken to address the human concerns of the anaesthesia cohort, as the primary tool for instigating and sustainably creating change. Engagement and trust from anaesthetists in developing and adopting the new paradigm is needed. From the ideas presented above, the following framework could be used when implementing AIMS in new organisations:

1. Communicate for alignment.
2. Find champions *and* connectors.
3. Start simple.
4. Collect data.
5. Keep learning.

Communicate for alignment

The phenomenon of messaging only the positive impact of change is self-evident in many examples in our own lives – we have all heard the trumpeting cries of why change is better from real estate agents, salespeople, and political campaigns. While it is important to communicate the advantages, it is tempting to focus solely on the positives. Upsides mainly seek to draw the interest of early adopters, while everyone else is more inclined to focus on the downsides. There is a commonly held view that the more information that is given about benefits, the more positive the engagement will be from the end-users. It is, however, quite the contrary. With AIMS implementation, the positives are often the subject of an organisational-wide campaign for awareness. Yet there is often plenty of scepticism about this unambiguously rosy outlook. We hear feedback such as:

We don't even have working computers in theatre.

They don't care that we have to spend thirty minutes writing notes before induction.

What will happen when there is a power outage?

Knowing this, reframing messaging away from "pros and cons" towards *alignment* can be very useful. Instead of re-stating *what* is going to change, it can be helpful to create questions about *how* the technology could be fit for purpose in the specific workplace. This aims to bring critical voices into the solution about how best to implement the change in each specific organisation. For example, the perceived inefficiency of digital records in an endoscopy suite, or other surgical lists where fast patient turnover is essential for efficient patient care, needs to be specifically addressed. It is necessary to first acknowledge that there could be settings where digital records slow the turnover of patients *before* working on a solution. From there, the team can find solutions – such as having the patient records started before patient arrival, which may allow for a more efficient flow of patients undergoing relatively simple and short-duration procedures. This can then be tested and refined in teaching materials at the time of implementation. Early direct involvement of the team undertaking the lists means that complaints regarding slower patient turnover due to AIMS can be minimised.

Find champions *and* connectors

One of the key psychological features of change is fear or anxiety about the uncertainty in the new paradigm. When faced with this uncertainty, our general instinct is to reach for simple black-and-white (yes/no) solutions. As well as reframing discussions away from binary outcomes toward collective alignment, we can also create champions and connectors. In order to engage those who are threatened, we need agents with whom high levels of trust exist. For us, these take the form of champions and connectors.

"Champions" are those who are seen to be experts; they often hold symbols of authority such as titles or degrees and are acknowledged as being "competent" in at least one relevant domain (technology or anaesthesia). They can be trusted to solve problems and explore areas of technical complication. Champions are essential for initial engagement and to confer some external validity to what is being done. Champions often come from the innovators or early majority group and may be the initiators of implementing an AIMS. However, they can also be intimidating if their passion is expressed without acknowledging or respecting broader hesitation from the rest of the potential adopters, which can create distance or mistrust if they are

perceived to be misaligned in other ways to the majority. It is therefore essential to avoid creating further distance from champions by being judicious in the use of jargon, titles, and decrees.

"Connectors" on the other hand, are those who conform to many of the behaviours and attitudes of the majority but are still aligned with the change. They are crucial in helping to bridge the gap across the chasm between innovators and the majority because their trust is created by other similarities and inclusion with the majority. They interact with a broad cross-section of the change cohort. Early in the implementation of an AIMS project, it is important that a balance of champions and connectors be intimately involved. Because connectors give input early, their voices can reflect the wider group's more conservative and reserved members at the outset. At this time, by representing the concerns and apprehensions of the group, their trust and inclusion can be further enhanced, especially if it differs from the organisational edict. Towards the end of the project, as the connectors become more confident of the changes and eventual outcomes, their endorsement can be seen as a considered choice representing the more cautious majority, rather than a dictum of authority.

Start simple

Technology products often begin with a minimum viable product – the most basic version that does the minimum required for the purpose it was designed for. For AIMS implementation, we may instead design a system that deviates the least from existing workflows. While early adopters appreciate flexibility and features in AIMS, the majority is far more comfortable with fewer features and options, as an increase in choice can be bewildering. This can be particularly relevant if there are other, less desirable changes occurring at the same time. If there is too much net change, the new system's benefits may be ignored while users spend time dealing with the less familiar and desirable aspects of the change. Over time, as familiarity increases, it may be possible to add features in a slow and considered way to improve functionality.

In many cases of AIMS implementation, vendors present the organisation with an overwhelming array of customisations. In many AIMS, commonly used anaesthesia tools such as drugs (propofol), procedures (airway management) and monitoring (blood pressure) can be packaged and customised. While it is possible to implement user-level customisations from the outset, it may instead be better to create global packages that cover the majority of surgical cases so that most users (the anaesthesia providers) have a more streamlined approach to using AIMS. Knowing the needs of the cohort for "essential" compared to "elective" options will help discern the level of initial customisation. Over time, requests for further customisation may occur, but these are usually non-urgent and can be prioritised after other support and essential fixes.

Collect meta-data

To complement "starting simple" is the idea of iteration. In order to create a sustained virtuous cycle of improvement, we must collect data on users' attitudes and the usage of parts of systems – meta-data. Before, during and after the project, this can take the form of a "temperature check" survey. In these, staff can qualify and quantify their engagement, involvement and inclination toward the change. With this information, it is possible to adjust the strategies used during the deployment of AIMS. When pre-implementation meta-data reveals a lack of engagement with online learning, changes can be made, such as appeals to management for extra staffing support during the week of implementation (Go-Live). A post-Go-Live survey can then be used to document the impact of these extra support hours, hopefully showing that this staffing increase made the most qualitative difference in the attitude of staff to the project.

Conversely, one of the biggest impediments to further improvements after AIMS implementation can be the lack of access to usage meta-data. Knowing how much time users spend engaging with each part of the AIMS may lead to insights about pain points in the user experience. These insights can lead to changes that make common tasks more efficient and effective. However, data extraction for this usage can be challenging and may require collaboration with institutional digital teams and technology vendors. Without these data there can be reduced ability to pre-emptively make changes to the AIMS system before they become clinically problematic. As it stands, many organisations still rely on less accurate and inefficient, informal channels for feedback.

Keep learning

The sustained acceptance of AIMS is also facilitated by an ability to adapt and keep learning. As leaders, we must recognise that our knowledge at the outset of a change project such as AIMS is going to be different in the target state. As we progress, new problems and solutions may become evident, and therefore there must be a mechanism to review and modify previous decisions. In the corporate world, a leader in this field is Amazon™. They have relentlessly pursued a strategy based on the idea of a "Day 1 company". Amazon™ culture is one centred on the experiences of their customers.[8] In AIMS, our "customers" are our users (anaesthesia providers). To create enduring value from AIMS, staff need to give feedback to organisational leadership, and then the leaders must translate these learnings to changes in AIMS. This means that a key attribute of change leadership is to live in the discomfort of uncertainty and to support the rest of the cohort through the same.

The most significant barrier can sometimes be that anaesthesia departments are nestled within the culture and operations of larger healthcare organisations. For AIMS leaders, the ability to manage up and down the organisational ladder is crucial. They need to remain open to the possibilities presented by users and work to constantly understand their feedback. Leaders should always look for alternative solutions rather than dismiss how suggestions can't or won't work in the organisation. When there are larger forces dictating changes, it is important to hear why concerns exist and look for workarounds where possible. Where there is a mismatch between what the organisational process requires and what the users want, leaders must work hard to bridge the gap. This doesn't mean taking sides in the debate but facilitating communication between the teams that generate policy and those that deliver and exist within them.

CONCLUSION

It is important to recognise that digital change is just one aspect of greater societal change. We may be on the cusp of a major paradigm shift in the Anthropocene. Climate, geopolitics, artificial intelligence and autonomy, as well as policy and demographics,[9] are all likely to have significant ramifications for the next generation of anaesthetists. Knowing how change occurs in the AIMS setting can be the template for other changes in the future. We must be courageous enough to acknowledge our own limitations, weaknesses and errors, and constantly seek out ways to learn from colleagues, trainees and patients, as well as from sources outside our industry. We should consider our decisions with the benefit of a broad spectrum of lessons. We can better create solutions by listening and understanding who is being asked to change. Change is not what happens to people, it is what is brought about by people.

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