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Robocops: Securing the Cities of Tomorrow

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Synopsis

Robotics offers huge potential for law enforcement in the face of new challenges and resource constraints. Nonetheless, there are organisational, operational and societal implications that the technology might bring.

Commentary

IN JULY 2016, the Dallas Police deployed a bomb disposal robot to deliver an explosive device to neutralise a shooter. The decision to weaponise a non-lethal robot was deemed necessary as other options to subdue the shooter would have resulted in more casualties. The lethal application of robots in law enforcement was reportedly unprecedented. It understandably drew profound interest not dissimilar from the military domain when such technology gained importance for offensive applications.

The operational and ethical issues stemming from the Dallas situation would be of greater relevance to countries afflicted with gun violence. For those with low crime rates, the Dallas incident presages the future of law enforcement where robots could play an integral role across the spectrum of operational functions.

Here Come Robocops

Robotics is increasingly adopted in countries which have embraced emerging technologies for smart cities initiatives, supporting a range of public-facing services including law enforcement. Research in artificial intelligence (AI) by Stanford University noted that improvements in hardware will innovate robots over the next 15

years. The World Economic Forum expects the robotics market to grow at a rate of 17% annually; and robots will be deployed in many areas of works in future.

In Singapore, robots are being piloted in various sectors; Ngee Ann Polytechnic in 2012 collaborated with the Singapore Police Force to develop a prototype Pole Climbing Robot that could deploy surveillance cameras to monitor public order situation in crowded places.

With the exponential pace of advances in AI and Internet of Things (IoT), the robots of tomorrow will be cost-efficient, functionally versatile, and capable of collaborating with human personnel. Organisations could look forward to the technology to overcome their resource constraints and enhance efficiency. Indeed, cost efficiency and functional versatility are the selling points of the latest models of security robots introduced to the market; and there will certainly be other potential benefits yet to be discovered.

The Robotic Adjutant

A feasible approach for technology adoption would be collaboration whereby robots complement human personnel in frontline duties. A paper on 'Smart Monitoring of Complex Public Scenes: Collaboration between Human Guards, Security Network and Robotic Platforms' by the US Department of Homeland Security outlines this approach. Robots interact with human personnel in performing two primary duties; patrolling for deterrence and surveillance; and gathering information on threats to support decision-making.

The designs of the latest models of robots in the market appear to affirm this approach. Chinese robotics developer Qihan unveiled 'Sanbot' which is capable of performing mobile video surveillance, interfacing with the IoT architecture, and self-recharging for 24/7 operation. American robotics developer Gamma2Robotics unveiled 'Ramsee' which is described as 'ideally suited for overnight dull, dirty and dangerous patrols nobody wants to do'.

Harnessing Robots – Issues and Challenges

Harnessing robots in law enforcement brings about challenges and issues including those which may be unintended and unexpected.

At the organisational level, human-machine interface issues need to be addressed given their complex ramifications on the human personnel's adaptation to new technology, their attitudes and productivity. A different skillset and business process reengineering would ensure proper integration of robots into the organisation.

At the operational level, an appreciation of the social context and attitudes of people when robots are present is necessary for frontline deployment of robots; lest they hamper rather than support their human partners. For example, research (i.e. "mObi" robot) in this area by New-York based Cornell University hitherto observes that robot guards have to be paired with a human for there to be any discernible deterrent effects; as long as the capability of robots is strictly surveillance rather than interventionist.

Even if the robots are unarmed or limited to non-lethal weapons, issues of supervisory and legal accountability with impact on public trust could arise if there is unexpected injury to the public resulting from non-lethal intervention (such as cardiac arrest when tasered) or technical glitches (such as driverless car accident) with the robots.

At the societal level, a calibrated implementation of robots which factors in grassroots feedback could address the concern of technology isolating the users from the community. Robots, although non-human, could in fact support community policing by enhancing service touchpoints. A precedent is the automation of neighbourhood police posts in Singapore where fully automated e-kiosks free police officers from desk duties for them to spend more time fighting crime.

The use of robots at service touchpoints however could give rise to concerns over privacy breaches. This must be addressed from the cybersecurity and operational angles given the robots' mobile surveillance capabilities. These may be seen as more creeping compared to static CCTV cameras, and collection of personal data in its interactions with the community. The plausible risks from cyberattacks that compromise robots include personal data theft, and commandeering of the robots for launching malicious attacks and surveillance.

Additional Considerations for the Future

The nature of crime and public security will evolve as growing urbanisation introduces changes to the demography, landscape and socio-economic character of cities. Police forces will need to reshape their technical tools (such as surveillance and community outreach) and protocols to sustain an adequate police-to-population ratio, efficient incident response, and public trust. These need to be considered as they grapple with imminent manpower constraints and new operational challenges.

Embracing robotics for staffing needs would be a strategic imperative for forward-thinking police forces as they seek to sustain their operational efficacy. While a fully autonomous 'Robocop' with a mind of its own and enforcement capabilities is likely to remain in the realm of popular culture in the foreseeable future, the role of robots in law enforcement is a certainty given the increasing pace of automation among police forces and growing pervasiveness of the technology in the public landscape.

Therefore, the evaluation of cutting edge robots and research on technical, cost and cybersecurity implications are needed. Proper integration of robots into the organisation will also require changes in organisational culture, strategies and processes. The organisational, operational and societal challenges associated with technology amid an evolving urban operating environment demand these.

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