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Better Utilization of Available Police Manpower: Enhancing Efficiency and Effectiveness through Technological Means to Control Crimes

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Abstract

Underutilization of personnel in police forces is a widespread problem that undermines the effectiveness of law enforcement agencies worldwide. This article explores the multifaceted factors of this situation and suggests technological solutions to increase the operational efficiency of the police in Pakistan. Political interference often leads to the misuse of police resources for ineffective purposes, whilst corruption in power leads to misallocation of duties and low morale. Poor management and inadequate comprehensive training facilities hinder the development and deployment of officers, preventing them from reaching their full potential. Additionally, a lack of resources and modern technology hampers the police's ability to effectively control crime and protect public safety. Advanced data analytics like digital evidence management, bomb disposal robots, radio communication systems, satellite and vehicle tracking systems (GPS), biometric verification devices, social media monitoring, open-source intelligence (OSINT), mobile data terminals, etc., can optimize the workforce by providing real-time information on crime trends and resource needs, ensuring staff are allocated where they are most needed. In addition, the adoption of body-worn cameras and automated reporting systems can increase transparency, reduce opportunities for corruption, and increase accountability and public trust. Continuous professional development and performance-based assignments can motivate officers and ensure they have the skills necessary to use new technologies effectively. Integrating these technological solutions requires a legal and regulatory framework to support reducing political barriers and ensuring accountability. Establishing independent oversight bodies and anti-corruption units within the police force can improve the integrity and effectiveness of operations. These technological measures, along with legal reform and strong regulation, can change the face of policing by ensuring that the workforce is fully empowered to maintain public safety and uphold the rule of law.

Keywords: underutilization, manpower, police forces, technology, operational efficiency

1. Introduction:

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Pakistani police are underdeveloped, unarmed, affected by politics, and corrupt (Abbas, 2009; Ogunlana et al., 2003). The authority's incapacity to maximise policing resources is the main cause of this situation. Amusingly, policymakers, legislators, and the military have never concentrated on the police department despite internal unrest, ethnic tensions, and prejudices since 1947, a major increase in crimes, and revolt. The Pakistani police's ability to control terrorism is underrated. In the 1990s, the police improved and showed solidarity, but some rigorous fear-based oppressor organisations in Punjab also defeated the psychological warfare conditions in Karachi, where political support and resources were available (Abbas, 2011). Pakistan has had over 30,000 terrorist victims, and in 2010, 2,250 civilians and security forces died in a terrorist strike. Although religious leaders who questioned dictators, politicians linked with developing political parties, and innocent people were the major victims, police officers were increasingly targeted. Terrorists say police and troops are their worst foes. Insufficient resources, professional training, and equipment and gadgets make it difficult for the police force to change the methods and policies of terrorist groups (Waters & Ussery, 2007). Pakistani police have often failed to maintain peace, hence they are declining in their security and protection duties. A panic episode at an Army Public School prompted the military to confront terrorists.

Lack of modern investigation tools, expertise, and resources has prevented Pakistan's legal system from developing anti-terrorism initiatives. For the same reason, non-terrorism crimes have also increased in recent years. Police forces are dominated by legal and orderly duties and VIP security (Shah, 2018). Without intelligence services, police efficiency and effectiveness suffer. Corruption, bigotry, and political fraud are eroding police and community dignity. Pakistani courts' inefficiency hinders criminal law implementation (Ahmad et al., 2014). To effectively manage law enforcement, one must understand labor supply finances. Pay rates and work-related costs dominate police division and related office funding. Due to limited municipal and state government funds, there is a growing interest in optimizing manpower resources to minimize police protection costs and boost efficiency. This article discusses police underutilization, suggests qualitative improvements, and highlights crucial internal and external challenges. Inconsistent law enforcement characters can be harmful. Coordinating a disproportionate share of available resources for police activities at the expense of other framework sections produces court bottlenecks and cripples remedial organizations. Thus, police labor supply underutilization might be attributed to police association construction and board rehearsals within the law enforcement framework. Prioritize qualitative improvements over quantitative increases in police strength to maximize manpower use. Strategic troop deployment and efficient command structures under Interior Ministry supervision can achieve this. Verbalize public-level tactics and goals that match local police activity to bridge the gap between theory and practice. Clear guidelines and headers help police divisions execute these arrangements consistently. Through internet channels, police may better regulate crimes with tighter system integration. Working collaboratively to identify bottlenecks helps officers reduce crime. By replacing all digital infrastructure with new methods and adjustments, progressive improvement is possible. Military conflicts may replace police action, causing high-profile fatalities and deprivation of basic liberties. Maltreatment by force is useless. Most soldiers, including those in the country, are unprepared to handle internal law and order issues. Fighters should be ready to assist police if needed (Neild, 2001). The report examines the strength and effectiveness of Pakistani law firms in fighting terrorism, focusing on law enforcement agencies like all police departments (provinces and organs of state), several investigation units, Special Forces (including military units that support policing), and intelligence services that share

information with the police. The police force is a state's main law enforcement agency, yet it cannot be administered alone (Kraska, 2001). Work perspectives that emphasise recognition, responsibility, achievement, work, development, and advancement can motivate cops. Cleaning elements include the gig itself. Work circumstances, security, policy, management, peer relationships, remuneration, and officer relationships affect cleanliness. Cleanliness and inspiration can reduce frustration and poor performance, and police labour can be reduced (Herzberg et al., 1993).

1.1 Significance of the Study:

Police in Pakistan, where modern security tactics are limited, have considerable hurdles, as the study shows. It focuses on law enforcement inefficiencies and understaffing, which endangers public safety. The report aims to assist policymakers and police administrators worldwide by highlighting manpower challenges like inefficient recruitment practices and training. By recommending measures for better resource allocation and operational performance, the study intends to strengthen the Pakistani police force. It also emphasises the necessity of digital technology to improve staff utilisation and operational effectiveness, filling a vacuum in policing literature. The lessons learned may help other developing nations with comparable issues, improving public safety worldwide.

1.2 Research Questions:

I. Key factors contributing to the under-utilization of police manpower in Pakistan, as identified in existing literature

In Pakistan, police manpower underutilisation is caused by many variables, according to literature. Staffing shortages, lack of training, inefficient management practices, misallocation of resources, political interference, corruption, ethical/moral concerns, bureaucratic constraints, inadequate infrastructure/equipment, overburdened, and community-police distrust are key factors.

Political Intervention, because politicians utilise police for personal gain, misusing people and resources and making police unjust. Corruption and ethical abuses in the police force have led to the misallocation of jobs, with personnel chosen for favours or bribes instead of operational needs. Inefficient management and training leave cops unprepared, resulting in inefficient police use. Insufficient resources (modern technology, equipment, and facilities) hinder police manpower use. Bureaucratic/administrative limitations reduce police decision-making and operational effectiveness, delaying action and reducing responsibility. Police officers with low morale/motivation have bad working conditions, little recognition, and low salaries, contributing to underutilisation. Disappointed police officers work less diligently and effectively. Without a good performance review system, cops aren't held accountable. This lack of culpability has caused frustration and police force underperformance. The country's police are typically overburdened with non-criminal work (administrative and VIP protocol) outside law enforcement, which reduces their effectiveness and focus.

Studies show that insufficient staffing, training, and resource distribution hinder legislation implementation. Insufficient infrastructure, equipment, operational inefficiency, and community-police interaction hamper trust-building and cooperation. However, to overcome these obstacles, widespread reforms that improve training and/or resources, eliminate political and bureaucratic interference, and promote police force management practices that improve

ability and professionalism are needed. Police officers are often exposed to extreme negative emotions, thus they require effective ways to regulate them. These WHMDs can track officers' heart rate, weariness, emergency alert, etc. A time-staggered design with a waitlist control condition assessed officers' emotion-regulation skills after training. Results show that police have more trouble accepting and enduring unpleasant feelings, supporting themselves in stressful conditions, and facing emotionally tough situations than controls. The training greatly improved skill application, especially for officers who struggled. These findings suggest that police officer mental-health prevention programmes should emphasise emotion-regulation abilities (Berking et al., 2010).

II. The consequences of inadequate training and low salaries on the performance and effectiveness of police officers in Pakistan

Pakistani police officers may perform poorly due to inadequate training and lower compensation. These include decreased professionalism, decision-making, corruption, misconduct, human rights violations, morale and motivation, and police retention issues. Modern policing is adopting innovative technology. Officers struggle to use these instruments without training, hindering investigations and efficiency. Lack of training inhibits officers' ability to handle difficult situations, eroding integrity and professionalism and making police researching other ways to make money. Low compensation can lead to unethical behaviour, unprofessional conduct, integrity compromise, stress, and mental health issues, thus officers are departing for better-paying jobs. Low morale and motivation cause turnover and brain drain. To attract skilled cops, attractive pay are essential. Cybercrime, organised crime, and terrorism are complicated crimes that might lead to poor investigation findings without specialised training and legal expertise for police officers.

The situation needs comprehensive reforms that focus on cybercrime, human rights, and community policing training, decreasing alienation, improving compensation and benefits, and promoting law enforcement professionalism and accountability. Policing's obligations and risks require attractive wages. This will reduce corruption and maximise talent. Psychological support is also needed to improve police well-being and performance. Pakistan may improve law enforcement performance and public safety by investing in police officer training and well-being.

Police have little time for training. Thus, learning must be maximised in the available time. High-quality police training is not guaranteed. Police teachers are driven to succeed and feel obligated to teach their recruits. Dialectical and pedagogical abilities are often disregarded in training. Studies demonstrate officer training can be improved. The authors prepared this chapter for police training practitioners and believe the criteria will assist their work and help them demonstrate their practical experience and motivation to give exceptional training with scientifically sound standards. They define high-quality police training dialectically. They consider learning as a process that produces relatively stable behavioural changes (potential) due to environmental interactions. They consider talents gained when they are retained and transferable. They use research on skill acquisition, motor learning, pressure, and motivation to set criteria. They are usually (but not only) used to learn perceptual-motor skills like use-of-force and de-escalation, decision-making and acting, and integrated skills like scenario training. The criteria can be used to create or prepare training, guide teachers, and evaluate and monitor dialectical quality (Hutter et al., 2023).

III: The current organizational structures and management practices within the Pakistani police force that hinder the effective utilization of manpower?

Pakistan's police force suffers many organisational and management issues that hamper its use. Poor coordination, upper-level command structure/centralized decision-making, bureaucratic red tape causing selective law implementation, political interference, lack of performance and accountability, lack of innovation and modern weaponry/techniques/training and capacity building, outdated management systems, lack of appreciation/reward system, poor infrastructure, and shortages of vehicles, communication equipment, and forensic tools all contribute to These issues diminish police agility, reactivity, and professionalism, delaying decision-making, disorganising resource distribution, and reducing operational efficiency. Accountability, decentralisation, Rule of Law, training and capacity building, and resource restrictions should be addressed to tackle these difficulties.

Pakistan can optimise police manpower and improve public safety, security, and trust in law enforcement institutions by implementing reforms to streamline decision-making processes, such as transparency and accountability, and investing in training (Update Training Programs) and resources by increasing funding and adopting integrated technology.

III. Does the strategic deployment of digital technology in policing contribute to workforce optimization?

Police can optimise working capacity and operational performance by using digital technologies wisely. Data-driven intelligence, predictive analysis, and real-time investigation from Real-Time Crime Centers assist police departments send technical officers to regions of highest need to improve crime response times. Installing advanced data analytics, modern communications tools, and surveillance technologies like computer-aided dispatch (CAD), criminal record management system (CRMS), Facial Recognition Systems, Drone Surveillance, automated fingerprint identification system (AFIS), digital forensics, GIS, Mobile Police Applications, Cybercrime Investigation Tools, DNA Profiling, Digital Forensics, etc.

Police agencies may modernise administration, automate repetitive activities, and increase officer communication and collaboration via digital technology. This allows police focus on essential policing rather than administrative tasks, resulting in a well-organised manpower allocation. Police employ digital technology to optimise their staff, improve operational efficiency, and better serve their communities. Law enforcement can adapt to changing crime challenges and improve public safety by embracing innovation and technology.

V. Main qualitative improvements in law enforcement through the introduction of digital technology?

Law enforcement has improved in many ways since adopting digital technology. Advanced data analysis helps organisations identify crime data kinds and trends for more focused and effective crime prevention. Gathering intelligence from several sources helps agencies spot and address emerging risks, boosting security. Digital communications systems enable interagency collaboration and Social Media Intelligence (SOCMINT) to solve complicated crime situations. Increasing online and social media public gatherings may create trust, respect, and crime control support.

Police officers may focus more on enquiries and investigations with simplified procedures and autonomous administrative tasks. Higher transparency and better reporting mechanisms increase trust in law enforcement, and digital technology helps agencies control/manage data, encourage collaboration, involve communities, facilitate operations, and improve officer health and safety for effective and responsible policing.

VI. The challenges of transition from traditional to digital policing approach

The shift from traditional policing to digital policing has many obstacles, particularly in manpower utilisation and organisational change. Staff training/skills shortages, resistance to change, interoperability and integration challenges, data privacy/security issues, resource restrictions, and law enforcement agency culture differences are examples. To maximise police operational efficiency, proper employee training/upskilling, fostering a culture of modernisation and adaptability, ensuring unified digital technology integration, implementing data privacy and security measures, and providing appropriate technology resources are needed. A successful digital policing transformation demands strong leadership and change management. Leaders must explain the benefits of digital technology, resolve employee concerns, and encourage innovation. A collaborative decision-making process that puts employees at the forefront of digital initiative design and implementation can boost commitment and ownership. To ensure digital technology integration, constant evaluation and feedback systems are needed to track progress, identify issues, and make necessary adjustments.

VII. Adoption of artificial intelligence (AI) technology to address modern challenges in crime prevention and detection

Modern crime prevention and detection require AI-based technologies like AI-based predictive policing and crime forecasting, AACA, AWR, FRSI, APVA, and others. AI, data analytics, CAD, and GIS help police agencies identify developing risks, follow criminal networks, and watch criminal activity. PPAs use data analysis to predict crime hotspots and allocate resources to deter crime. The Punjab Forensic Science Agency (PFSA) digital forensics and cybersecurity fight cybercrime, identity theft, and fraud using advanced digital technology. Information-sharing networks enable interagency operations and coordinated responses to transnational criminal syndicates and emerging threats. This will benefit investigations by offering access to massive volumes of data, enabling cross-referencing, and enabling speedy information distribution. Thus, with digital technology, law enforcement organisations may better prevent and detect crime, safeguard communities, and maintain the law in a more complicated and linked world.

VIII. How do budgetary constraints and technological developments affect the adoption of digital solutions in policing?

Budget constraints and technology advances determine which digital solutions law enforcement organisations prioritise and adopt. Limited budgets limit the department's technological investment, therefore it prioritises cost-effective, fast solutions. New technology always introduces new alternatives, forcing agencies to evaluate their merits and compatibility with existing systems. Choosing solutions that promote crime prevention and operational efficiency is crucial to agencies' ROI. Prioritisation and operation are also influenced by compatibility with other agencies' systems, training resources, and public faith in technology. To make educated decisions

that improve police, organisations must balance financial restrictions with digital solution advantages and compatibility. To support efficient operations and data exchange between departments and agencies, digital solutions must smoothly interact with these systems. Prioritising interoperable and compatible technology maximises productivity and minimises workflow interruptions. To ensure long-term sustainability and value for their investment, agencies must evaluate digital solution scalability to accommodate future expansion and technological improvements.

IX. Perceptions and experiences of practitioners regarding the utilization of surveillance-oriented security technologies (SOSTs) in smart city initiatives

Practitioners' perceptions and experiences regarding the utilization of surveillance-oriented security technologies (SOSTs) in smart city initiatives include Safe City System, CCTV, Radio Frequency Identification, Automatic Number Plate Recognition, IoT, CoT, GPS, GIS, OSINT, SOCMINT,DNA profiling, National Forensics Agency, Criminal Record Management System, CAD, Records Management System, Mobile Data Computer, Automatic Vehicle Location System, E-Challan, Body-Worn Camera, Drones, Digital Evidence Management System, Open-Source Intelligence, Machine Learning, AI, Automated Facial Detection, Facial Recognition Technology, Integrated Ballistic Identification System, Real-Time Crime Center, Counter Terrorism Department, Integrated Command and Control Center, Long-Term Evolution (LTE) also called 4G police communications), Voice over Internet Protocol, NADRA access, Federal Investigation Agency, Document Management System, Emergency Management System Police Fingerprint Identification System and Surveillance-Oriented Security Technologies can improve overall performance, policy considerations and inform future prospects of the department in several ways.

SOST practitioners' perspectives on smart city efforts might inform future applications and legislation. Privacy, civil liberties, enforcement, community engagement, and regulatory frameworks can be addressed by policymakers and stakeholders to responsibly and ethically deploy surveillance-oriented security technologies to improve public safety and security in smart cities.

3. Statement of the Problem

Pakistan's police force faces persistent underutilization of manpower, limiting its ability to combat terrorism, maintain law and order, and respond effectively to internal and external security challenges. This problem stems from inconsistent recruitment policies, political interference in appointments and promotions, inadequate training, poor resource allocation, weak accountability, and low salaries that contribute to corruption and reduced motivation. Although digital technologies have the potential to improve personnel deployment, operational efficiency, and decision-making, their implementation remains limited and fragmented. This study examines how digital technologies can improve police manpower utilization and operational effectiveness in Pakistan while identifying the institutional and technological barriers that hinder their successful adoption.

4. Better Utilization of the Police Force

Effective utilization of police manpower requires institutional reforms, merit-based management, technological integration, and improved accountability. Rather than expanding

the size of the force, emphasis should be placed on deploying existing personnel more efficiently through evidence-based planning and organizational reforms.

a) Data-driven deployment

Police deployment should be based on crime patterns, population density, workload, and geographical needs instead of routine administrative practices. Data analytics, Geographic Information Systems (GIS), and crime mapping can support patrol planning, optimize resource allocation, and improve operational effectiveness. Continuous professional development in leadership, crisis management, and technical skills further strengthens police performance.

b) Merit-based performance management

Assignments, promotions, and transfers should be based on measurable performance indicators and professional competence rather than political influence. An independent evaluation body can monitor appointments and promotions, ensuring merit-based decision-making and protecting the police service from external interference.

c) Legal and institutional reforms

Police reforms should reinforce institutional independence by clearly limiting political interference in policing. Establishing an independent Anti-Corruption Unit with investigative and enforcement powers would reduce corruption, improve integrity, and strengthen public confidence in law enforcement.

d) Transparency and continuous training

Transparency can be enhanced through regular publication of performance reports, public disclosure of departmental expenditures, body-worn cameras (BWCs), and automated reporting systems. Police training curricula should be continuously updated to include emerging technologies, modern investigative techniques, and community-oriented policing to improve operational effectiveness.

e) Resource allocation and community policing

Adequate funding, modern equipment, reliable communication systems, and improved transportation are essential for effective policing. Community policing initiatives, including neighborhood watch programs, community liaison officers, and public safety meetings, can strengthen cooperation between police and citizens. Public awareness campaigns can further improve public understanding of policing responsibilities and encourage community participation in crime prevention.

f) Accountability and manpower management

Effective accountability mechanisms are essential for improving police performance and ethical conduct. Establishing an independent complaints commission supported by artificial intelligence (AI) chatbots and virtual assistants could facilitate complaint registration, case management, and transparent investigations.

Coleman (1970) identified three key principles for efficient manpower utilization:

- Effective use of specialist personnel.
- Appropriate use of cadets, reserve officers, and civilian staff.
- Better development and utilization of field intelligence sources.

Similarly, the **management-by-objectives** approach divides complex policing responsibilities into measurable goals and evaluates performance against predefined targets. This model has been successfully used to assess and reorganize police departments in California (McCrea, 1980).

Despite having a substantial workforce, Pakistan's police continue to face operational inefficiencies due to inconsistent recruitment policies, political appointments, inadequate training, and unclear job responsibilities (Reuss-Ianni, 2017). Frequent policy changes with successive governments often result in excessive recruitment without corresponding workforce planning. Political interference further undermines merit, while insufficient training limits officers' effectiveness. Organizational reform and clearly defined job roles are therefore essential for improving workforce productivity (Buckley & Caple, 2009).

g) Strategic manpower planning

Efficient manpower planning requires balancing personnel strength with operational requirements and available financial resources. Poor workforce allocation increases salary expenditures without improving service delivery. Proper manpower planning can optimize recruitment, reduce unnecessary staffing, and improve budget utilization (Tengpongsthorn, 2017).

Low salaries remain a significant contributor to corruption within Pakistan's police service. Increased investment in personnel, equipment, and operational resources can improve organizational performance and public safety (Boulton et al., 2017). Rather than increasing police numbers, reforms should prioritize improving deployment practices, command structures, and workforce management. National policy leadership by the Ministry of Interior is essential to ensure consistent implementation of these reforms (Maynard-Moody & Musheno, 2000).

h) Lessons from international practice

Research from Great Britain demonstrates that police resources are often used inefficiently because inexperienced officers are assigned to frontline duties, excessive time is devoted to administrative work, and personnel are allocated according to geography rather than operational priorities. Increased specialization may also weaken police-community interaction. Improving police effectiveness therefore requires aligning organizational structures with operational demands and public expectations (Mastrofski et al., 1996).

5. Adopting Technology to Improve Police Efficiency

Digital technologies have become essential for improving police efficiency, accountability, and evidence-based decision-making. Their effective implementation can optimize resource allocation, enhance operational coordination, and improve public service delivery.

a) Computer-aided dispatch and operational management

Computer-Aided Dispatch (CAD) systems provide valuable information on police service demands, enabling more efficient deployment of personnel (Carrington et al., 1997). Combined with incident logging, crime mapping, and flexible shift scheduling, CAD systems allow police agencies to prioritize urgent calls, optimize patrol routes, and reduce operational

costs. Assigning administrative duties to civilian personnel also allows sworn officers to focus on core policing responsibilities.

b) Technology-enabled policing

Modern policing increasingly relies on information technologies and crime analytics to improve operational efficiency. However, research indicates that many police agencies have not systematically integrated these technologies into decision-making or crime prevention strategies (Willis et al., 2007). Officers often evaluate technology primarily in terms of operational convenience rather than crime reduction or proactive policing, leading to resistance when systems are perceived as increasing workload (Chan et al., 2001; Garicano & Heaton, 2010; Manning, 1992a, 1992b).

When effectively implemented, digital technologies enhance criminal investigations, personnel management, transparency, communication, and resource allocation. Data analytics, psychological assessments, compliance monitoring, and Early Intervention Systems (EIS) can support evidence-based recruitment, supervision, and professional development.

c) Digital transparency and integrated case management

Integrated digital case management systems improve organizational transparency by linking personnel records, training information, operational data, and complaint management into a single platform. Such systems facilitate real-time information sharing, support legal compliance, improve organizational accountability, and enable meaningful performance evaluation. Clear organizational goals and measurable performance indicators are essential for maximizing these systems' effectiveness.

d) Surveillance technologies

Emerging surveillance-oriented security technologies (SOSTs) offer significant opportunities for crime prevention but require careful implementation. Institutional flexibility, regulatory clarity, and interoperability between systems are necessary for successful deployment. Ethical considerations and public acceptance should be incorporated throughout procurement and evaluation processes rather than treated as secondary concerns (Azoulay & Jones, 2020).

e) Benefits and limitations of technology

Information technologies, including Mobile Computer Terminals (MCTs) and CAD systems, improve reporting accuracy, communication, information retrieval, and response times (Chan, 2001, 2003; Ericson & Haggerty, 1997; Harris, 2007; Manning, 1992b; Mastrofski & Willis, 2010; Rosenbaum et al., 2011; Groff & McEwen, 2008). However, technology does not automatically improve organizational performance. Poor implementation, inadequate training, and resistance to change may reduce efficiency despite technological investment (Allen & Karanasios, 2011).

f) Digital transformation after COVID-19

The COVID-19 pandemic accelerated digital transformation across criminal justice systems worldwide. Police agencies, courts, prisons, and probation services increasingly adopted remote communication, video conferencing, and digital case management. While these developments improved service continuity, research reports mixed evidence regarding their effect on police performance (Garicano & Heaton, 2010; Brown, 2014; Willis et al., 2007).

Sustained improvements require comprehensive digital strategies, organizational commitment, and continuous evaluation rather than technology adoption alone.

5. Adopting Technology to Boost Police Efficiency

Digital technologies have become central to improving police efficiency, resource allocation, transparency, and evidence-based decision-making. One of the most important operational tools is **Computer-Aided Dispatch (CAD)**, which uses incident logging to estimate service demand, prioritize emergency responses, optimize personnel deployment, and improve operational efficiency (Carrington et al., 1997). Combined with crime mapping, GIS, and flexible shift scheduling, CAD supports better resource management while reducing administrative burdens through greater use of civilian staff.

Modern policing increasingly relies on information technologies, crime analytics, and integrated digital systems. However, many police organizations have not fully incorporated these technologies into crime prevention and decision-making (Willis et al., 2007). Research shows that officers often evaluate technology based on operational convenience rather than its contribution to proactive policing, resulting in resistance when systems increase workload or reduce discretion (Chan et al., 2001; Garicano & Heaton, 2010; Manning, 1992a, 1992b). Therefore, successful digital transformation requires organizational commitment, leadership support, and effective change management.

Technology also enhances recruitment, training, investigations, accountability, and communication. Integrated case management systems, data analytics, compliance monitoring, and Early Intervention Systems (EIS) improve transparency, support evidence-based decision-making, and strengthen professional oversight. Likewise, surveillance-oriented security technologies (SOSTs) can improve crime prevention, provided they are supported by clear regulations, interoperability, ethical safeguards, and public acceptance (Azoulay & Jones, 2020).

Although technologies such as Mobile Computer Terminals (MCTs) and CAD improve reporting accuracy, communication, and response times (Chan, 2001, 2003; Ericson & Haggerty, 1997; Harris, 2007; Manning, 1992b; Mastrofski & Willis, 2010; Rosenbaum et al., 2011; Groff & McEwen, 2008), technology alone does not guarantee better policing. Poor implementation, inadequate training, and organizational resistance may limit or even reduce operational effectiveness (Allen & Karanasios, 2011).

The COVID-19 pandemic accelerated the digital transformation of police and criminal justice systems through remote communication, digital case management, and virtual service delivery. However, evidence regarding its impact on police performance remains mixed, indicating that technology must be accompanied by supportive organizational policies and governance mechanisms to produce meaningful improvements (Garicano & Heaton, 2010; Brown, 2014; Willis et al., 2007).

Overall, modern policing depends on integrated digital platforms, cloud-based information systems, automation, and real-time data sharing to improve operational efficiency and evidence-based policing. Nevertheless, the benefits of technology can only be realized when supported by organizational reform, continuous training, effective leadership, and sound governance (Ekblom, 1999, 2005).

6. Crime Analysis Using Artificial Intelligence

Artificial intelligence (AI) is transforming crime analysis by improving crime detection, prediction, surveillance, and resource allocation. Law enforcement agencies increasingly employ crime analysis software, unmanned aerial vehicles (UAVs), body-worn cameras, and other digital tools to support evidence-based policing (Higgins, 2016; McQuade, 2001; Rogers & Scally, 2018). AI-powered surveillance-oriented security technologies (SOSTs), including CCTV, ballistic identification systems, and virtual and augmented reality for crime scene reconstruction, enhance crime detection through automated data collection, analysis, and monitoring (Pavone & Esposti, 2012; Dixon et al., 2003).

The integration of AI technologies has become particularly important as police agencies face increasing operational demands alongside budget constraints (Brown, 2020; Greig-Midlane, 2019). Within smart city initiatives, AI and information and communication technologies (ICTs) improve public safety by enabling real-time surveillance, predictive policing, and efficient resource management (Elmaghraby & Losavio, 2014; Laufs et al., 2020a).

Despite these advances, research has largely focused on the technical capabilities of AI and SOSTs, with limited attention to practitioners' experiences and operational challenges. Interviews with senior crime-reduction practitioners in London highlight the need to better understand how these technologies are used in practice, including their benefits, limitations, and implications for future policing (Liu et al., 2018, 2020). Greater attention to practitioners' perspectives can support more effective, ethical, and context-sensitive implementation of AI in law enforcement.

7. Rethinking Security and Privacy: Implications of Technological Advancements in Law Enforcement

The rapid adoption of digital technologies has transformed policing by improving operational efficiency, accountability, and service delivery while reducing costs (Adams et al., 2009; Chan, 2001; Crow & Smykla, 2019; Ekblom, 2005; Laufs et al., 2020b; Lum et al., 2017; Weisburd & Braga, 2019). However, it has also intensified the debate over balancing public security with privacy and human rights.

Public acceptance of surveillance technologies varies according to social and political contexts. Support for increased surveillance often rises following security threats or major incidents (Dinev et al., 2008; Thompson et al., 2020) and when automation is viewed as a solution to limited public resources (Joh, 2019; Leese, 2021; D. Wilson, 2019). In contrast, public trust declines after surveillance scandals and data breaches, such as the Snowden disclosures (Lischka, 2017; Murata et al., 2017). Consequently, surveillance-oriented security technologies (SOSTs) remain contested, with some advocating their expansion for national security and crime prevention, while others warn that excessive surveillance may undermine civil liberties and democratic values (Tsoukala, 2006).

Rather than viewing security and privacy as competing goals, recent research argues for a more balanced approach that recognizes the evolving nature of both concepts (Pavone & Esposti, 2012; Pavone et al., 2016). Advances in smart surveillance technologies increasingly blur the boundaries between public and private spaces, voluntary and mandatory data collection, making transparent governance, legal safeguards, and ethical oversight essential for maintaining public trust (Monahan, 2006; Tsoukala, 2006).

8. Discrepancies in Technology Adoption: Insights from Organizational Theory

Research has produced mixed findings on whether technologies such as license plate readers, surveillance cameras, and forensic systems improve crime clearance or reduce crime, despite evidence that they enhance operational productivity (Danziger & Kraemer, 1985; Ioimo & Aronson, 2003; Koper et al., 2013; La Vigne et al., 2011; Lum et al., 2011; Nunn, 1993, 1994; Roman et al., 2008; Zaworski, 2004). Organizational theory suggests that these inconsistencies arise because technological outcomes depend not only on the technology itself but also on how it is understood and used within organizations.

According to Orlikowski and Gash (1994), **technological frames** consist of the assumptions, expectations, and knowledge that shape how organizational members perceive and use technology (see also Orlikowski, 2000; Weick, 1995). These frames are influenced by organizational culture, prior experience, and professional roles, which ultimately affect technology adoption and outcomes (Boudreau & Robey, 2005; Orlikowski, 1992; Robey et al., 2000). Consequently, managers may view new technologies as tools for improving efficiency and accountability, whereas frontline officers may perceive them as threats to professional discretion or increased workload (Rocheleau, 1993; Chan et al., 2001; Harris, 2007; Manning, 1992a).

Manning (2008) further argues that the traditionally reactive, incident-driven culture of policing reinforces conventional practices and shapes how technology is interpreted and applied. This "standard model" of policing may filter or constrain technological innovation, limiting its impact unless accompanied by organizational and cultural change (Kelling & Moore, 1988; Weisburd & Eck, 2004; Harris, 2007; Sanders & Henderson, 2013; Sanders et al., 2015). Similarly, the **task-technology fit** perspective suggests that technology improves performance only when it aligns with users' tasks and organizational needs (Goodhue, 1988, 1995; Ioimo & Aronson, 2004).

9. Navigating Technological Integration in Law Enforcement: Challenges and Opportunities

The integration of digital technologies into policing offers significant opportunities to improve efficiency, accountability, and decision-making, but its success depends on organizational readiness and effective implementation. Safeguarding personal information and data integrity is essential as law enforcement agencies increasingly rely on digital systems (Braun et al., 2018; Sen et al., 2013; van Heek et al., 2017).

Technology adoption often encounters organizational resistance because it can alter established work practices and police culture (Rogers & Scally, 2018; Hassell, 2006; Nhan, 2014). Simply adding new technologies to existing systems without redesigning organizational processes limits their effectiveness and may reinforce outdated practices (Chan, 2001; Rogers & Scally, 2018). Fragmented policing structures, poor interoperability, and the absence of standardized information-sharing protocols further hinder successful implementation (Allen et al., 2008; Elliott-Davies et al., 2016; Grace, 2019; Newell, 2013). Inadequate training, limited institutional support, and financial and legislative constraints also reduce the effectiveness of technological innovations (White & Escobar, 2008; Taylor et al., 2014; Rogers & Scally, 2018; Kirmeyer & Dougherty, 1988).

Research further suggests that technology adoption should be guided by users' operational needs and organizational contexts rather than technology alone (Brell et al., 2018; Werlinger et al., 2009; Botta et al., 2007; Werlinger et al., 2008). Over the past four decades, technologies such as automatic number plate recognition, electronic ticketing, computerized records management, and modern communication systems have significantly improved

policing by increasing efficiency and reducing administrative burdens (Rutgers & van der Meer, 2010; McGowan, 1984a; Hatry, 2014). However, these benefits can only be realized when technological innovation is supported by organizational reform, comprehensive training, and effective change management (Chan, 2001; Hirschmann & Christe-Zeyse, 2016; Ingram et al., 2018).

10. Conclusion

Effective policing is fundamental to maintaining public safety and the rule of law. However, Pakistan's police continue to face persistent challenges, including political interference, inadequate recruitment and training, limited resources, weak accountability, poor coordination, outdated organizational structures, and insufficient technological capacity. These constraints reduce operational efficiency, undermine public trust, and weaken the country's ability to address crime and terrorism effectively.

Despite these challenges, the performance of specialized police units, the **Crime Control Department (CCD)**, the **National Highways and Motorway Police**, and Pakistani officers serving in **United Nations** peacekeeping missions demonstrates that meaningful reform is achievable. Strengthening police capacity requires merit-based recruitment, evidence-based manpower planning, continuous professional training, organizational reforms, and greater coordination among law enforcement and intelligence agencies.

Digital technologies, including AI, crime analytics, surveillance systems, integrated databases, and cloud-based information management, can significantly improve police efficiency, transparency, and decision-making. However, technology alone cannot transform policing. Its success depends on supportive policies, adequate funding, organizational change, ethical governance, and public trust.

Overall, Pakistan should prioritize the optimal utilization of its existing police workforce through data-driven deployment, modern technology, effective accountability mechanisms, and community-oriented policing. These reforms would strengthen law enforcement capacity, improve counterterrorism efforts, enhance public confidence, and contribute to a more professional, efficient, and responsive policing system.

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