

Polizei, BOS
& Sicherheit –
Schnittstellen der Praxis

Raphael Röttinger

Security Management of Public Sports Events

A Case Study on Football Stadiums
in Germany



Nomos

Polizei, BOS & Sicherheit – Schnittstellen der Praxis

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Volume 1

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This dissertation was published by Nomos Verlag. Both the manuscript and the proper awarding of the doctoral degree were verified and confirmed prior to publication by the publisher and by the responsible doctoral committee of the university. Corresponding evidence was provided.

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at <http://dnb.d-nb.de>

ISBN 978-3-7560-1996-0 (Print)

978-3-7489-5534-4 (ePDF)



Onlineversion
Nomos eLibrary

1st Edition 2025

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III List of Abbreviations

AI	Artificial Intelligence
AKG	Working Group on Major Events
AR	Augmented Reality
BBK	Bundesamt für Bevölkerungsschutz und Katastrophenhilfe/Federal Office of Civil Protection and Disaster Assistance
BewachV	Verordnung über das Bewachungsgewerbe/Ordinance on the Security Industry
BMI	Bundesministerium des Innern und für Heimat/Federal Ministry of the Interior and Community
BUW	University of Wuppertal
BZRG	Bundeszentralregistergesetz/Act on the Central Criminal Register and the Educative Measures Register
CBRNE	Chemical, Biological, Radiological, Nuclear, Explosive
CCC	Chaos Computer Club
CCTV	Closed Circuit Television
CPTED	Crime Prevention Through Environmental Design
CTE	Counter Terrorism Exercises
DFB	Deutscher Fußball-Bund/German Football Association
DHPol	Deutsche Hochschule der Polizei/German Police University
DRK	Deutsches Rotes Kreuz/German Red Cross
DSB	Deutscher Sport Bund/German Sports Federation
EURO	European Football Championship
ESG	Environmental, Social, and Governance
EZB	European Central Bank
FA	Football Association
FIFA	Fédération Internationale de Football Association
FORSI	Forschungsinstitut für Unternehmenssicherheit und Sicherheitswirtschaft/Research Institute for Corporate Security and the Security Industry
GewO	Gewerbeordnung/Trade Regulations

III List of Abbreviations

GG	Grundgesetz/Constitution
GST	Gesellschaft für Sport und Technik/Society for Sport and Technology
HECMC	Health Emergency Crisis Management
HRM	Human Resource Management
IBIT	Internationales Bildungs- und Trainingszentrum für Veranstaltungssicherheit/ International Education and Training Center for Event Safety
ICC	Inter-ministerial Crisis Center
IEDs	Improvised Explosive Devices
IMK	Innenministerkonferenz/Conference of Interior Ministers
IPCC	International Police Center
MVStättVO	Musterversammlungsstättenverordnung/Model Meeting Place Regulations
NKSS	Nationales Konzept Sport und Sicherheit/National Concept of Sport and Safety
PPPs	Police-Private Partnerships
ProVOD	Professionalisierung des Veranstaltungsordnungsdienstes/Professionalization of Event Security Services
PSS	Private Security Services
QuaSOD	Qualifizierung Sicherheits- und Ordnungsdienste/Qualification for Security and Order Services
SDL	Sicherheitsdienstleister/Security Service Provider
StGB	Strafgesetzbuch/Criminal Code
SKB	Szenekundige Beamte/Spotter
SLR	Systematische Literaturrecherche/Systematic Literature Research
SOD	Sicherheits- und Ordnungsdienste/Security and Order Services
StPO	Strafprozessordnung/Code of Criminal Procedure
SYF	Students and Young Professionals
THW	Technisches Hilfswerk/Technical Relief
UEFA	Union of European Football Associations
VDI	Verein Deutscher Ingenieure/Association of German Engineers
VR	Virtual Reality
ZIS	Zentrale Informationsstelle Sporteinsätze/Central Information Office for Sports Operations

Introduction

The governance of stadium security represents a critical challenge for public administration in Germany, where state authorities must balance their fundamental responsibility for public safety with the operational involvement of private security services. This evolution in security provision is a result of broader changes in how public institutions exercise their authority and oversight responsibilities. In German professional football, public authorities have developed a wide range of regulatory and oversight mechanisms over three decades, creating an institutional framework that further adapts and evolves in response to emerging challenges while upholding the state's ultimate responsibility for public safety.

The transformation manifests most prominently in how state authorities coordinate and oversee multiple security stakeholders, from private security firms to venue operators and sports associations. This migration from direct provision to regulatory oversight has created novel challenges for public institutions, particularly in the establishment of consistent standards and effective coordination across different jurisdictions. EURO 2024 brought inadequacies regarding these challenges into sharp focus, thus revealing limitations rather than strengths of current governance approaches.

While the tournament demonstrated some significant advances in public sector oversight mechanisms, it also exposed persistent institutional weaknesses: inconsistent regulatory interpretation across jurisdictions, varying quality standards for private providers, and challenges in coordinating responses to emerging threats. These issues transcend specific operational hurdles, pointing instead to fundamental questions about how public authorities can most effectively exercise their governance responsibilities in an increasingly complex as well as unpredictable security environment.

In this context, the following chapters serve as an introduction to the most important aspects of this work examining private-public interactions in the German security sector, with a focus on stadiums and the EURO 2024 football competition as an example. The main purpose is to lay out the motivation behind the present research and to explain which areas and problems it addresses and why they are of concern for officials in charge of preserving public safety.

Background

As stated above, stadium security governance presents a difficult hurdle, where tension lies in the German public administration's responsibility to balance public safety responsibilities with the operational roles of private security services. This dual responsibility arises because public authorities remain ultimately accountable for public safety while increasingly relying on private security providers for operational execution. This shift is a result of broader trends in public sector governance, where state institutions seek to optimize resources and expertise by delegating certain functions to private entities. However, this delegation necessitates robust oversight mechanisms to ensure accountability, coordination, and ultimately compliance. The upcoming UEFA European Football Championship (EURO 2024) in Germany exemplifies the complex character of these governance arrangements, thereby providing a timely opportunity to evaluate existing frameworks and their effectiveness in managing public-private interactions in stadium security.

The National Security and Sport Concept (Nationales Konzept Sport und Sicherheit, NKSS) serves as a framework to orient governance of stadium security in Germany. Since its inception in 1992, the NKSS has stressed the relevance of high-quality security services in sports (NKSS, 1992, p. 30). It provides regulatory guidance for integrating public and private security services through presenting information on areas such as training, communication, and compliance. Despite significant advancements, the NKSS requires constant updates to address novel, emerging challenges. To meet the demands of those challenges, recent research by Kubera et al. (2019, p. 274) concluded that commercial security services must be assigned central importance in football associations and clubs, particularly due to "site-specific training and continuing education measures." Although this implies significant operational contributions of private security, additional questions arise about the adequacy of their integration into larger public safety frameworks.

Such a public safety framework is situated at a critical intersection of public authority and private involvement, where the state's monopoly of violence ("Gewaltmonopol des Staates") encounters both conceptual as well as practical challenges. This foundational principle of democratic governance asserts that the state alone has the legitimate authority to use force to maintain public order. The increasing recruitment of private security services introduces dynamics, particularly regarding the delineation of au-

thority, accountability, and the ethical implications of delegation that could contradict this principle.

In the context of stadium security, this tension is amplified. Public authorities, tasked with safeguarding public safety, often delegate operational responsibilities to private security providers. This delegation is driven by efficiency and resource optimization but risks diluting the clear boundaries of state authority. Theoretical frameworks on governance emphasize the need for robust regulatory structures to manage these blurred lines, by ultimately ensuring that private actors operate under the direct oversight of public institutions. Yet, in practice, gaps in coordination and ambiguity in roles often lead to challenges in maintaining the state's final accountability.

The described delegation of security responsibilities also raises some legal and ethical questions. For instance, private security personnel may be tasked with performing functions that approach the use of force, such as crowd control, conflict de-escalation, or enforcement of venue rules. While these tasks are operationally unavoidable, they must be carefully aligned with legal standards that uphold public trust in the governance of security. Standards such as the NKSS fall short of completely solving the problem of such alignment.

The interplay between public authorities, such as the state and police forces, and private security services is further complicated by their differing mandates and capacities. Public entities operate under a legislated mandate to enforce the aforementioned state's monopoly on force, whereas private security providers deliver specialized services under contractual agreements. This division of roles creates potential gaps in coordination, accountability, and information sharing—issues that become particularly acute during large-scale events like the World Cup or European Championship. Research by Ludvigsen and Bond (2022), Toohey & Taylor (2014), and Wong and Chadwick (2017) illustrates how operational procedures such as crowd dynamics, risk assessments, and communication breakdowns can fail as a direct consequence of mismanaged coordination efforts in public-private interactions.

One significant initiative aimed at addressing these coordination challenges is the SiKomFan project, which stands for “More Safety in Soccer – Improving Communication Structures and Optimizing Fan Dialogue” (Mehr Sicherheit im Fußball – Verbessern der Kommunikationsstrukturen und Optimierung des Fandialogs). This project builds on the principles of the NKSS and has been instrumental in identifying communication gaps and proposing measures to improve stakeholder collaboration. While the

project resulted in some clarification regarding public sector perspectives, it has largely overlooked the role of private security services in shaping the security landscape. This research gap provides one of the key motivations for this study, which aims to examine the contributions and limitations of commercial security providers within the broader governance framework.

The European Football Championship in Germany in 2024 presents a unique and simultaneously pressing case study for these issues. It involves a complex array of risks, including potential climate protests, hooliganism, and terrorist threats, compounded by geopolitical instability arising from the Russia-Ukraine conflict. The accessibility of advanced drone technologies and the lingering possibility of a resurging COVID-19 pandemic add further dimensions to the security challenges. Addressing these entropic risks requires precise coordination between public authorities and private security providers, whereby the margin for error or latency is relatively small. Yet, existing literature reveals significant gaps in understanding how these interactions can be optimized to address emerging threats effectively and imminently. The contributions of the Research Institute for Corporate Security and the Security Industry (Forschungsinstitut für Unternehmenssicherheit und Sicherheitswirtschaft, FORSI) published after 2019 validates the existence of such gaps and the need for updated strategies that until to date lack a focused examination of public-private integration. Due to these knowledge gaps, this dissertation is committed to a thorough examination of such public-private integration.

Research Objectives

As stated above, this dissertation is dedicated to the investigation of public-private interaction dynamics in stadium security governance, with a particular emphasis on the institutional and strategic dimensions in Germany rather than operational details. It primarily aims to investigate how public authorities and private security providers collaborate to address complex and unpredictable security challenges, particularly in the context of large-scale events such as EURO 2024. In that commitment, the research is motivated by a need to understand and improve the frameworks that enable accountability, coordination, and risk management, while navigating ethical, legal, and coordinative problems that arise due to the state's monopoly on violence.

The central thesis of this research is that effective stadium security governance relies on robust institutional frameworks that facilitate strategic

alignment, transparent accountability, and adaptive coordination between public authorities and private security providers. This reliance stems from three key factors: first, the inherent complexity of multi-stakeholder security operations requires formalized structures to prevent coordination failures and accountability gaps; second, the overlapping jurisdictions of public and private security entities demand clear delineation of responsibilities to avoid both duplication of efforts and critical oversight gaps; and third, the scale of mass gatherings in stadiums creates unique vulnerabilities that can only be effectively managed through integrated security approaches. Such frameworks must also be capable of addressing emerging security threats, such as technological advancements, geopolitical tensions, and social unrest, which increasingly test the resilience of traditional governance models. This adaptability requirement is driven by the accelerating pace of threat evolution, as demonstrated by recent incidents where conventional security measures proved inadequate against novel challenges like coordinated cyber-physical attacks and digital, socio-political engineering schemes. Therefore, the central thesis implies that domain-general frameworks are needed due to a rapidly changing security landscape, and the extent to which those frameworks are domain-general will be proportionate to their effectiveness. This leads to the inference that security frameworks limited to specific threat types or operational contexts will consistently fail to address complex, multi-vector security challenges that characterize modern stadium environments. Based on the central thesis, a focal research question to guide the overall structure of this dissertation is formulated as follows: “How can governance frameworks enhance the collaboration between public authorities and private security providers to effectively address emerging security challenges in stadium security management, particularly during large-scale events like EURO 2024?” In this question, the key elements of this thesis are synthesized: framework effectiveness, public-private collaboration, and adaptive capacity.

Subsequently, the object of this research is the institutional and governance mechanisms that shape public-private collaboration in stadium security. This focus emerges directly from the present thesis’s emphasis on robust institutional frameworks, as these mechanisms constitute the formal structures through which strategic alignment and adaptive coordination materialize. Specifically, this encompasses the policies, legal frameworks, and oversight structures that dictate how responsibilities and resources are distributed among stakeholders during high-profile events—elements that directly enable or constrain the framework capabilities identified in the

central argument of this thesis. Building on this foundation, this research examines the changing relationship between public authorities, such as police and municipal governments, and private security actors tasked with operational responsibilities. This relationship represents the active manifestation of the institutional mechanisms identified as the research object of this thesis, viewed through the lens of strategic governance. This approach allows to analyse how the theoretical frameworks translate into practical collaboration, specifically examining how such collaboration is formalized, executed, and evaluated in practice. Based on the research object and subject definitions, this dissertation proposes the following hypotheses, each derived from specific aspects of the central thesis:

1. Governance frameworks that prioritize strategic alignment and adaptive coordination between public authorities and private security providers lead to more effective stadium security management. This hypothesis directly tests the fundamental assumption of this thesis regarding the relationship between robust frameworks and security effectiveness.
2. Emerging security threats, such as advancements in technology and geopolitical tensions, disproportionately impact the effectiveness of public-private interactions in traditional governance structures. Evidently, this hypothesis follows from this thesis's assertion about the critical role of adaptability in modern security frameworks.
3. Enhanced regulatory oversight and compliance mechanisms significantly improve the accountability and integration of private security providers within public safety frameworks. This postulate relates to the transparency and accountability components identified in the central thesis.
4. Lessons learned from previous large-scale events can serve as a foundation for deriving knowledge on future-proof governance strategies that optimize public-private collaboration in stadium security in the face of novel security threats. This will reveal whether the domain-general nature of such lessons and frameworks relates to their evaluated effectiveness, as proposed in the central thesis.

Building on this progression, the study is guided by the following core research questions:

- What are the strengths and limitations of existing governance frameworks in facilitating collaboration between public authorities and private security providers? This question operationalizes the first hypothesis of this thesis.

- In what ways do emerging security threats, such as advancements in drone technology and cyber risks, influence the roles and integration of private security providers within public safety frameworks? While striving to avoid operational details whenever possible, the question relates to the adaptive capacity requirements identified in this thesis and the second hypothesis.
- How can regulatory oversight and compliance mechanisms be enhanced to ensure effective public-private coordination in stadium security? This question derives from the third hypothesis of this thesis and directly addresses the accountability component of the central thesis.
- How can the findings from previous large-scale events inform the development of innovative governance strategies for future stadium security? This question connects the fourth hypothesis to practical framework development and tests this thesis's claim about domain-general applications.

To systematically investigate these questions and address the research object and subject, this dissertation undertakes the following sequentially structured tasks:

- Conduct an extensive review of existing literature to identify theoretical and empirical gaps in the study of public-private interactions in stadium security. Such a review serves the purpose of establishing the theoretical context for the framework-focused analysis.
- Analyse key regulatory documents, including the NKSS, to evaluate their influence on the operational and strategic alignment of public and private security stakeholders, while focusing on high-level information rather than operational detail. Those regulatory documents relate to existing institutional frameworks as referenced in the research object definition.
- Perform qualitative interviews with diverse stakeholders to gather knowledge regarding practical challenges as well as opportunities, thereby investigating the public-private relationships outlined in this thesis' research subject.
- Select and analyse case studies of past large-scale events to extract lessons learned and identify best practices in managing public-private interactions. A specific focus will be on EURO 2024 and other stadium security contexts preferably in Germany, relating to several research objectives at once.
- Formulate actionable recommendations for policymakers and security managers to optimize governance frameworks, emphasizing institutional

reforms, capacity building, and strategic integration of private security providers.

Before these tasks are performed, the following chapter will outline the broader relevance of this thesis and the associated target audience.

Relevance and Target Audience

This dissertation is intended to make contributions to both the theoretical understanding and framework-level design of governance mechanisms for public-private security interactions that aim to enforce stadium security in Germany. Notably, it attends to one of the critical gaps in the security governance literature by assessing how institutional frameworks adapt to emerging threats without failing to harmonize public oversight with the integration of private security actors, which contribute efficiency to the securitization process. These challenges to governance are increasingly intractable and interrelated; therefore the research agenda of this dissertation lays considerable emphasis on framework adaptability and domain-general principles.

Comprehensive stakeholder interviews, involving both public authorities and private security management are used in this dissertation to deepen the understanding of optimal public-private security interaction frameworks from the perspective of both parties. These interviews, combined with a systematic literature review and case study analysis, will show both institutional challenges and potential pathways to the improvement of those governance structures.

This research is particularly pertinent to public policy officials and administrators who must face an increasingly complex landscape in modern security governance. For stakeholders, evidence-based insights into the optimization of public-private security interaction frameworks are provided; the derived designs are especially needed today, due to the ever-changing nature of security threats. Analysis of the governance arrangements for EURO 2024 will draw out lessons concerning the building of adaptive regulatory structures which secure accountability through effective collaboration between public and private actors.

As a result, this work significantly extends the scholarly discourse initiated by Kubera et al. (2019) within the academic community by incorporating emergent governance challenges and contemporary institutional frameworks. While most previous studies have focused on operational as-

pects, this study's examination of governance mechanisms and strategic relationships fills a crucial theoretical gap in understanding public-private security collaboration from a high-level perspective.

Research Outline

The first chapter delineates the theoretical framework for the study and describes areas of application in security management. It analyses strategies, models, and methods in favour of cooperation between private and public security actors and mentions the role of the state monopoly on force. Furthermore, this chapter elaborates on different security risks and their impacts on society and covers the current threat landscape in Germany. It deals with large-scale emergencies, attack scenarios, and the so-called chaos phase as a critical moment in security management. A particular focus is placed on the security challenges associated with EURO 2024, including planned measures, potential incidents, and the responses of organisations and authorities.

The second chapter shifts the focus to the application of security management, particularly in the context of football stadiums in Germany. A core theme of this chapter is the analysis of the NKSS, a uniquely German framework guiding security measures at sports events. These range from preventive and repressive measures, their legal context, infringements of fundamental rights within stadiums, the tasks of the security personnel, to a development of safety standards in the last three decades that also involves reforms. In this chapter, the analysis is deepened by an empirical investigation based on four methodical approaches: a systematic literature review, qualitative expert interviews, a quantitative survey, and case studies. Each method is detailed, including questionnaire design, sampling and results, presenting knowledge regarding specific challenges and best practices in public-private security management.

The last chapter synthesises the findings from the previous chapters and offers a cross-methodological discussion of the results. Based on this analysis, best practices and recommendations for action are developed; these give practical guidelines for improving security at sporting events. This chapter also introduces more "holistic" security concepts. It concludes with a critical reflection on the research methods, considering strengths and limitations. The dissertation ends with a final summary of key findings and concluding remarks.

1 Conceptual Dimensions of Security Management

In this conceptual section, the corresponding regulations, terminology and measures are discussed. This section forms the basis for the subsequent systematic literature review and for the qualitative and quantitative interviews, relevant for developing the questions and ensuring the traceability of the results. For this purpose, the section is divided into several core areas. The study delves into areas of application, strategies and methods of security management, laying the groundwork for understanding the collaboration between public and private security actors, alongside the role of the state monopoly on force. It also examines various security risks and their implications for society, with a specific focus on the challenges of ensuring safety during major events like EURO 2024.

1.1 Security Management – Areas of Application

While the terms “security” and “safety” usually do not require an explanation, they should be briefly defined in the context of security management. Particularly noteworthy is the reference to the future, which not only describes the danger-free state in the present but also an expectation regarding the maintenance of this state over a long period of time. For optimal security, it must be possible to succinctly assess the development of a situation with regard to the future security status. In order to achieve this, various aspects and strategies must be taken into account (Henne et al., 2017, pp. 9–10, see also Li & Guldenmund, 2018; Vellani, 2007), which are presented below.

To describe the different areas of security management, they can be divided into the public and private fields of use or action and the assigned tasks of the responsible personnel (Sotlar & Meško, 2009, pp. 270–271). Historically, the private security developed before public security. In general, security always reflects society and aims to meet the needs of this society. If the latter changes, security changes as well. This includes changes to the ratios of public and private security in use. Some security areas, however, are not expected to change—for example, it is unlikely that nations would fully change to private security services.

In the last decades, the relationship between public and private security grew continuously, and there is a broader overlap between the two, driven in part by the outsourcing of public security functions to private firms (Pacciardi & Berndtsson, 2022, pp. 4012). Consequently, it is more common nowadays for police officers to change to a career in the private security sector. Both public security and other areas can gain benefits from the increasingly strong relationship between public and private security. This also results in a higher number of contractual partnerships, in which private security providers complement public security functions, making them more effective. The main differences between public security and private security are their respective philosophies, principles, authorities and status. While public security is obligated to provide an egalitarian service, private security is obligated to perform any measures that serve exclusively to protect their client. In other words, public security upholds the social contract of society, while private security protects a person's assets (Smith & Brooks, 2013a, pp. 1–22).

In terms of the prevention of crimes in public places through private agents, security guards are often employed, for example, to secure spaces such as car parks. Security management can be implemented indirectly as a secondary part of employment, for example, in relation to bus drivers who need to perform surveillance measures as part of their job. These so-called place managers are also used to prevent crimes from being committed in public places, however, their effectiveness is not well researched. Another approach to security management, which does not include personnel, is the use of measures such as street closures or barricades. This involves changes to the existing environment, which makes spaces more secure and less accessible to potential offenders. There is strong evidence that these techniques are effective in crime prevention (Welsh et al., 2010, pp. 299–319).

One of the most important areas for this thesis is event security management. These events are almost exclusively public. As O'Toole (2020) states, crowds exist almost everywhere; they exist at the beach, while waiting for the train, at lunch or concerts, at protests or when a new phone is launched. Crowds are related to proximity, queues or lines, as well as delay and frustration. They may also be linked to positive attributes such as celebration, socialisation and fun. An escalation in a crowd can have dangerous consequences, since individuals can lose the freedom of choice and movement, risk their health or be targeted for theft or hostile behaviour. Security management of events includes all events where a crowd gathers under

guidance, for a specific purpose or based on common interests (O'Toole, 2019, pp. VI-XII, see also Risch-Kerst, 2018). Security management at sports events does not only influence players, fans and other agents directly. It also has indirect influence on aspects of the freedom of visitors and citizens through access control, surveillance and monitoring of behaviour (Menaker et al., 2021, pp. 1–3; see also Hall et al., 2011; Paré, 2024).

Another public area of security management is hospitality and tourism (Agarwal et al., 2021). These sectors are also connected to sports and thus particularly relevant to our research objectives, not least because they demonstrate similar challenges in public-private security governance frameworks, especially at international events (Toohey & Taylor, 2008, p. 451). A notable finding is the gap between how hotel managers and guests respectively perceive the importance of various safety and security features (Chan & Lam, 2013). One of the primary concerns for guests includes well-equipped fire-prevention systems that comply with local regulations, emergency plans, and reliable emergency lighting systems. Additionally, guests value the presence of uniformed security personnel and regular testing of the hotel's safety and security systems. In contrast, hotel managers tend to prioritize surveillance and access-control measures more heavily. This includes the implementation of closed-circuit television (CCTV) systems in public areas and the use of guest key cards to activate lifts to guest floors. Such measures demonstrate a managerial focus on monitoring and controlling the environment to maintain safety and security on the hotel premises. Chan & Lam (2013) also identify the importance of training staff in safety and security measures. Proper training ensures that all hotel staff are prepared to act effectively and efficiently in emergency situations, including the use of high-tech security systems (Chan & Lam, 2013, pp. 202–216). Such discrepancies between hotel managers as high-level entities and small actors like guests mirrors the institutional challenges faced in stadium security governance, where different stakeholders may have varying priorities and perceptions of security needs. Due to the unpredictability of a parties' specific operational demands, systems must be created that are themselves above those operational demands and that guide negotiations between the parties before procedural details are explicated.

With regard to the tasks of security management, managing risks is an important factor. Especially regarding the recent acceleration of the pace of change, risk management must be thoroughly developed. In recent years, this development changed the traditional views of risk management from “guns, guards and gates” through “ciphers, safety and society” to a concept

of “providing resilience” (Mishra et al., 2020). This indicates a change in values from physiological needs and safety, which are increasingly met, to needs of belonging, esteem and self-actualization. Society today expects basic needs to be met and focuses more on higher requirements. This is also important for the evolution of technology and methods to counteract more complex risks and threats, like bioterrorism, global warming, as well as demands to sustain and improve the existence of society as a whole. When it comes to the protection of assets, this means that the traditional concepts of asset protection give way to the protection of the functions and capabilities these assets provide (Talbot & Jakeman, 2011, pp. 4–16, see also Schreyer, 2024).

Another important task in security, and one of the key factors for its initial development, is the direct protection of people and assets, commonly referred to as “physical security” (Muhammad et al., 2017, p. 101). Even though a large part of organisational operations today occurs in the virtual world, physical targets remain crucial and worth protecting. For example, data centres and people in general are susceptible to physical attacks (Aslan et al., 2023, p. 32).

In general, security structures and areas often focus on public safety and order, which has increased in importance over the last decades. The terrorist attacks of September 11, 2001, represent a pivotal moment in global security policy and in the management of security measures, particularly in relation to counter-terrorism efforts (Farag, 2020, p. 323; Toohey & Taylor, 2008, p. 451). These events led to a reassessment of the threat posed by international terrorism and resulted in the implementation of security strategies at both national and international levels. In the immediate aftermath of 9/11, security measures were intensified worldwide to prevent similar acts of terror. This included the introduction of stricter aviation-security procedures, increased surveillance and data collection, and the development of measures to combat the financing of terrorism (Levi & Wall, 2004, pp. 194). Since then, security management in the context of counterterrorism has adopted a multidisciplinary approach, involving the coordination of various security agencies, the use of advanced technologies, and the development of strategies for risk assessment and mitigation.

Nowadays, preventative security is emphasized and aims at identifying and neutralizing terrorist threats before they become active (Syahputra & Hamid, 2024, p. 357). This approach is based on the premise that preventing attacks is more effective than responding to them. It involves the analysis of intelligence information, monitoring of suspicious activities, and

the implementation of measures to counter potential threats (Phelps, 2020, pp. 599–604; Khan et al., 2023, pp. 135864–135879; Nie & Sun, 2016, pp. 1–5). Therefore, preventive security becomes an important part of modern security management.

Another significant development in modern security management is the enhanced communication and collaboration between security agencies, law enforcement, and other relevant agents (Hubanova et al., 2021, p. 77). This development is caused by the complex nature of terrorism threats, which necessitates a broad approach. Despite the critical need for such a holistic and long-term approach to counter terrorism, the private sector's engagement in this area has historically been peripheral, primarily due to the low occurrence but high impact of terrorist attacks. This new approach led to the establishment of formal networks between public and private security sectors to improve counter-terrorism efforts; and it is recognized as crucial for developing comprehensive security strategies (Whelan & Dupont, 2017, p. 97). Despite the apparent need for such a collaboration, the private sector faces significant challenges in forming partnerships with public institutions due to the absence of a standardized approach to terrorism security and a shared understanding of how private security contributions can enhance prevention efforts. Current strategies aim to manipulate environmental variables to reduce the chances of terrorist acts by broadening the scope of response to include both public and private sector contributions (Phelps, 2020, 599–604).

Based on the lack of a standardized approach to terrorism security, the incorporation of digital platforms and artificial intelligence (AI) represent another current development (Macdonald et al., 2024, pp. 3–6). Digital platforms and secure communication channels allow for real-time sharing of intelligence, enabling a more dynamic and responsive approach to counter-terrorism operations. While much attention is paid to AI's operational capabilities in threat detection, these platforms also serve a crucial institutional function: they create standardized interfaces for public-private coordination that transcend individual operational decisions. This digital backbone supports the integration of various data sources, including public surveillance systems, online monitoring tools, and databases of known threats, enhancing the ability of agencies to predict and prevent potential terrorist activities. Advanced technologies such as artificial intelligence, machine learning, and big-data analytics have become invaluable tools in the fight against terrorism. These technologies allow for the processing of vast amounts of data to identify patterns, trends, and potential threats