REVIEW PAPERS

Command and control information systems for military applications

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Abstract:

Introduction/purpose: A command and control information system (C2IS) is a technical system designed to provide decision makers with the information they need to plan, coordinate, and manage operations. It consists of hardware and software, and includes a specialized set of tools and processes that aim to ensure the timely and accurate flow of information. C2IS can be intended for military applications, public safety, and corporate management. The paper presents the historical development of military C2IS. Examples of modern C2IS of some technologically advanced countries are given, such as the USA (NATO), the Russian Federation, the People's Republic of China, India, the United Kingdom, France and Israel.

Methods: This article is a review of 60+ references relating to the historical development of military C2IS, as well as modern C2IS of some technologically advanced countries.

Results: Based on cited references, this article summarizes the historical development of C2IS for military applications, and presents a brief overview of the modern C2IS of seven technologically advanced countries.

Conclusion: Command and control information systems are widely used in modern militaries. Their development began in the mid-20th century. Over the past 80 years, C2IS have evolved from the manually operated systems of the 1940s to the modern systems that are driven by artificial intelligence (AI) today. The era of modern C2IS began in the 1990s. Since then, the focus has been on decentralization and autonomous decision making, efficient data management, and cybersecurity. In recent years, the central focus has been on the integration of AI into C2IS.

Key words: defense technologies, command and control information systems, informatics, telecommunications

Introduction

Command and control theory separates the art of *command and control* (C2) from technical systems that support C2. A technical system, which consists of hardware and software and supports C2 by providing decission makers (commanders) with the necessary information to make decisions, is called a *command and control information system* (C2IS).

For years it was thought that the qualities of commanders and their ideas are more important to a general theory of command and control than are qualities of their technical hardware and software systems. In an age of almost unlimited technical capabilities, commanders are increasingly faced with the problem of too much information, not too little. In this regard, technical systems that perform acquiring, filtering, correlating, and fusing information have become extremely important. Understanding which information is the most important for decision making is now a major issue in the design of C2 information system (Builder et al, 1999).

Rather than thinking of C2 as a static set of defined activities that take place, the modern concept views C2 as a socio-technical capability that must continuously evolve to respond to the scale and complexity of the challenges likely to be faced in the future operating environment (Ellis et al, 2024).

C2IS consists of hardware and software, and involves a specialized set of tools and processes designed to provide accurate and secure information to decision makers for planning, coordinating, and managing operations. The applications of C2IS can be very diverse. They include, but are not limited to:

- Military applications,
- Public safety and security, and
- Corporate management.

In this article, the focus will be on the use of C2IS in military applications. In that sense, C2IS can be defined as a military system designed for retrieval, storage, exchange, processing and visualization of tactical data in order to provide effective decision-making support to commanders.

There is no straightforward definition of C2, reflecting debates about the term's scope and relevance in the contemporary operating environment. At the most basic level, C2 can be broken down into its two constituent elements (Black et al, 2024):

- Command: the authority given to an individual in the armed forces for the direction, coordination and control of military forces, and
- Control: the authority held by a commander over part of the activities of subordinate or other organisations, not otherwise under his/her command, which includes responsibility for implementing orders or directives.

The usage of new C2-related buzzwords reflects the fact that 'words move money', and that new terminology can help provide new funding for defence projects (Black et al, 2024).

Since control requires the ability to communicate, and usually depends on computers, in technical literature the acronyms C3 (*command, control and communications*) or C4 (*command, control, communications and computers*) are also encountered.

Furthermore, since the role of the C2 information system is to provide decision support, in technical literature the term *command information and decision support system* (CIDSS) is also used.

Finally, the examples of jargon include, but are certainly not limited to: C3I (*command, control, communications and intelligence*), C4ISR (command, control, communications, computers, intelligence, surveillance and reconnaissance), C4ISTAR (which adds target acquisition), C5ISR (which adds cyber), and even C6ISR (which also includes combat systems).

Although different terms are used for essentially the same concept, the authors of this paper have chosen to use the term *command and control information system* and the corresponding acronym C2 *information system*, i.e. C2IS, in the rest of this article.

Since C2IS is a highly sensitive military system, in most cases the exact technical details are not publicly available. However, some sources provide credible data based on military doctrine and expert analysis.

There is no C2IS that integrates all types, branches and services of military forces. As a rule, the existing systems are designed for one type: the Army, the Navy or the Air Force, or for some specific branches or services. A special problem is defining the requirements that C2IS needs to fulfill. In technical literature, one can find a statement that „we have the situation where defining Army C2IS requirements is perhaps more difficult than building the systems to meet those requirements" (Kroening, 1986). So, one can say that a military C2IS is composed of multiple interconnected subsystems focused on a specific type, branch or service.

The term C2IS is often equated with the term *integrated combat system* (ICS), but there is a significant difference between the two. The aim of C2IS is to process battlefield data to help commanders make strategic and tactical decisions, as well as coordination in military operations. On the other hand, the aim of ICS is to execute combat missions by integrating sensors, C2, and weapons. In other words, an ICS often incorporates C2IS functions, but extends beyond to include actual combat execution.

In the text which follows, the history of military C2IS development and some modern military C2IS will be considered.

History of military C2IS development

The development of command and control information systems (C2IS) for military applications began in the mid-20th century, evolving from early command and control (C2) concepts used in World War II.

The British integrated air defence system in World War II, known as the Dowding System after the Air Chief Marshal Hugh Dowding (1882-1970), is considered to be the first C2IS. This system included code-breakers, radar stations, observers, searchlights, barrage balloons, anti-aircraft guns, and fighter planes. Working together through a combined operations centre, these various elements ensured that the German Air Force could be better tracked and intercepted (Cartwright, 2024). The Dowding System is considered to be a C2IS, although it has elements of an ICS because it contains aircraft guns.

The Semi-Automatic Ground Environment (SAGE) system was the first USA air defense C2IS developed by the Lincoln Laboratory of the Massachusetts Institute of Technology (MIT) (Freeman, 1995). SAGE was a system of large computers and associated network equipment that coordinated data from many radar locations and processed them to produce a unified image of airspace over a wide area. The processing power behind SAGE was supplied by the largest discrete component-based computer ever built, the AN/FSQ-7, manufactured by IBM (IBM History, 2025). SAGE was operating in this role from the late 1950s into the 1980s.

During the 1960s, a major confrontation between the two superpowers occured, leading to an exhausting arms race. New types of weapons and military equipment were being developed at a high rate. Microelectronics and, based on it, telecommunications and computing equipment were developing especially quickly, which in turn became a powerful platform for the development of C2IS for weapons control.

During the 1960s, the USA and NATO began integrating digital computers into C2IS. The Tactical Fire Direction System (TACFIRE) was a computer based system for support of USA Army artillery units (Salisbury, 1979).

The Tactical Air Control System (TACS) is the USA Air Force's C2IS for planning, coordinating, and managing air operations in support of joint and combined operations. It integrates various ground, airborne, and space-based assets to ensure effective air support for military operations.

A version of TACS, a so-called distributed TACS, consists solely of ground-based C2 nodes separated by hundreds of kilometers. Erlang analysis yielded a message queuing time of 20 seconds and 97% voice channel availability (Bausch, 1987). TACS is a roofing system whose origins date back to the 1940s and continues to evolve with new AI-driven battle management, improved multi-domain operations, and enhanced connectivity with space and cyber warfare assets.

In the late 1960s, the USA and NATO began developing digital systems like JTIDS (Joint Tactical Information Distribution System) and AWACS (Airborne Warning and Control System) (Brick and Ellersick, 1980).

The JTIDS project was initiated with an advanced planning study sponsored by the USA Air Force Electronic Systems Division and conducted by the MITRE Corporation in 1967. JTIDS is an L band (1 to 2 GHz) Distributed Time Division Multiple Access (DTDMA) radio network used to support data communications needs, mainly for air and missile defense. It produces a spread spectrum signal using Frequency-Shift Keying (FSK) and Phase-Shift Keying (PSK) to spread radiated power over a wider range of frequencies than conventional radio transmissions. This reduces susceptibility to noise, jamming, and interception (Fried, 1978; Golliday, 1985; Roetzheim, 1987; Wang et al, 2005).

The JTIDS project underwent several phases of development and implementation. By the 1990s, it was largely operational and widely deployed across USA and NATO forces.

At the beginning of 2000s, JTIDS was succeeded by the Multifunctional Information Distribution System (MIDS) which provided smaller, more efficient, and interoperable terminals. So, while JTIDS itself was not officially finished, its role was gradually phased out in favor of MIDS (Collins Aerospace, 2025).

AWACS is an airborne C2 platform designed for surveillance, battle management, and airspace control. It provides real-time intelligence, tracking, and coordination of air operations.

The Tactical Air Control System (TACS), the Joint Tactical Information Distribution System (JTIDS), and the Airborne Warning and Control System (AWACS) are all key components of the USA Air Force's C2 network. They work together to provide real-time situational awareness, air and space management, and secure communication to provide commanders with effective decision-making support.

Soviet C2 information systems were specialized military systems designed to provide situational awareness and facilitate communication, coordination and decision making across different types, branches and

services of the Soviet armed forces. These systems were crucial for both conventional and nuclear warfare (Donnelly, 1976).

ASUV (Автоматизированная система управления войсками - Automated troop control system) was the first Soviet C2 information system introduced in 1960s. It was a semi-automated C2IS similar to its Western counterpart SAGE. ASUV was designed to support decision making and coordination of forces, including tank formations and frontal aviation management. It consisted of subsystems for managing the Army, the Air Force, the Air Defense, and the Rear Management (Sterling, 1985; Военное обозрение, 2013).

Later, in the 1970s and 1980s, the Soviet Union developed its own digital computer-based C2 information system. In comparison to NATO's systems, Soviet's systems are more centralized, less advanced in computing and have a stronger focus on a strategic-level C2IS rather than tactical digitalization. They allow real-time tracking of threats across the ex-Warsaw Pact nations and enhance rapid decision making in specific types and branches, such as (Sterling, 1985; Военное обозрение, 2013; Herspring, 1990; Военное обозрение, 2012):

- Manevr[1] (Манёвр) – C2 information system for ground forces at operational-tactical levels,
- Vozdukh (Воздух) – air defense C2 information system, integrated with radar networks,
- Legend (Легенда) – naval surveillance and targeting C2 information system,
- Signal (Сигнал) – C2 information system for strategic missile forces,
- Kazbek (Казбек) – high-level nuclear C2 information system, linked to the Cheget briefcase carried by the Soviet leadership, and
- Cheget (Чегет) – C2 information system used to authorize nuclear strikes.

Soviet C2ISs use landlines, radio, and satellite communications to ensure redundancy in case of NATO strikes, as well as hardened underground bunkers and mobile command centers. They are highly centralized with decision making concentrated in the General Staff (Генеральный штаб) and the Ministry of Defense (Министерство обороны СССР).

[1] Sometimes, non-Russian sources may mistranslate or misinterpret "Manevr" as "Maneuver".

The Soviet C2 doctrine emphasized deception (маскировка) to confuse adversaries and heavy use of electronic warfare (EW) to disrupt NATO communications (Ivanov et al, 1977).

Modern military C2IS

For the past 80 years, C2IS development has evolved from manually operated systems in 1940s to AI-driven, real-time, networked battle management systems today.

It can be said that the era of modern C2IS began in 1990s. Since that time, the focus has been on multi-domain operations, decentralization and autonomous decision making, efficient data management, and cybersecurity. Fort he last few years, the central focus has been on the integration of AI into C2 information systems.

USA and NATO

NATO's primary Joint Command and Control (JC2) information system is crucial for ensuring interoperability and military coordination among the NATO member states, enabling them to operate effectively in joint operations. The new USA military intiative Joint All-Domain Command and Control (JADC2) information system aims to enhance this capability of real-time data exchange by integrating sensors and systems from all military types, branches and services. AI enables new and unimagined possibilities for the C2IS. An analytic framework for identifying and developing AI command and control applications for modern warfare is presented in (Lingel et al, 2020). The authors examine and recommend opportunities for applying AI and automation to deliberate planning for JADC2.

Information from all domains (land, sea, air, space, and cyberspace) is processed in a unified JADC2 network, using cloud computing, big data analytics and AI to improve situational awareness and accelerate decisions (Deptula, 2022).

The development of the JADC2 information system involves multiple contracts awarded by the U.S. Department of Defense (DoD) to various companies. Each of these contracts has a ceiling value of $950 million, structured as indefinite-delivery/indefinite-quantity (IDIQ) agreements. This structure allows the DoD to issue task orders up to the specified ceiling during the term of the contract. Notable recipients of these contracts include Aptima, Science Applications International Corp. (SAIC) and Oceus (Aptima, 2025; Businessware, 2020; Businessware, 2022).

Given that multiple companies have been awarded these $950 million ceiling contracts, the cumulative potential investment in the JADC2 development is significant. However, the exact total expenditure depends on the specific task orders issued and executed under each contract, which may vary and not necessarily reach the maximum ceiling. Therefore, while the awarded contracts suggest a significant financial commitment to JADC2, the precise total cost of its development remains variable and contingent upon future DoD decisions and budget allocations. In fiscal year 2024, the DoD requested $1,8 billion for AI and $1,4 billion for the JADC2 initiatives (Harper, 2023).

JADC2 consists of several subsystems, such as:

- LC2IS (Land C2 Information System),
- MC2IS (Maritime C2 Information System),
- AC2IS (Air C2 Information System),
- Space C2IS (Space C2 Information System),
- Cybersecurity C2IS (Cybersecurity C2 Information System), and
- LOGFAS (Logistics Functional Area Services) – Logistics planning and managing system.

The development cost of LOGFAS is not explicitly detailed in open sources. However, a related modernized version, the Logistics Functional Services (LOG FS), which aims to replace LOGFAS, was initially allocated €30 million. This budget is expected to increase due to the additional requirements and approval processes (Pecina and Dufek, 2016; Pecina and Husak, 2018).

The NATO Integrated Air and Missile Defence System (NATINAMDS**)** is NATO's overarching C2 framework for coordinating air and missile defence across allied European nations. It ensures a unified approach to detecting, tracking, and countering airborne threats, including aircraft, cruise missiles, and ballistic missiles (NATO IAMD, 2025).

FBCB2 (Force XXI Battle Command Brigade-and-Below)[2] is the USA and NATO tactical C2 information system to provide real-time situational awareness, digital C2, and friendly force tracking at the brigade level and below, introduced in the late 1990s. It provides ground forces, armored vehicles, aviation, and joint forces with a unified picture of the

[2] The Force XXI Battle Command Brigade-and-Below (FBCB2) and Blue Force Tracker (BFT) are closely related systems, with BFT being a satellite-based extension of the FBCB2 program (Army Programs FBCB2/BFT, 2025).

battlefield (Army Programs FBCB2, 2025). Since 2015, FBCB2 has been upgraded to the JBC-P (Joint Battle Command-Platform) with improved interfaces, faster satellite connectivity, and cybersecurity enhancements. The development of the JBC-P began in 2010. The combined planned development and procurement funding for the JBC-P program through fiscal year 2018 was approximately $824 million (Studylib.net, 2014).

The Nett Warrior system is a soldier-level situational awareness C2 information system, designed to enhance infantry with real-time digital battlefield data (Nett Warrior, 2015). It is part of the Integrated Tactical Network (ITN) and serves a similar role to Russian Strelets.

The AN/MLQ-44 is a tactical EW system used by the USA Army. Electronic intelligence (ELINT) platforms are designed to intercept electromagnetic signals for radio communications (Hitchens and Valasek, 2006).

Russian Federation

The Russian Armed Forces employ a mix of Soviet legacy and modern digital C2 systems to support their military operations, including space, electronic, and cyber warfare. These systems are designed to enhance situational awareness and coordinate military multi-domain operations at the strategic, operational, and tactical levels (Poulsen and Staun (eds.), 2021).

The Russian strategic-level C2 information system is Akatsiya-M (Акация-М). It serves as the backbone of the Russian C2 information system which integrates data from all domains (land, sea, air, space, and cyberspace) and supports automated decision making and real-time coordination of military operations for the Russian General Staff and high-level military command centers (McDermott, 2019-a; McDermott, 2019-b). It is used for strategic missile forces.

Another strategic-level C2 information system is Kazbek (Казбек**)** – the nuclear command and control system, linked to the Cheget briefcase.

Andromeda-D (Андромеда-Д) is a C2 information system developed for Russian Airborne Troops (VDV – Воздушно-десантные войска)**.** It integrates satellites, drones, radio communications, and radio reconnaissance into a single network for real-time troop and artillery situational awareness and operational coordination. Andromeda-D is a critical system of Russia's airborne warfare strategy (Withington, 2025; McDermott, 2019-a).

ESU TZ (Единая Система Управления Тактического Звена) is a tactical-level C2 information system for the brigade level and below. It supports mechanized and infantry units with real-time battlefield data

from drones, and uses AI for decision support and automated targeting. ESU TZ is integrated with EW units. This system is similar to NATO's FBCB2 (Live Journal, 2025).

Polyana-D4M (Поляна-Д4М) is a C2 information system developed for Russian Aerospace Forces[3] (Воздушно-Космические Силы), which is a branch of the Russian Armed Forces combining air and space capabilities. It provides real-time situational awareness from satellites and radar systems, coordinates the work of various air defense systems, such as Buk-M3, Pantsir-S1, S-300, S-400, S-500 missile defense systems, and integrates air force units with early warning systems for missile defense (Dbpedia.org, 2025; Poulsen and Staun (eds.), 2021).

Strelets (Стрелец) is a soldier-level situational awareness system for infantry. It provides GPS-based navigation, secure communication, and targeting assistance. Strelets is used by Russian Special Forces (Силы специального назначения - Спецназ) and mechanized infantry.

Borisoglebsk-2 (Борисоглебск-2) is an EW system aimed to disrupt enemy's C2 capabilities. It jams communications, satellite navigation (GPS, GLONASS, Galileo), and radar signals in the frequency range from 1.5 MHz to 2 GHz. The Krasukha-4 (Красукха-4) is specialized to jam airborne early warning radars (AWACS), drones and satellite communication links (Uppal, 2024).

The RuNet (Рунет) is the Russian sovereign internet infrastructure that reduces dependence on the global system and provides resilience to cyberattacks or external disconnection. It ensures military communications remain operational if the global internet is cut off.

People's Republic of China

The People's Liberation Army (PLA) has been actively developing and integrating advanced C2 information systems to enhance its military capabilities (Scobell and Kamphausen, 2007). The PLA has undergone many changes since Xi Jinping became general secretary of the Communist Party of China in 2013. Efforts at modernising the PLA have been conducted in earnest for the past 10 years through the overhaul of the organisation and the introduction of latest technologies to make it battle-ready. These systems integrate advanced AI, big data, satellite networks, and cyber capabilities (Bommakanti and Amjad, 2023; Alsaied, 2023). However, for security reasons, detailed technical specifications remain classified. There are no widely known or publicly confirmed

[3] On August 1, 2015, the Russian Air Forces and the Russian Aerospace Defence Forces were merged to form the Russian Aerospace Forces.

Chinese military C2 systems in authoritative defense publications or PLA documentation.

According to DeepSeek, Qin Tian and Jian Bing are two distinct strategic-level Chinese military satellite C2 information systems, each serving different roles in the PLA space and reconnaissance infrastructure. The difference between the Qin Tian and Jian Bing C2 information systems lies in their respective applications and operational frameworks. Qin Tian is designed to provide situational awareness, facilitate decision making, and enable centralized control over operations. Jian Bing refers to a different kind of C2 systems, more focused on surveillance, reconnaissance, and cybersecurity of digital infrastructure.

Zhong Jun is a tactical-level C2 system for the brigade level. Using AI, this system integrates signals received from drones and EW warnings.

According to (Demarest, 2023), China is developing its own version of JADC2 to counter the USA.

India

The Indian Integrated Defence Staff released the first-ever public joint doctrine for the Indian Armed Forces (JDIAF-2017) in April 2017. Within this doctrinary document, “C2 is underpinned by a philosophy of centralised intent and decentralized managing” (Rej, A. and Joshi, S. 2018).

Indian military C2 systems are used to plan, coordinate, manage, and control operations across all domains: land, air, sea, space, and cyber. These systems are critical for ensuring situational awareness**,** decision making, and operational effectiveness in both peacetime and wartime scenarios. In the last few years, research efforts have been focused on integrating AI, cyber technology, and quantum technology into the Indian Armed Forces (Pant and Bommakanti, 2023).

The Integrated Strategic Command System (ISCS) is a critical component of the Indian nuclear C2 infrastructure, ensuring the secure and effective management of its strategic forces. It is designed to facilitate decision making at the highest levels of government and military leadership while maintaining strict control over nuclear assets (Borja and Ramana, 2020).

The Integrated Air Command and Control System (IACCS) is a sophisticated network linking radars, AWACS, ground stations, and fighter aircraft. It provides real-time situational awareness and rapid response capability, and acts as the backbone of the Indian air defense command network (IndraStra Global, 2015; BEL C4ISS. 2025).

The Naval Command Control Communication Intelligence (NC3I) network is an interconnected coastal command and control system capable of collecting data from coastal radars, ships, submarines, aircraft, and satellites in Gurgaon, a city just outside the capital city of Delhi. The Indian Navy has also constructed multiple communication centres for transmitting messages in the VLF bandwidth to its submarines (Pandit, 2014a; Pandit, 2014b).

The Command Information and Decision Support System (CIDSS) is a C2 system to support tactical decision making**,** which offers real-time data sharing and battlefield visualization. It interconnects various units within systems like artillery, logistics, and electronic warfare (BEL CIDSS, 2025).

The Battlefield Surveillance System (BSS) is a mobile C2 system capable of integrating data from drones**,** sensors, and reconnaissance units, processing and fusing them. In that way, it enhances situational awareness on the battlefield and aids the commander in decision making, particularly in border areas (BEL BSS, 2025).

United Kingdom

The United Kingdom (UK) uses advanced C2 systems across all its military forces to ensure effective planning, coordination, and managing of operations. These systems integrate intelligence, surveillance, communications, and data processing to support joint and multi-domain operations. The UK's military C2 systems are evolving towards greater integration, automation and multi-domain operations to ensure the UK remains a key player in NATO.

The UK's strategic military C2 information systems are evolving to meet complex and diverse threats, particularly in air and missile defense, space, and joint operations.

GUARDIAN is a new C2IS designed to protect against aerial threats by linking radars and radios across the UK and NATO to provide a real-time air picture. It supports rapid decision making and fighter jet deployment to intercept or escort suspicious aircraft. GUARDIAN was developed with IBM and has been operational since 2022 (DE&S, 2022).

Also, the UK is developing the Borealis space system to protect military satellites by providing timely, interoperable information to commanders, enhancing space domain awareness (Borealis, 2025).

The UK military uses several tactical C2 systems designed to enhance situational awareness, force tracking, and communication at the tactical level.

The BAE Tactical Command and Control (TC2) system enables real-time tracking of vehicles and soldiers throughout the chain of command, providing a comprehensive operational picture. It improves situational awareness and enables forces to communicate operational intelligence up and down the chain of command (BAE TC2, 2025).

LETacCIS (Land Environment Tactical Communication and Information Systems) is a UK Army programme aimed at delivering the next generation of C4I information systems to support land environment operations, enhancing connectivity and information sharing at the tactical level (LETacCIS, 2023; BattleSpace, 2023).

France

The French military employs sophisticated and evolving C2 systems across its armed forces, integrating air, land, naval, and space domains. These systems emphasize interoperability, resilience, and modernization to meet contemporary operational demands.

SCCOA (Système de Commandement et de Conduite des Opérations Aérospatiales) is a networked C2 system integrating radar, AWACS, and ground-based assets for real-time situational awareness (RDN, 2025).

SICF (Système d'Information pour le Commandement des Forces) is a C2 information system in service with land forces at tactical levels from the headquarters to the brigade. SIA (Système d'information des Armées) is a unified C2 system for the Army and the Navy. SICF and SIA are produced by Thales (Thales, 2016).

Israel

Israeli military C2 systems are highly advanced and integral to its defense operations across multiple domains.

Tirat Ha'Agam (Castle of the Lake) is the primary C2 system used at the General Headquarters level, providing a real-time, comprehensive battle picture for decision makers. It supports operational processes from routine actions to total war scenarios and is designed for stationary use with robust IT infrastructure integration. The system has been under continuous development since the late 1990s (IsraelDefense, 2016).

The Citron Tree and the Golden Almond are C2 systems which integrate data from multiple sensors to create a unified aerial threat picture and coordinate interceptors against ballistic missiles, rockets, drones, and aircraft. They employ advanced algorithms and AI to optimize target tracking and interception (Elbit, 2024).

The Orion Handheld C2 system consists of thousands of smartphone-like ruggedized terminals that have been delivered to infantry units to replace paper maps with a digital geographic information system (GIS). They offer 3D imagery of the battlespace and improve situational awareness and planning at the tactical level (Janes, 2022).

Conclusion

A command and control information system (C2IS) is a technical system designed to provide decision makers with the information they need to plan, coordinate, and manage operations. It integrates data from various sources, processes it, and presents it in a way that helps decision makers (commanders) effectively plan, coordinate and manage operations. C2IS can be intended for military applications, public safety, and corporate management. This article focuses on C2IS for military applications. The development of military C2IS began in the mid-20th century. Over the past 80 years, C2IS have evolved from manually operated systems of the 1940s to modern systems driven by artificial intelligence today. The era of modern C2IS can be said to have begun in the 1990s. Since then, the focus has been on decentralization and autonomous decision making, efficient data management, and cybersecurity. In recent years, the central focus has been on the integration of AI into C2IS.

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Командно-контролни информациони системи за војне примене

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ОБЛАСТ: информационе технологије
ВРСТА ЧЛАНКА: прегледни рад

Сажетак:

Увод/циљ: Командно-контролни информациони систем (ККИС) јесте технички систем дизајниран да обезбеди потребне информације доносиоцима одлука за планирање, координацију и управљање операцијама. Састоји се од хардвера и софтвера, а укључује специјализовани скуп алата и процеса, који имају за циљ да обезбеде благовремен и тачан проток информација. Може бити намењен за војну примену, јавну безбедност и корпоративно управљање. У раду је представљен историјски развој војних ККИС. Наведени су примери модерних ККИС неких технолошки развијених земаља, као што су САД (НАТО), Руска Федерација, НР Кина, Индија, Велика Британија, Француска и Израел.

Методе: Овај чланак је преглед 60+ референци које се односе на историјски развој војних ККИС, као и на модерне ККИС неких технолошки развијених земаља.

Резултати: На основу наведених референци, у раду је сумиран историјски развој ККИС за војну примену, и представљен кратак преглед модерних ККИС седам технолошки развијених земаља.

Закључак: Командно-контролни информациони системи се увелико користе у савременим војскама. Њихов развој започео је средином 20. века. Током протеклих 80 година ККИС су еволуирали од ручно управљаних система из 1940-их до модерних система који су данас вођени вештачком интелигенцијом. Ера модерних ККИС почиње 1990-их, од када је фокус на децентрализацији и аутономном доношењу одлука, ефикасном управљању подацима и сајбер безбедности. Последњих неколико година централни фокус је интеграција вештачке интелигенције у ККИС.

Кључне речи: одбрамбене технологије, командно-контролни информациони системи, информатика, телекомуникације

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