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FROM FRAGMENTATION TO INTEGRATION: THE EVOLUTION AND FUTURE OF RMA IN SOUTH KOREA

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ABSTRACT

What is new?	This paper presents the first comprehensive analysis of the evolution, challenges, and future directions of Research Management and Administration (RMA) in South Korea, a global leader in R&D investment and innovation. It offers new insights into South Korea's transition from a fragmented RMA system to a more integrated and professionalized model.
What was the approach?	By employing a historical and policy analysis approach, this study traces the development of RMA in South Korea from the 1960s to the present. It examines key regulatory milestones and their impact on the R&D ecosystem, incorporating governmental reports and relevant policy documents to provide an understanding of the systemic challenges and opportunities in RMA.
What is the academic impact?	The findings contribute to academic literature by positioning South Korea as a case study in RMA systematization and policy integration. It fills a critical gap in the understanding of how RMA evolves in high-performing R&D ecosystems and provides a framework for analyzing similar systems in other countries.
What is the wider impact?	The findings of this study have significant implications for policymakers, analysts, and R&D stakeholders. By identifying the challenges and opportunities in South Korea's RMA system, the paper offers actionable

recommendations for aligning RMA with global best practices.

Keywords RMA, Research Management, Research Administration, South Korea, R&D Ecosystem, Policy Integration.

INTRODUCTION

Research management and administration (RMA) represents a pivotal, yet insufficiently explored, element within research and innovation ecosystems. As National Innovation Systems (NIS) have evolved globally, RMA has emerged as essential infrastructure encompassing professional activities that support the entire research lifecycle, from pre-award planning to post-award compliance and impact evaluation (Kerridge & Scott, 2018; Monahan et al., 2023). Research managers and administrators serve as strategic intermediaries, facilitating the translation of policy into practice through key functions such as grant writing, financial management, project oversight, and regulatory compliance (Kotecha et al., 2024).

The professionalization of RMA has followed distinct developmental trajectories across advanced economies. The field's institutionalization began with the establishment of the National Council of University Research Administrators (NCURA) in 1958, followed by the formation of the Society of Research Administrators International (SRAI) in 1967. Expansion into Europe occurred through the creation of the Association of Research Managers and Administrators (ARMA) in the United Kingdom in 1991, and the European Association of Research Managers and Administrators (EARMA) in 1994, both of which have emphasized structured certification and continuous professional development (Kulakowski, 2023). Subsequently, Japan formalized RMA through the introduction of certification systems led by the University of Tokyo.

This global trend toward RMA professionalization stands in stark contrast to the experience of South Korea. Since joining the OECD in 1996, South Korea has emerged as a global powerhouse in science and technology (S&T), boasting one of the world's most advanced digital economies and leading industries such as electronics, automobiles, steel, and shipbuilding (OECD, 2021). Over the past 25 years, Korea's NIS has undergone remarkable development, with R&D expenditure reaching twice the OECD average by 2019 (Figure 1).

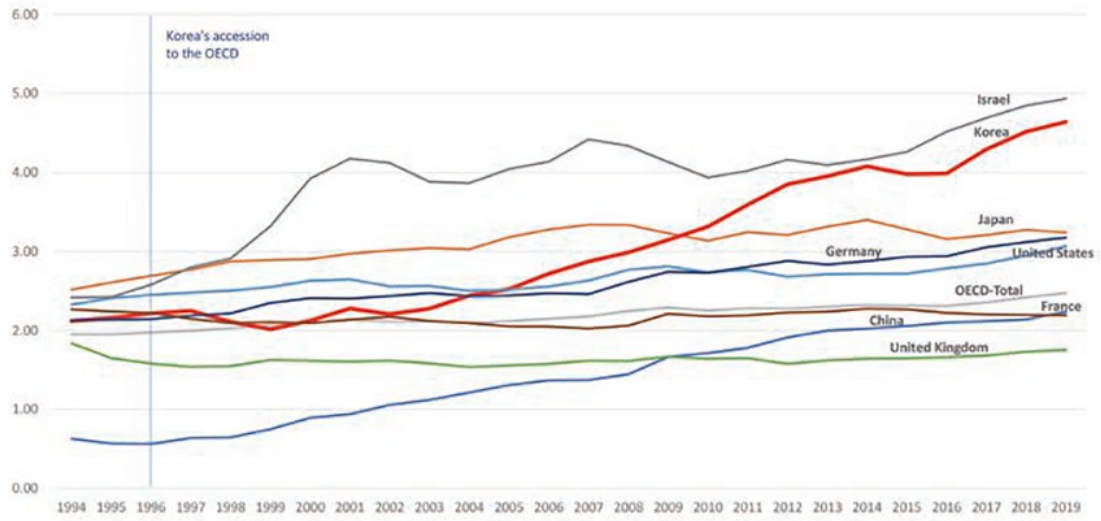

Figure 1. Gross expenditure on research and development (GERD) as a percentage of GDP Source: OECD (2021). Retrieved from http://oe.cd/msti via OECD STI Scoreboard platform (https://stip-pp.oecd.org/Stats/StatTrends_online.html, data extracted 22 July 2021). Currently available at: https://www.oecd.org/en/publications/korean-focus-areas_f91f3b75-en/ a-global-powerhouse-in-science-and-technology_61cbd1ad-en.html.

South Korea's rise as a leading innovation powerhouse is particularly notable given its historical trajectory—from an agrarian society under Japanese colonial rule to a war-ravaged nation and, eventually, an advanced economy. In 2023, South Korea ranked first in the Bloomberg Innovation Index, reaffirming its role as a hub for scientific advancements and high-quality research (Bloomberg, 2023).

Despite these successes, RMA—a critical component of an efficient research and innovation ecosystem—has often been overlooked. Traditionally perceived as a subsidiary function focused on project budget management rather than a strategic pillar of national R&D policy, RMA in South Korea has historically suffered from fragmentation and insufficient institutional prioritization. This has resulted in inefficiencies and missed opportunities for optimizing research outcomes.

This study seeks to address this gap by providing a comprehensive analysis of the evolution, challenges, and future directions of RMA in South Korea. It traces the historical development of RMA policies, identifies systemic inefficiencies, and proposes actionable recommendations for aligning South Korea's RMA framework with global best practices. By examining the country's journey from fragmentation to integration, this paper contributes to the global discourse on R&D policy and offers a model for other nations seeking to enhance their RMA ecosystems. Ultimately, this study aims to provide insights for policymakers and stakeholders to improve the effectiveness and efficiency of RMA administration services.

METHODOLOGY

This study adopts a historical-institutional and policy analysis framework to systematically trace the evolution of RMA in South Korea from the 1960s to the present.

Up to the early 2020s, the South Korean government prioritized administrative efficiency and policy coherence primarily through the establishment of legal foundations and the development of digital infrastructure for research governance.

The methodological approach consists of a comprehensive review of regulatory milestones and institutional trajectories. Primary sources include official government documents and legal statutes, notably the Framework Act on Science and Technology (2001) (Republic of Korea, 2001) and the National R&D Innovation Act (2021) (Republic of Korea, 2021), as well as strategic planning reports issued by the Ministry of Science and ICT (MSIT). These are supplemented by secondary data from international sources, such as the OECD Science, Technology and Innovation Indicators, and by relevant academic literature on RMA governance and reform.

To explore how the Korean government has implemented research administration reforms through digital infrastructure, this study conducts a systematic analysis of major national research management information systems—including NTIS, Ezbaro, RCMS, and IRIS.

By contrast, the emergence of professional research administrators as a distinct policy focus is relatively recent. Due to the limited implementation period and insufficient longitudinal data, an empirical evaluation of their effectiveness falls outside the scope of this study.

Historical Context: The Foundations of RMA in South Korea

The South Korean case presents a valuable study of economic and technological transformation due to its exceptionally compressed timeframe of development, spanning only five decades. Korea is considered a unique case of an aid recipient having successfully turned into an advanced country in the latter half of the 20th century (Park, 2019).

Emerging from Japanese colonial rule and the devastation of the Korean War, South Korea began its socio-economic development with virtually no industrial infrastructure, skilled workforce, or institutional foundation. Recognizing the crucial role of science, technology, and education in national development, the government placed these areas at the core of its economic strategy.

The roots of South Korea’s RMA system can be traced back to the 1960s when the government began laying the groundwork for a structured R&D ecosystem. Under President Park Chung-hee’s administration, the country transitioned from reliance on foreign technology imports to fostering indigenous industries, initially focusing on labor-intensive sectors such as textiles and clothing.

R&D support was central to South Korea's first Five-Year Economic Development Plan, exemplified by the establishment of the Korea Institute of Science and Technology (KIST) in 1966 (Nature, 2020). As the first government-funded research institute (GRI), KIST's non-profit structure allowed operational autonomy, enabling flexible responses

to the changing research environment. This model laid the groundwork for the subsequent proliferation of GRIs, significantly expanding national research capacity.

In 1967, the government enacted the Science and Technology Promotion Act, establishing a legal framework for national R&D policy, defining governmental roles in S&T development (Yoon, 2014).

Despite early efforts, RMA remained underdeveloped because the government and researchers prioritized expanding research funding while viewing lean administration as most efficient.

The distribution of R&D expenditure has long been dominated by the business sector, which accounted for 79.2% in 2023, while universities (9.1%) and Government Research Institutes (GRIs) (11.7%) remain comparatively smaller players. For GRIs, only 37% of their 2025 budgets come from stable institutional funding, with the rest reliant on competitive grants (48%) and industry collaboration (14%). This dependence on external resources highlights their structural vulnerability, though the new administration has pledged to phase out the Project-Based System (PBS) applied to 23 government-funded institutes (KISTEP, 2024).

The Common Management Regulation Era (2000s–2015)

By the early 2000s, concerns over administrative inefficiencies and policy inconsistencies led to the enactment of the Framework Act on Science and Technology in January 2001 (Republic of Korea, 2001). However, due to its declarative nature, the Act lacked specific implementation mechanisms (KERI, 2003).

To address these issues, the government introduced the "Regulation on the Management of National R&D Programs" (Republic of Korea, nd), commonly referred to as the Common Management Regulation (CMR). This regulation aimed to standardize research management processes across ministries, alleviating administrative burdens on researchers stemming from inconsistent funding procedures and redundant reporting requirements (Lee & You, 2020).

Despite these efforts, the absence of a legal foundation for multi-ministerial R&D program management led to continued ambiguities in oversight and coordination. Moreover, the CMR's implementation as an executive order limited its enforceability, resulting in inconsistent adoption across ministries.

To improve national R&D coordination, MSIT launched the National Science and Technology Information Service (NTIS) in 2006. NTIS serves as a national portal for integrating and providing meta-information on national R&D projects, including project details, outcomes, personnel, and research equipment information. By integrating R&D information previously managed by individual ministries, NTIS aims to enhance the efficiency of national R&D investment (Shin, et al., 2011).

In 2015, the government introduced the Evaluation of Research Budget Management System to assess universities and research institutions on financial transparency and institutional efficiency, influencing the allocation of indirect costs.

Digital Transformation and Policy Reforms (2016–2021)

As of 2020, South Korea had 286 different research management regulations and 59 separate research management information systems in operation across government agencies (MSIT, 2023). This fragmented system reduced effectiveness of the CMR, as separate laws and regulations across ministries resulted in overlapping and sometimes contradictory administrative requirements, increasing bureaucratic burdens on researchers. Therefore, there has been a persistent call for an independent law to provide legal authority and effective governance to what is currently addressed by the CMR (Yoo & Cha, 2011).

To address these challenges, MSIT launched an initiative in 2017 to develop integrated research management information systems, consolidating multiple research management platforms into two—Ezbaro and RCMS—with two components, i.e. budget management and financial reporting.

The 4th Basic Plan for Science and Technology (2018–2022) included "the establishment of a research-immersive environment centered on researchers" as one of its key tasks. It also proposed measures to streamline administrative procedures and enhance the autonomy in the use of research funds, such as restructuring the legal frameworks governing R&D management across ministries and integrating the research management systems (MSIT, 2018).

Recognizing the need for a legally-binding framework to support integrated R&D governance, the government enacted the National Research and Development Innovation Act in 2021 (Republic of Korea, 2021). The Act introduced the concept of “research support”, defined as direct or indirect assistance provided by research and development institutions to their affiliated researchers, including personnel, facilities, equipment, and ICT systems essential for executing R&D projects.

The law stipulates that the MSIT Minister establish and operate an integrated information system for the efficient national R&D project management, with relevant ministries required to cooperate in this effort. Accordingly, the Integrated Research Information System (IRIS) was formally launched in 2022 as a cross-ministerial research support platform (see IRIS (nd)). It is designed to streamline and support the entire national R&D project lifecycle—from proposal submission and evaluation to project management and outcome reporting—within a single integrated platform. In contrast, EZBARO and RCMS now function as specialized subsystems within IRIS, with their original roles streamlined and partially reduced, primarily facilitating the comprehensive management of research budget.

While both NTIS and IRIS provide information on national R&D programs, their scopes and user bases differ: NTIS disseminates national science and technology knowledge to

researchers and the public for improved investment efficiency, whereas IRIS supports integrated research administration for researchers and administrators throughout all project phases.

Research Administration Service Innovation (2022–Present)

In February 2024, President Yoon Suk-yeol emphasized the need for South Korea's research innovation ecosystem to achieve a 'quantum leap', highlighting the importance of strengthening networks between R&D managers in universities and research institutions.

Following this directive, MSIT developed the 'Strategies for Advancing Research Administration Services', which was approved by the National Science and Technology Advisory Council in August 2024 (MSIT, 2024). The plan formally integrated RMA into the national R&I policy framework, acknowledging its long-standing omission from government discussions.

RMA has been marginalized in governmental R&D policy, increasing the administrative burden on faculty and researchers (MSIT, 2024). This fragmentation hindered coordination and standardization. The absence of a cohesive framework for RMA has led to inefficiencies, reducing the overall effectiveness of research support systems.

The plan aims to enhance RMA by integrating it into the broader R&D policy framework, disseminating best practices through top-tier institutions, and fostering a self-sustaining ecosystem led by the private sector. To achieve this, the plan focuses on promoting autonomous innovation in RMA by enhancing personnel expertise and improving working conditions, innovating regulations, and creating a public-private cooperative ecosystem through legislative support and professional networks, ultimately driving sustainable growth in RMA (Figure 2).

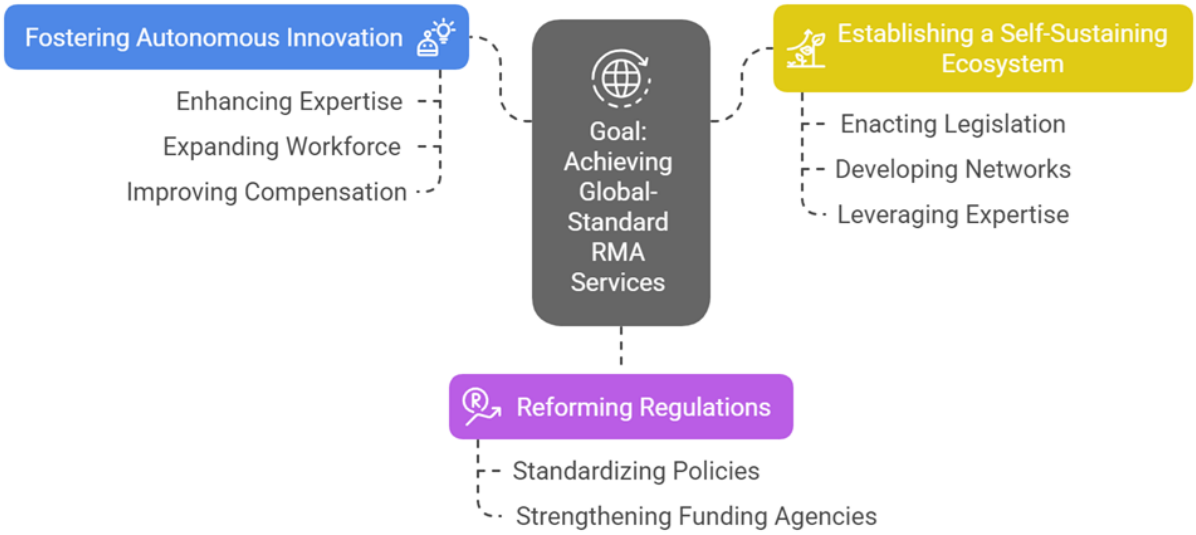

Figure 2. Goal and Key Tasks of 'Strategies for Advancing Research Administration Services' Note: This figure was created with the assistance of *napkin*, an AI-powered program. Source: PACST, Strategies for Advancing Research Administration Services, April 26, 2024, https://www.pacst.go.kr/jsp/council/councilArchiveView.jsp?archive_id=1159& (in Korean)

In response to recent shifts in governmental science and technology policy, recognition of the pivotal role of RMA has grown markedly across the national R&D landscape—including within universities, public research institutes, and among individual researchers and faculty members. This heightened awareness has catalyzed a broad-based demand for the establishment of a comprehensive, professionalized, and sustainable RMA ecosystem capable of supporting the increasingly complex needs of South Korea's research and innovation system.

Concurrently, research communities have called for strengthened RMA infrastructure and personnel to alleviate administrative burdens and allow researchers to concentrate more fully on their core scientific work. These institutional and grassroots demands have begun to influence national policy agendas. Notably, the President-elect pledged to "actively foster an environment in which scientists and engineers can dedicate themselves fully to research".

Approved by the Ministry of Science and ICT (MSIT) as a non-profit incorporated association, the establishment of the Korean Association for Research Managers and Administrators (KARMA) in 2024 represents a pivotal step in this direction. Led by former Minister of MSIT, Prof. Mun-Kee Choi, KARMA is expected to play a central role in enhancing RMA capabilities, foster professional networks, and advocate for policy reforms (Figure 3). In line with statutory requirements and its articles of association, KARMA must make an annual business plan and report its implementation outcomes to the government.

Figure 3. Founders' meeting of KARMA
Note: The person fourth from the left in the front row is the Chairperson.

Conclusion and Future Directions

South Korea's RMA system remains in a developmental stage, with significant room for improvement. However, since 2020, notable progress has been made toward establishing an integrated and professionalized RMA framework. The enactment of the National Research and Development Innovation Act, along with the development of IRIS, has laid the foundation for a more structured RMA system (Figure 4). In 2024, the government introduced the Strategies for Advancing Research Administration Services, and the establishment of KARMA has further accelerated efforts toward a sophisticated RMA infrastructure and active participation in international RMA networks.

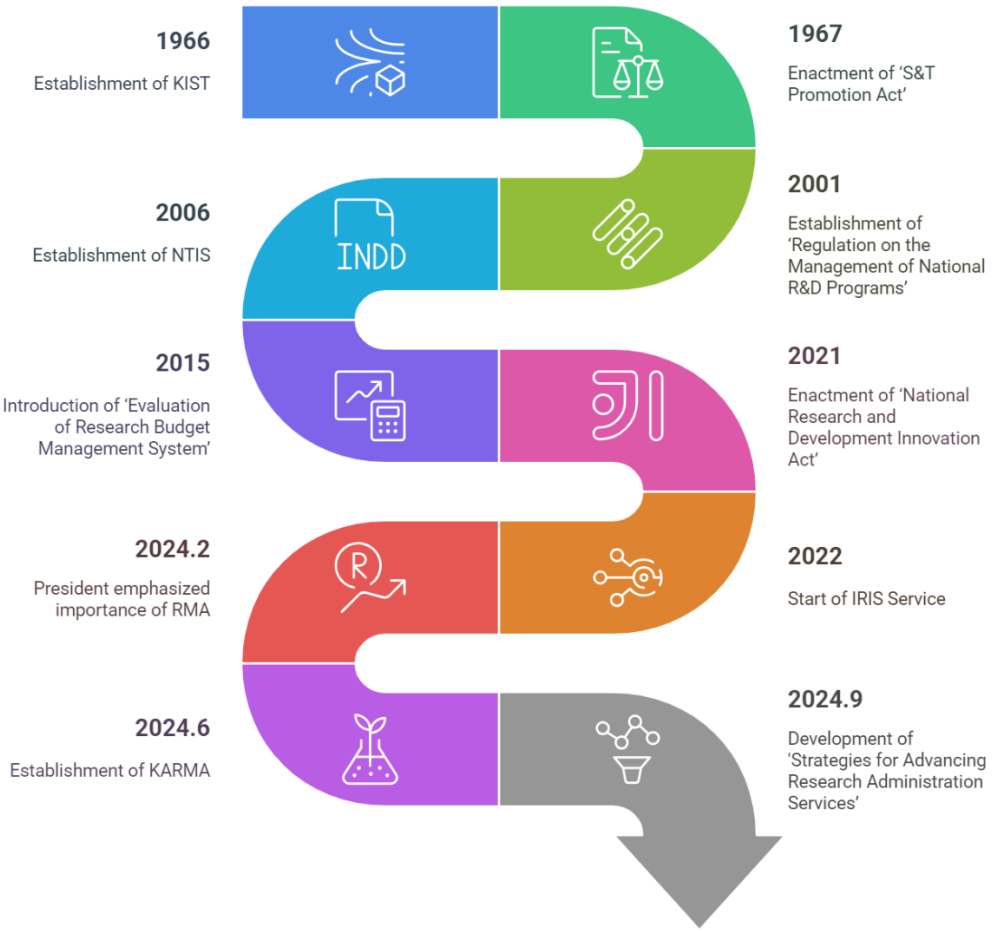

Figure 4. South Korea's Journey in RMA

Note: This figure was created with the assistance of *napkin*, an AI-powered program.

Despite these advancements, challenges remain. South Korea's RMA system has historically been characterized by centralized administrative structures in which institutional management functions—such as human resources, accounting, procurement, and general affairs—are relatively well resourced, whereas dedicated RMA personnel within R&D departments remain scarce. As a result, research administration tasks are often handled by an insufficient number of dedicated RMA professionals within R&D departments.

While some staff handle RMA tasks, their responsibilities primarily focus on budget management and accounting. Many research departments rely on temporary, non-regular staff whose contracts, often limited to two years due to labor regulations, impede the accumulation of specialized expertise.

This long-standing practice has contributed to a situation where researchers themselves handle a significant portion of administrative tasks. Consequently, there remains a need to improve researchers' understanding of the potential benefits of a robust RMA system and the necessity of well-trained, adequately compensated RMA professionals.

Addressing these issues requires a comprehensive, multi-pronged approach. A more robust RMA ecosystem is essential, necessitating enhanced networking opportunities

for professionals, the sharing of best practices, and increased access to professional development. Active participation in international RMA networks is also crucial for aligning South Korea's practices with global standards.

By building upon recent reforms and systematically tackling existing challenges, South Korea is poised to transition towards a world-class RMA system. The government's ongoing initiatives, coupled with growing institutional support and professional development efforts, position South Korea as a potential leader in research and innovation (R&I), underpinned by a globally competitive research administration framework.

To ensure that these reforms achieve their intended outcomes, future studies should systematically examine the impact of recent RMA policy changes through empirical approaches, including surveys, case analyses, and institutional performance assessments. Such evidence-based evaluations will be essential for guiding ongoing improvements and realizing the full potential of South Korea's evolving RMA landscape.

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