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Limited Western Circulation of Soviet Scientometrics: The Case of *Naukometriya*

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Abstract:

Co-authored by Vasily Nalimov and Zinaida Mulchenko, *Naukometriya* (1969) introduced the term that came to name the field of scientometrics. However, the book itself had limited impact on the development of the field outside the Eastern Bloc. This paper examines how problems of translation shaped the global circulation of one of scientometrics' foundational texts. We reconstruct the history of the book's only English version, a 1971 machine translation produced with the Systran system for the U.S. Air Force, and assess its quality using the Multidimensional Quality Metrics framework. Our analysis demonstrates that the translation introduced substantial linguistic and conceptual distortions, obscuring key ideas and plausibly contributing to the book's limited reception in the West, alongside structural factors such as restricted dissemination and geopolitical constraints. To explain why a revised translation was never published, we analyze archival correspondence between Nalimov and Eugene Garfield. We also draw on Web of Science citation data covering both the original *Naukometriya* and its English translation to reconstruct patterns of international visibility. The paper demonstrates how triangulation of bibliometric analysis, translation quality assessment, and archival sources can reconstruct the infrastructural conditions under which foundational scientometric texts circulate — or fail to circulate — across linguistic and political boundaries.

Keywords: scientific translation; scientometrics; Eastern Bloc; Soviet science; Iron Curtain.

1. Introduction

Genealogy of the emergence of scientometrics typically traces its history to contributions by Eugene Garfield and Derek De Solla Price, who laid down the foundations for the field. While Garfield introduced the Science Citation Index and founded the Institute for Scientific Information, Price conceptualized the law of exponential growth and systematically applied quantitative scientific methods to research science itself (Price, 1986). These developments have come to define the dominant, Western-centered narrative of the field's origins.

However, this narrative overshadows the fact that parallel efforts to analyze and organize science were taking place on the other side of the Iron Curtain. During the Cold War, Soviet scholars developed their own approaches to the quantitative study of science, often inspired by the goals of socialist scientific planning (Dobrov, 1966; Nalimov, 1966), while remaining attentive to developments in the West (Graham, 2015; Aronova, 2021; Kulczycki, 2023, 2024; Rousseau, 2021). Moreover, Soviet scholars were not only familiar with the existing approaches, but also creatively revised them for the realities of the Soviet academic world (e.g. Mulchenko et al., 1979; Haitun, 1983).

A central outcome of these efforts was *Naukometriya*, published in 1969 by Vasily Nalimov and Zinaida Mulchenko. The book offered one of the first systematic quantitative analyses of scholarly communication based on bibliographic data, including detailed studies of citation patterns and comparisons between Soviet and Western information flows. This contribution establishes an explicit and direct engagement with Price's work and adapts it to the Soviet scientific milieu. Indeed, the authors extensively engaged with the American scholar's approach not only in *Naukometriya* itself, but also in their prior articles (Mulchenko & Nalimov, 1967a, 1967b), as well as in Mulchenko's (1970) doctoral dissertation.

The book is also widely associated with the emergence of the term "scientometrics" described by Eugene Garfield as "the term [Nalimov] invented" (Garfield, 2001, p. 165) and as the English rendering of the title of Nalimov's monograph (Garfield, 2009, p. 174). However, despite this importance, it "was relatively unknown to Western scholars even after it was translated into English" (Garfield, 2009, p. 174).

The only complete English version of the book (Nalimov & Mulchenko, 1971) was produced in 1971 by the U.S. Air Force's Foreign Technology Division using the Systran system, one of the earliest machine translation (MT) technologies. Designed primarily for rapid orientation rather than publication, this translation rendered the title *Naukometriya* as *Measurement of Science*, significantly altering the meaning of the key term. The instability of the terminology in early English-language references – where the concept appeared in multiple forms such as "Naukometriia"/ "Naukometrija" (Beck, 1971; Garfield, 1972), "Scientometry" (Krauze, 1972; Krauze & Hillinger, 1971) and even "Sciencometry" (Mirsky, 1972) – further reflects the absence of a standardized and authoritative translation.

As a product of early machine translation, the Systran version of *Naukometriya* raises serious concerns regarding linguistic accuracy and conceptual fidelity. Both Garfield and Nalimov were aware of its limitations and considered the possibility of preparing a revised translation for publication. However, despite these intentions, no authoritative English edition of *Naukometriya* was ever produced. This stands in contrast to the existence of official translations into other languages, including Polish (Nalimow & Mulczenko, 1971) and

Hungarian (Nalimov & Mulcsenko, 1980). Nalimov mentions that translations into German in the German Democratic Republic and Spanish in Latin America were being prepared but, for reasons unknown to him, had yet to be published (Nalimov, 2001). In his autobiography, he also referred to an ongoing Chinese translation project (Nalimov, 1994).

This gives rise to a broader puzzle at the crossroads of intellectual history and knowledge circulation: how could a work regarded as a “classic monograph” by one of the field’s founding figures fail to achieve wider international visibility, and why did efforts to produce a proper English translation ultimately collapse? Existing accounts have noted the marginal reception of Soviet contributions, but they have not provided a systematic explanation of the mechanisms underlying this case.

This paper investigates how translation mediates the global circulation of scientific concepts by examining the case of *Naukometriya*. Our central research question is: how did the conditions of translation – both linguistic and material – shape the international reception of one of scientometrics’ foundational texts?

Therefore, we ask: (1) to what extent did the quality of the 1971 machine translation might distort the book’s key concepts, and (2) why did efforts to produce an authoritative English translation ultimately fail? Through this case, we show that the visibility of scientific ideas depends not only on their intellectual content, but also on the infrastructures that enable their transmission.

To address these questions, we combine historical analysis of Cold War scientific exchange, citation analysis in Web of Science covering both *Naukometriya* and its 1971 English translation, an assessment of the 1971 translation using the Multidimensional Quality Metrics (MQM) framework, as well as archival research on correspondence between Nalimov and Garfield held at the Science History Institute.

Methodologically, this paper does not aim to test a causal hypothesis linking translation quality to citation outcomes. Rather, it follows a process-tracing logic: we reconstruct the configuration of linguistic, material, and political conditions under which *Naukometriya* did or did not circulate, and ask how each of these conditions shaped its reception. We argue that the limited international visibility of *Naukometriya* resulted not simply from intellectual factors, but from the interaction of translation quality, publishing interests, and political constraints. As a result, we identify three key factors: (1) Nalimov’s insistence on extensive revisions that would effectively transform the book, (2) the limited commercial interest of ISI Press in publishing another of his works, and (3) the broader political conditions that constrained transnational collaboration during the Cold War.

The paper proceeds as follows. First, we situate *Naukometriya* within the broader context of US–USSR scholarly exchange during the 1970s–1980s. Next, we assess the quality of the 1971 machine translation using the Multidimensional Quality Metrics framework, highlighting how translation errors affected key concepts. We then present a citation analysis based on Web of Science data covering both the original Russian edition and its English translation, to reconstruct patterns of international visibility and bibliographic fragmentation. Finally, we draw on archival correspondence between Nalimov and Garfield as an interpretive source for

triangulation with the translation and citation analyses, in order to explain why an authoritative English version of *Naukometriya* was never published.

2. Background: *Naukometriya* between Cold War science and the politics of machine translation

Scientific exchange between the United States and the Soviet Union during the 1960s–1980s was shaped by a paradoxical combination of political restriction and selective openness. While the Iron Curtain limited the free circulation of knowledge, it did not fully prevent scholarly interaction. Following the relative liberalization of the Khrushchev Thaw, Soviet scientists increasingly engaged with Western research, and American institutions sought systematic access to Soviet scientific output. However, this exchange remained highly asymmetrical and tightly controlled. Travel restrictions, surveillance, and censorship continued to constrain direct collaboration, while access to Soviet publications in the West depended on fragmented and often informal channels (Hollings, 2016). As a result, the circulation of scientific ideas relied not only on intellectual demand but also on the availability of mediating infrastructures capable of bridging linguistic and political divides.

In this context, translation emerged as a critical infrastructure of Cold War knowledge exchange. The dissemination of Soviet research in the West depended heavily on institutional mechanisms such as state-controlled copyright agencies, translation programs, and international book exchanges, all operating under political and economic constraints (Prested & Magnúsdóttir, 2022). At the same time, the growing demand for rapid access to foreign scientific information (particularly in strategic and technical domains) led to the development of machine translation systems in the United States. These systems were designed not for polished publication, but for fast, large-scale processing of foreign-language materials (Vasconcellos & Bostad, 1992). It was within this framework that the 1971 English version of *Naukometriya* was produced, situating the book at the intersection of scientific ambition, technological limitation, and geopolitical urgency.

Machine translation (MT) is rooted in the American aspiration to peek behind the Iron Curtain and learn about Soviet Cold War activities. The January 1954 ‘Georgetown-IBM experiment’ marked the first public display of ‘the Dostoevsky machine’ (Gordin, 2014), a computer capable of turning Russian into English. Impressively, the end product was fully readable, even free of grammatical errors with no human intervention required. Despite limited operability: the machine was only programmed to process 250 words, taking six-seven seconds for each, and using six Russian grammar rules, it constituted a big promise for American scientific intelligence (Gordin, 2014, p. 2).

Its creator, Léon Dostert, saw language, war, and politics intertwined at many points in life. He was Dwight Eisenhower’s interpreter during World War II, organized simultaneous translation at the Nuremberg trials, and later implemented a similar system for the United Nations headquarters in New York. In 1951, he cited linguistic incompatibilities as a primary shortcoming of the newly established NATO (Gordin, 2014, p. 8). Efficient, reliable translation

was his remedy, a contribution to American national security policy, and a means of deterring another heated conflict. Machine translation was, therefore, a political instrument for scientific espionage already in its cradle.

Naturally, US government bodies wished to get their hands on these marvels of linguistic and computational thought. American MT systems were financially backed by The National Science Foundation, the Central Intelligence Agency (CIA), and the US Air Force (USAF). Estimates show that between 1956-1965 the overall MT research spending by American government and military agencies reached 13 million dollars (Pedtke, 1997, p. 3)—around 80 million today.

At USAF, one of the benefiting branches was the Foreign Technology Division (FTD) where MT was “used by scientific and technical analysts who need to keep abreast of foreign developments in a wide range of technical fields and to prevent technological surprise that could threaten the United States” (Vasconcellos & Bostad, 1992, p. 72). To cope with the ever-expanding ‘translation burden’ (Bostad, 1995, p. 1), in 1955, FTD obtained its first functional MT system, which translated Russian to English and was installed at the Wright-Patterson base in Dayton, Ohio in 1963 (Bostad, 1995, p. 1). In 1968, a programmer Peter Toma began working to update Russian-English MT in line with USAF’s needs. His invention would be dubbed *Systran*—acronym for ‘system translation’. After initial tests in early 1969 it was deemed operational by July 1970 (Hutchins & Somers, 1992, p. 176).

During this burgeoning period, the output was “a very rough hard-copy translation” according to Dale Bostad (1995, p. 2), who was employed at FTD and wrote extensive retrospectives and evaluations of its MT systems during the 1980-1990s. He elaborates that “post-editors edited the translation extensively almost rewriting it - and then the edited version was sent to a recomposition pool where it was retyped. (...) The translator picked and selected those parts of the machine translation that were valuable – certain technical terms and phrases – and worked directly from the Russian text” (Bostad, 1995, p. 2). This process rendered “a very accurate finished product,” but was too unproductive to avert a deluge of foreign material and had to be revised in 1974. Estimates for the 1970s are elusive, however, in the 1980s the yearly load averaged roughly 50,000-60,000 pages of source text (Bostad, 1986, p. 1).

MT applications run the gamut, with two distinct types at its extreme ends: a) for publication and b) for “information only” (Vasconcellos & Bostad, 1992). The first product requires a translator/post-editor to appropriately interpret the text, ensuring that readers grasp the author’s intent (Vasconcellos & Bostad, 1992, p. 58). Meanwhile, the second case allows for “a less than ideal translation (...) for the consumer who merely needs to assimilate information and is not concerned with disseminating it” (Vasconcellos & Bostad, 1992, p. 58). Similarly, pertaining to MT output quality, Bostad had priorly claimed that “the translations make no pretense to be of publication quality, the term focused translation for information content seems to best describe the process” (Bostad, 1986, p. 1).

Distinguishing translations based on what they are “for” (“for publication” vs. “for information only”) seems practical. In fact, a popular notion in translation studies is that every translation is created with a projected purpose (*skopos*), which manifests in specific, well-suited translational actions. Therefore, after a changed *skopos*, a new translation should follow (see Reiss & Vermeer, 2014). For the 1971 English translation of *Naukometriya* that standard was disregarded. The book was translated for limited scrutiny of “information only,” but then got widely disseminated, for a time remaining the only sneak-peek into Soviet scientometrics for

the Western eyes. The post-editing “for technical accuracy”, indicated in the first pages, was naturally unconcerned with linguistic naturalness, quality, or author-reader understanding. FTD post-editor Robert D. Hill was not acting as a published translator. The clash occurred with *skopos* change: from “information only” suddenly to “for dissemination.”

With that in mind, we investigate why exactly *Naukometriya* was never properly translated for the English-speaking audience. We first analyze why Garfield and Nalimov even discuss a retranslation, conducting our linguistic evaluation based on the Multidimensional Quality Metrics (MQM) framework (Lommel et al., 2014). Then, we work with the analysis of the personal correspondence between Garfield and Nalimov where they discuss the prospects of a new properly translated version of the book. These steps will allow us to identify the reasons for eventual absence of the properly done translation.

The remainder of the paper traces what happened when this *skopos*-mismatched translation became the only English access point to a foundational text — and what attempts were made, and not made, to repair the mismatch.

3. Data and Methods

We adopt a mixed-methods design. Each of the three empirical approaches: (1) translation quality assessment, (2) bibliometric variant analysis, (3) archival reconstruction, addresses a distinct condition of circulation (textual fidelity, citation visibility, publishing decision). They are integrated in the Discussion through interpretive triangulation.

3.1. Translation Quality Assessment

We conduct translation quality assessment (TQA) of the FTD rendition of *Naukometriya*. For that, we relied on the Multidimensional Quality Metrics (MQM) (Lommel et al., 2014), that is a translation error classification split into 7 core error types: Terminology; Accuracy; Linguistic conventions; Style; Locale conventions; Audience appropriateness; Design and markup.

Our sample included every paragraph, split by sentences, containing one of keywords denoting the book’s core concepts: *наукометрия/scientometrics*, *незримый коллектив/invisible collective* (for our linguistic analysis, we use this term in the exact form it is presented in the original text; however, it has also a tradition to be translated as *невидимый колледж/invisible college* as in: (Price, 1966, pp. 336–337) that we acknowledge), and *информационный поток/information flow*. This way, we pinpoint critical places where an error could cause most detriment to the most significant ideas. In total, we analyzed 502 sentences, aiming to practically assess the translation’s effectiveness as a medium responsible for both general accuracy of the original conceptual domain and upkeep of authorial credibility.

Additionally, we performed accuracy checks to validate doubtful cases through relevant sources: a) *The Chicago Manual of Style* (2024) for stylistic recommendations; b) various Russian and American English dictionaries for dubiously translated lexical items (e.g. Kuznecov, 2000; Merriam-Webster, 2025); and c) the *Corpus of Contemporary American English* (COCA) (Davies, 2010) to verify natural language use.

3.2. Citation Analysis

To capture the global circulation of *Naukometriya*, we conducted a citation analysis using the Web of Science (WoS) Core Collection, as it remains the primary tool for reconstructing 'world science' during the Cold War. We manually identified and aggregated citation variants for both the 1969 Russian original and the 1971 FTD machine translation (*Measurement of Science*) to mitigate the issue of non-distinctive references.

Country affiliation data were primarily extracted from the Web of Science records. Where affiliation information was missing or incomplete, it was verified and complemented through manual consultation of external bibliographic databases.

To visualise the book citations (1969–2026), we applied fractional counting to author affiliations. Given the extended temporal scope of the dataset, spanning multiple geopolitical transformations, we introduced a controlled geopolitical harmonisation procedure which allows the comparability across time. It means that citations attributed to the former USSR were reassigned to Russia; Czechoslovakia was disaggregated into Czechia and Slovakia; and Yugoslavia was excluded from the geographical visualisation due to its marginal citation volume (single observation) and the absence of stable post-dissolution successor mapping within the dataset. These adjustments were made solely for the purpose of constructing consistent longitudinal visualisations and do not affect the underlying citation records.

3.3. Archival Research

We conducted archival research using the Eugene Garfield Papers held at the Science History Institute (Philadelphia, USA). The aim of this analysis was to reconstruct the historical conditions surrounding the absence of an authoritative English translation of *Naukometriya* and to identify institutional and interpersonal factors that may have influenced its publication trajectory.

The archive contains correspondence between Garfield and Nalimov spanning the period 1977–1997, whereas systematic archival material documenting later publication-related correspondence involving Zinaida Mulchenko is not present in the consulted collection.

This absence is not incidental. As we demonstrate elsewhere (Kislenko & Kulczycki, 2026), Mulchenko — co-author of *Naukometriya* and an active scientometrician in her own right — gradually disappeared from scientific discourse in the early 1970s, a trajectory consistent with the Matilda Effect: the systematic underrecognition of women's contributions to science. By the time Garfield and Nalimov began their correspondence in 1977, she had effectively vanished from the international exchange surrounding the book that bore her name. The present study does not reconstruct her role or the mechanisms of her erasure — that analysis is developed in a companion paper — but her absence from the archival record must be acknowledged as a structural feature of the source base, not a neutral given.

The correspondence between Garfield and Nalimov thus begins with their first documented contact following the Moscow Book Fair (1977) and ends with Nalimov's death in 1997. The corpus thus provides a continuous, longitudinal record of exchanges between the two scholars over two decades of Cold War-era scientific communication.

The materials were selected because ISI Press, affiliated with the Institute for Scientific Information (ISI), founded by Garfield served as a key English-language publisher of Nalimov's works during the 1980s. In total, four books by Nalimov were published by ISI Press, making this institutional setting a relevant context for evaluating whether *Naukometriya* was ever seriously considered for publication in an English-language revised edition.

The correspondence was analyzed as a qualitative archival dataset. We systematically examined letters for references to (1) publication plans for *Naukometriya*, (2) discussions of translation quality and revision needs, (3) dissemination strategies for Soviet scientometric works, and (4) institutional or political constraints affecting East-West scholarly publishing. The archival interpretation of these materials is developed primarily in the Discussion section, where they are triangulated with evidence from translation quality assessment and citation data.

4. Results

This section presents the empirical findings of the study derived from (1) the MQM analysis of the 1971 Systran translation of *Naukometriya* and (2) citation data from the Web of Science covering both the original Russian edition and its English translation. The results are organized into two subsections addressing translation quality and international scholarly visibility.

4.1. Quality Assessment of the Systran Version

The MQM assessment reveals substantial quality issues in the 1971 Systran translation. To contextualize these findings, we evaluated the translation using a seven-category MQM framework (Table 1), focusing on error distribution and severity.

To understand why Garfield and Nalimov were even considering producing another translation (Nalimov, 1982a), we assumed that there should be an issue with the existing translation done by Systran. As FTD employee Dale Bostad acknowledged, the mistakes while using MT are eventually inevitable. However, the scale of the problem is unknown. To grasp the worth of the existing version, we conducted the quality assessment of book translation via Multidimensional Quality Metrics with the help of seven categories seen in Table 1.

Overall, we concluded that around 77% of analyzed sentences contained at least one error, meaning less than a quarter of the sample was fully error-free. We also found out that 1-3 errors appeared in two-thirds of all sentences, 4-6 in 9% and one remarkable example had 7 mistakes.

The MQM error typology is also equipped with its own formulas for assessing translation quality in a quantitative manner. One of them involves calculating the text's weighted score. The procedure is done by assigning a numerical value to each error (in our case, minor errors were equal to 1 point, whereas major ones—to 5 points). Then, by summing the points

(rendering 2 409 for our text), dividing them by the overall word count (11 974), and multiplying by 100, we ended up with the score of 79,88%. That percentage places our score below the 90–95% threshold suggested by the MQM framework as the boundary of acceptable translation quality (MQM website, www.themqm.org, 2026), which would render the translation below the generally acceptable level.

Table 1. Number of errors split by Multidimensional Quality Metrics categories.

	Conceptual Domain		Authors' Credibility		Other (combined)
MQM Category	Terminology	Accuracy	Linguistic conventions	Style	Locale conventions; Audience appropriateness; Design & Mark up
Errors (N=812)	137	159	258	239	19
Share %	16.87%	19.58%	31.77%	29.43%	2.34%

Most errors (over 60%) related to Author's Credibility, rendering the translation unnatural, wooden, and wordy, thus diminishing credibility. Then, almost 40% constituted errors in Conceptual Domain, namely mistranslations of the original terms, proper names, and wording, which distort the conceptual domain. This gives us an idea of the scope of the errors. However, to better grasp their characteristics, we selected the most revealing set of examples.

Firstly, the conceptual domain is affected by issues with terminology (whereby established terms are distorted) and accuracy (concerning non-terminological mistranslations). When it comes to terminology, lackluster equivalents are evident already in the book title: *Наукометрия* (*Naukometriya/Scientometrics*), translated as *Measurement of science*. Seemingly, the discipline name of “scientometrics” have been popularized after Tibor Braun founded the journal *Scientometrics* in 1978. However, it would have emerged not long after Garfield and Nalimov met in 1977 and most likely should have been considered when re-translating *Naukometriya* arose in their discussions.

In current form the title clashes with the now-established discipline name, which, paradoxically, the book inspired. In fact, the MT title could hardly ever denote a proper scientific field, because it is too descriptive, treating the discipline simply as an activity of “measuring science.” “That would never fly in English”, as Garfield himself said about the term “science of science,” “What the hell does that mean, you know?” (Garfield, 2007a). One can only imagine what his opinion was on “measurement of science.”

On terminology, we should also mention that some terms are translated with double equivalents, appearing inconsistently throughout the text. For instance, *полустарение публикаций* is translated as *half-aging of publications* in some parts and then as *semiaging* in others. Similarly, one of our central terms, *информационный поток*, is usually translated as *information flow*, but there are 4 instances of *informational flow* in our sample, as well—both denoting one term in Russian.

The translation of another significant term, *naukovedenie*, actually merges the two aforementioned issues. First, just like *naukometriya*, the English equivalent *study of science* does not resemble a discipline name. Second, sometimes a regular phrase *изучение науки*, not denoting the scientific field, is also translated as *the study of science*. It may be difficult to tell when the actual discipline is being discussed and when it is simply the act of studying science. Although these inconsistencies seem minor, they appear in words that are important to the work's message. Inconsistency in translation engenders confusion about whether the authors have a single phenomenon in mind or multiple.

Poor accuracy is visible, for example, in the fragment “[незримые коллективы] явно недемократичны” ([invisible collectives] are *evidently undemocratic*) mistranslated as “[invisible collectives] are *evidently democratic*” (authors’ italics). Perhaps more perplexing yet are the sporadic omissions of entire phrases, even sentences. For instance, the sentence “Здесь действует иной механизм и нужна другая модель для его описания” gets as lost in translation as it can get—it is fully gone.

Secondly, authors’ credibility could be diminished in MT due to the translation’s unnaturalness and wordiness, caused by grammatical structures erroneously retained from Russian. For example, Russian reflexive verbs are translated as passive voice, even where active voice is possible. Overabundance of passive constructions is generally not preferred in English (*The Chicago Manual of Style*, 2024, p. 276) and it amplifies the verbosity. Sometimes, this overattachment to the original renders the translation extremely unnatural (for instance when “[наука] находилась на низком уровне” (science was at a low level) turns into “[the science] was found in a low level”) or just non-sensical, like “один официально не оформленный коллектив” (one officially unformalized collective), translated as “one officially not molded collective.”

Even misuse of articles, simple typos (e.g. “east” instead of “easy”: “it is east to compute the time of the semiaging [of publications]”), or misspellings (e.g. “Diana Crain” instead of “Crane”; wrong transliteration of ГИРЕДМЕТ (GIREDMET) as GUREDNET”) can reflect poorly on the authors’ professionalism and overall character (Johnson et al., 2017, p. 82). They also indicate that the text was never proofread by a specialist. Moreover, all these factors convolute the sentences, thereby increasing the cognitive load exerted by a reader in processing them (Sweller et al., 2005) in turn making the entire translation less attractive or accessible linguistically.

In accordance with Systran’s “information only” *skopos*, our analysis confirmed that the MT quality leaves much to be desired. It significantly alters the original, undermining the authors’ credibility as trustworthy researchers and distorting the integrity of their conceptual domain. Therefore, being aware of the lackluster translation, Garfield and Nalimov understandably considered supplying the Western reader with a proper, authorized adaptation, which, however, never materialized.

The MQM-based assessment shows substantial quality degradation in the 1971 Systran translation, suggesting that linguistic distortions may have affected the text’s usability and interpretability. However, translation quality alone does not fully capture the scholarly consequences of *Naukometriya*. To complement this analysis, we turn to citation data from Web of Science to examine its international visibility and reception.

4.2. Citations of *Naukometriya* and its English translation

Citation patterns provide a second empirical dimension of the analysis, capturing the international visibility of *Naukometriya* and its English translation. Web of Science data (April 2026) indicate that while the work has been cited irregularly across several decades, its citation trajectory remains limited and uneven, with minimal direct engagement by its most prominent Western interlocutors. The Russian original accumulated 328 citations between 1969 and 2025, whereas the 1971 English machine translation received 95 citations over the period 1971–2026. This asymmetry suggests that translation did not produce a straightforward amplification of visibility in Anglophone scholarship, but instead contributed to a fragmented citation landscape in which both versions circulated in partially disconnected scholarly networks.

Garfield attributes *Naukometriya*'s lack of influence solely to poor dissemination: "without access to the Internet and limited distribution in those days, it was rarely cited" (Garfield, 2009, p. 174). Interestingly, while the book was cited in English sources 97 times before 2009 (data from Web of Science), Garfield himself mentioned the work only four times throughout the decades: in 1972, in 1982, and then again in 2004 and 2007 (Garfield, 1972, 1982, 2004, 2007b).

The analysis of Web of Science citation data (Figure 1) reveals a significant bibliographic scattering of Nalimov and Mulchenko's work, which might be read a direct consequence of the lack of a standardized English translation. The original 1969 Russian edition exists in the scholarly circuit under dozens of different variants due to inconsistent transliterations of the author's name (e.g., Nalimov vs. Nalimow) and errors in the title.

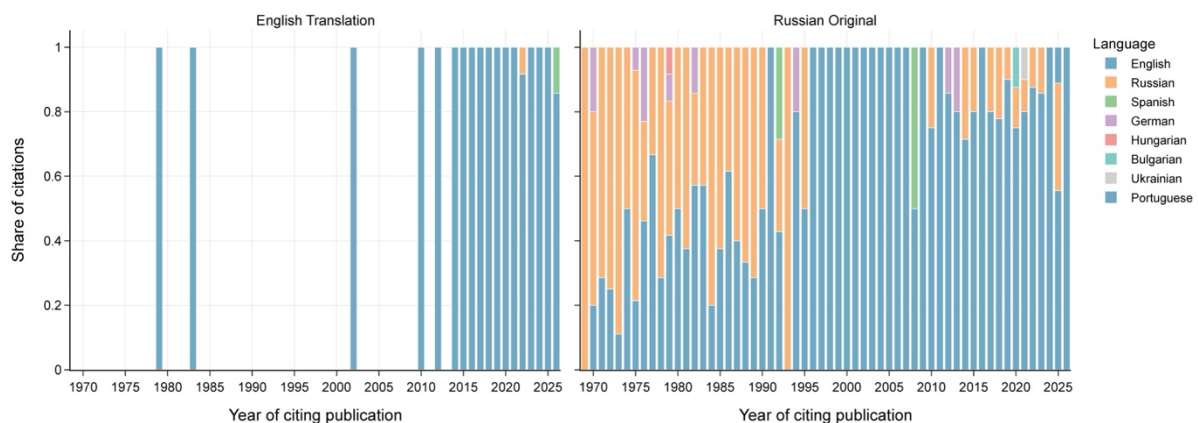


Figure 1. Citations of Russian original version and its English translation.

Importantly, the 1971 machine translation titled *Measurement of Science* not only received substantially fewer citations than the original but also further intensified the terminological chaos. Bibliographic data reveal that the work's impact was fragmented across numerous inconsistent citation variants, which effectively diminished the book's visibility in automated

indexing systems. As a result, this prevented the consolidation of its impact on the global development of scientometrics.

The geographical distribution of citing authors, visualized through fractional counting of affiliations (Figure 2), reveals a contrast between the reach of the 1969 Russian original and the 1971 English machine translation. The citations for the original edition are overwhelmingly clustered within the Soviet Union and Eastern Bloc countries. This indicates that while the work was foundational, its direct impact remained largely ‘geopolitically locked’ within the socialist sphere.

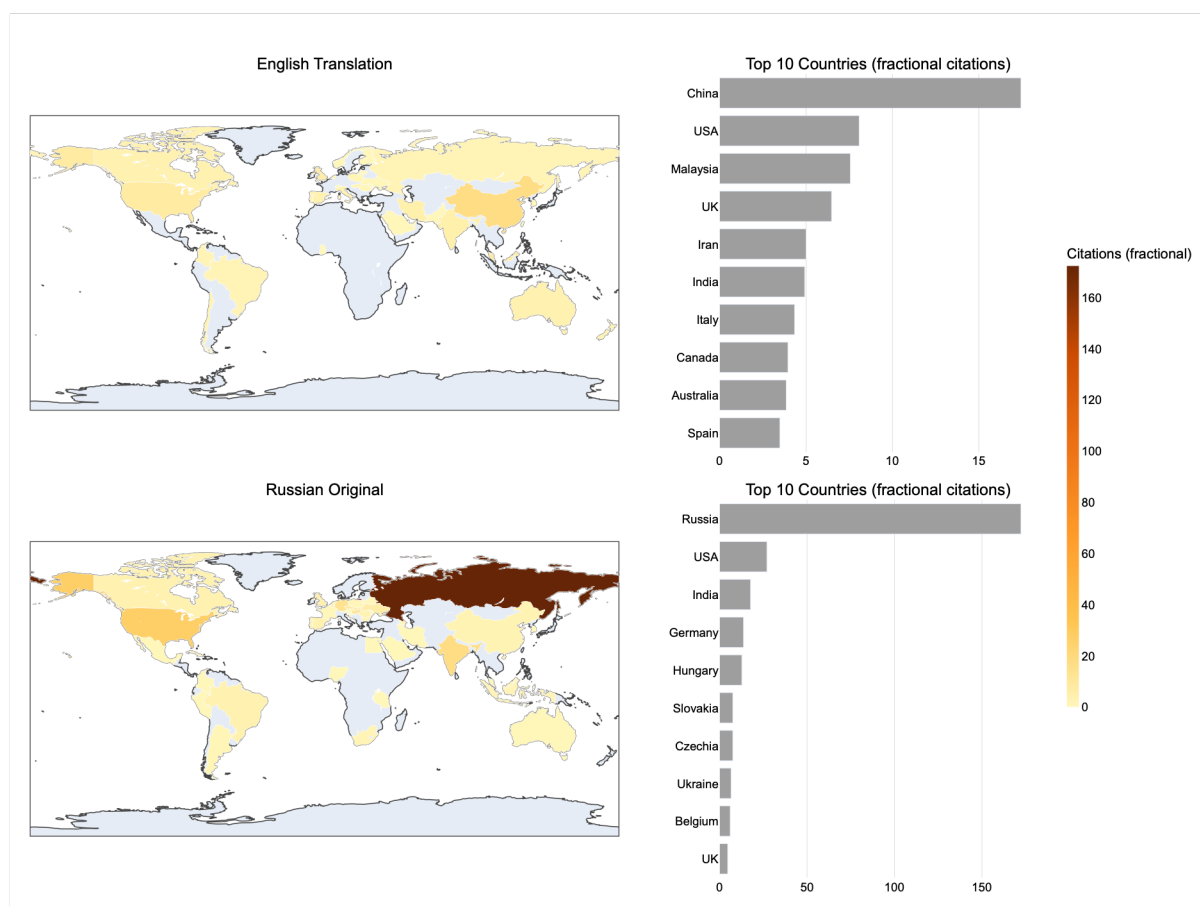


Figure 2. Geographical reach of *Naukometriya*’s citations

This isolation is evident despite the known indexing biases of the Web of Science (formerly SCI) during the 1970s and 1980s. Although the database failed to index a vast number of Eastern European journals where scientometric debates were held, the available data strikingly shows that while the Russian original accumulated a 328 citations between 1969 and 2025, these remained almost exclusively confined to Soviet and Socialist countries. Soviet Union dominates the distribution with over 172 fractional citations (FC), followed by USA (FC=27) and India (FC=17.6). This suggests that the linguistic barrier was so impenetrable that even the most influential works of the Soviet school of scientometrics could not cross into Western discourse without a proper translation. In contrast, the 95 citations for the 1971 English version show a shift and the Soviet/Russian dominance disappears entirely, replaced by China (FC=17.4), the USA (FC=8), and Malaysia (FC=7.6) as the primary country citing affiliations.

Consistent with the configurational design declared in the Methods, we do not isolate a causal effect of translation quality on citation impact. The MQM assessment establishes that the 1971 translation was substantially distorted. The citation analysis establishes that the book's international visibility remained limited and bibliographically fragmented. We treat these as mutually reinforcing conditions, jointly shaping reception alongside the political and editorial constraints reconstructed from the archival sources.

5. Discussion: Why Was *Naukometriya* Never Published by ISI Press?

This section integrates empirical findings from translation quality assessment and citation analysis with archival evidence from correspondence between Garfield and Nalimov. We synthesize three sets of evidence: textual distortion in the machine translation, asymmetric citation visibility, and archival correspondence to explain why a revised English edition of *Naukometriya* never materialized.

Among the most striking findings of our analysis is one that bears directly on the central question of this paper. Eugene Garfield — *Naukometriya*'s most prominent Western interlocutor, the publisher of four of Nalimov's later books, and the figure who described scientometrics as "the term [Nalimov] invented" (Garfield, 2001) — cited the book only four times in his entire career. In memoriam, Garfield reminisced that for him "it was a special privilege to be able to publish some of his books but in the end, it was never enough" (Garfield, 1997a). This pattern is incompatible with Garfield's own diagnosis of the book's limited impact, which he attributed to "without access to the Internet and limited distribution in those days, it was rarely cited" (Garfield, 2009, p. 174). Garfield had access. The explanation must lie elsewhere.

Institutional evidence further weakens the dissemination explanation. The Systran translation was deposited in the National Technical Information Service (NTIS) shortly after production, and from 1988 onward NTIS materials migrated to electronic and CD-ROM distribution name (Caponio & MacEoin, 1991). Distribution was therefore neither absent nor steeply restricted — at least not enough to explain a citation rate this low among scholars who actively cited *Naukometriya*'s closest interlocutors.

We propose, instead, a three-factor explanation: (1) Nalimov's authorial agenda, which favored extensive revision over republication; (2) ISI Press's commercial constraints during the relevant period; (3) the political and bureaucratic conditions of Cold War East–West publishing. We treat these as a configuration rather than a ranking: factor (1) made the project costly and difficult to undertake, factors (2) and (3) made it unattractive to underwrite. We discuss each in turn, then return in the final paragraph of this section to how they jointly explain the observed outcome.

Certainly, the distribution of *Naukometriya* was not truly unlimited at the time. Still, it likely was attainable to those who knew where to look for it, especially for scientific workers with access to well-stocked libraries. Therefore, unconvinced that restricted dissemination alone was to blame for the book's in consequence, we pursue possible alternative explanations.

In 20 years of their cooperation with the Soviet scientometrician, ISI Press published four translations of Nalimov's works in the United States: *In the Labyrinths of Language* (Nalimov, 1981b), *Faces of Science* (Nalimov, 1981a), *Realms of the Unconscious* (Nalimov, 1982c), and *Space, Time, and Life* (Nalimov, 1985). However, the one book that gave the discipline its name, the one arguably most in line with Garfield's own research interests, never reached the printing house. It follows that an official publication of *Naukometriya* through a bonafide scientific publishing house like ISI Press would popularize and validate its message. Nalimov himself put it plainly: "myself, being a scientist who constantly publishes his papers, prefer not to resort to unpublished reports" (Nalimov, 1981d).

Garfield and Nalimov established contact when they met officially for the first time at the inaugural Moscow Book Fair in September 1977 (Garfield, 1982)—though later Garfield reminisced that they had likely crossed paths already in the 1960s, when he lectured at VINITI (All-Union Institute for Scientific and Technical Information), where Nalimov was employed (Garfield, 1997b).

Their first connection via post happened shortly after the Fair, when Garfield asked Nalimov to pass a message to another Soviet author (Garfield, 1977) and then informed him about the delivery of a book he had requested (Nalimov, 1978). This tandem virtually summarizes the epistolary dynamic that eventually emerged between the two scientists. Seemingly, they both benefitted from this acquaintance—though in different ways. Garfield was Nalimov's usher into the world of Western, particularly American, science—providing books for research, publishing and promotional opportunities. Nalimov, meanwhile, was Garfield's on-the-ground reporter on any Soviet-related matters, supplying information on local science, reviewing Russian-language works that ISI Press was considering for translation, and aiding with sociocultural context.

In 1982, in response to an earlier in-person conversation with Garfield about general upcoming publication plans, Nalimov writes: "I have thought this question over and here is the result of my pondering: (...) If we consider the publication in the USA of my book *Scientometrics*, it will be necessary to provide it with many amendments" (Nalimov, 1982a). He remains skeptical and somewhat unenthusiastic, concluding that "in short, there is a lot of work here. It is difficult to gather under one umbrella everything that would make a new edition of the book desirable and legitimate. It will take me no less than 3 years" (Nalimov, 1982a). Yet, he does not immediately dismiss the idea, but actually provides notes on how exactly the work could be updated for the contemporary American reader.

Significantly, he uses the title "*Scientometrics*," not "*Measurement of Science*"—the variant used by the FTD. This suggests that he himself did not consider the descriptive name bestowed by Systran to be the most accurate. Crucially, by this point, Nalimov is well-aware of the fact that FTD's translation exists. Although the MT version is not explicitly discussed at any point, he includes the full English title, with the place and date of release, in a letter listing his most important publications (Nalimov, 1981c). It appears that since Nalimov knew about the pre-existing English translation, he must have regarded it as unsatisfactory enough to warrant a do-over if he was even entertaining the idea of publishing the work with ISI Press. As to why it never came to fruition, we believe there are potential personal, financial, and political reasons to blame.

5.1. Factor 1: Authorial agenda — Nalimov's preference for revision over republication

A first explanatory dimension concerns authorial priorities and shifting intellectual agendas. In the personal vein, by the 1980s Nalimov was fully committed to another topic: probabilistic models in transpersonal psychology, hence his disinterest in scientometrics. For one, he justifies the 3-year timeline for *Naukometriya* publication stating that he is “deeply engaged” in perfecting *In Search of Lost Meaning* (Nalimov, 1982a). Tellingly, none of Nalimov's publications with ISI Press up to that point were really concerned with scientometrics and it seems Nalimov enjoyed a substantial amount of free rein in terms of what would get published.

On top of that was Nalimov's sense of misalignment with American audiences: “I am quite aware of the fact that my books are too incomprehensible for the average reader” (Nalimov, 1986). This feeling of incomprehensibility visibly haunts his correspondence with Garfield, who on several occasions suggests promotional techniques to “‘popularize’ Vasiliy's somewhat technical descriptions of his philosophical works” (Garfield, 1991), stressing: “it is essential that you try to condense your work into an English pocket book that can be sold at the popular level” (Garfield, 1986). Nalimov is receptive to these ideas, noting the need for adapting his work to American tastes and competencies.

Moreover, in the many Soviet book reviews he sent to Garfield over the years he repeatedly points out their innate “Russian-ness”, ever baffling to American eyes. For instance, in 1982 he advises that a book by Gumilyov might be “of more interest for the Russian readers than for foreign ones, since both the problems it touches upon and the free style of exposition make it a very Russian book” (Nalimov, 1982b). Later, for Sergei Haitun's book *Scientometrics* (1983) he expresses concerns that “it will [be] undoubtedly difficult for the reader whose interest is scientometrics proper. This is especially true of the American reader that, to my mind, has less solid mathematical background than the Russian one” (Nalimov, 1983). It is probable that Nalimov's acute awareness of this extralinguistic barrier, coupled with his recent infatuation with transpersonal psychology, made retranslating seem not worth the time and effort.

5.2. Factor 2: Commercial constraints — ISI Press's publishing economics in the 1980s

A second structural factor concerns the economic constraints of scientific publishing within ISI Press. In the mid-1980s ISI Press apparently struggled financially (Garfield, 1984)—which would further justify putting *Naukometriya* on hold. Two months after Nalimov's October 1983 letter, the director of ISI Press responded that they “do not wish to proceed with any of these specific proposals at the present time. One reason is essentially mechanical, in the sense that the resources of ISI Press seem to be fully committed to other projects”, adding that they

“would like to sit back and see how the world's community of scholars reacts to the ‘intellectual feast’ (...) in the three books of yours we have published” (Day, 1983).

It follows, then, that any publication plans at the time would be quashed at least partially due to financing. That much can be gleaned from Garfield’s letter about Haitun’s *Scientometrics*: “Price did recommend it, but the Director of ISI Press felt that it would not have a large market. I, therefore, recommended that another publisher be approached. ISI Press cannot afford to subsidize yet another series of books” (Garfield, 1984). This finance-oriented mindset hardly manifests so bluntly across his correspondence with Nalimov, but it shows the dominant mood at ISI Press.

The continuation of the letter concerns the question of organizing a scientometric conference in Eastern Europe, to which Garfield reacts in a similar businessman fashion: “Where do you see the big pay off? We get a relatively small return for our investment of time and energy in the East European area. East Germany is the worst example. Do they even buy a printed Science Citation Index yet?” (Garfield, 1984). He continues: “Naturally, our own desires to promote general, peaceful, cooperation with the USSR and China means that we must make some investment of time. The pay off in China has been excellent. (...) They already spend more than the Russians” (Garfield, 1984). These exchanges suggest that ISI Press’ goals were not purely philanthropic: commercial considerations appear to have shaped the trajectory of *Naukometriya*’s fate.

5.3. Factor 3: Political infrastructure — Cold War mobility regimes and their consequences

A third dimension relates to Cold War political constraints and mobility regimes governing Soviet scholars. Across the letters, there is a visible push to get Nalimov across the sea for a promotional lecture tour. Garfield regularly insisted: “As I mentioned to you in Moscow, it is most important that you visit the USA in order to help promote the sales of your books” (Garfield, 1981); “several times I wrote to you about visiting me here in Philadelphia. This year, after the publication by ISI Press of three of your books, such a visit becomes even more desirable” (Garfield, 1983).

Nalimov himself also vehemently supported the venture: “my lecture tour would be the best means of improving the distribution of my books” (Nalimov, 1986). In travelling across the pond, he sees an opportunity to finally elucidate his ideas. The undertaking is not without obstacles, however, as obtaining the necessary permits from Soviet authorities was no easy process to navigate for Nalimov. Undoubtedly, his unfavorable political standing was not helpful—both him and his father had been formerly imprisoned at Kolyma GULAG for counterrevolutionary activities (Thompson, 1993, p. 343) and Nalimov did not hide his resentment later in life.

After years of anticipation with Soviet bureaucracy, the lecturing tour did eventually happen in 1988, soon after Nalimov received the 1987 Derek de Solla Price Medal. In a way, the awards were meant to symbolize East-West cooperation, as it was agreed they would be alternated each year: “one from the West and one from the East” (Garfield, 1986). This Western

recognition partially expedited the trip by presenting Soviet political authorities with clear reasons to let Nalimov travel: here is a Soviet scholar truly acknowledged by the West. Priorly, it would not have guaranteed a permit to leave, but the invitation came timely, during the period of active *perestroika* which proclaimed normalization of the relationship with the West.

The entire story unfolded over a period of more than 15 years, and its outcomes were restricted only to an American promotional campaign for Nalimov's other publications with ISI Press. In chronological terms, the (re-)making of *Naukometriya* for the Western world can be summarized as it follows in the timeline (fig.3):

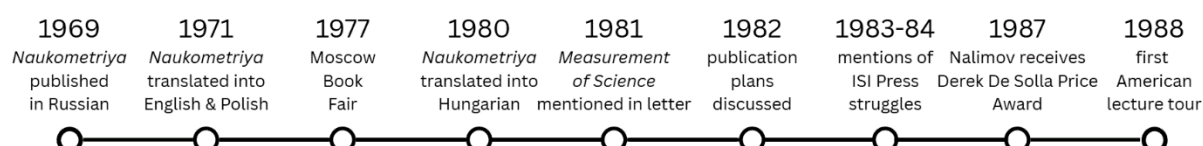


Figure 3. Timeline of major events in *Naukometriya* (Re-)Translation.

Upon first publication in Russian, it was quickly translated into English by means of machine translation and became almost immediately available at the NTIS depository for access by interested parties. Even though the MT quality was unsatisfactory, as confirmed by linguistic analysis, it took some time for Garfield and Nalimov after their first meeting in Moscow in 1977 to consider the possible options for retranslation. However, they were never realized and in the 1990s became completely abandoned as the focus switched to Nalimov's promotional lecture tours in the United States.

Returning to the configuration: the three factors did not merely co-occur, they reinforced one another. Nalimov's preference for substantive revision (factor 1) raised the cost of any ISI Press project at exactly the period when ISI Press was least able to absorb new costs (factor 2); meanwhile the bureaucratic friction around Soviet travel and exchange (factor 3) made the alternative — promotional tours of Nalimov's existing English-language titles — both more attractive and more achievable. Garfield's eventual recourse to the lecture-tour strategy is, on this reading, the rational outcome of the configuration, not a deviation from a planned republication.

6. Limitations

Three limitations of this study should be acknowledged. First, our citation analysis relies on Web of Science Core Collection data, which is known to under-cover Eastern European and Soviet-era journals. Citations to *Naukometriya* in venues outside WoS — particularly in Russian-language journals not indexed during the 1970s–1980s — are not represented in our counts. The figure of 328 citations for the original Russian edition should therefore be read as a lower bound on its scholarly reception within socialist scholarship.

Second, the MQM translation assessment was applied to a sample of 502 sentences containing the book's three core terms (*наукометрия* / *scientometrics*, *незримый коллектив* / *invisible collective*, *информационный поток* / *information flow*), rather than to the full text. This sampling strategy was designed to focus on conceptually consequential passages, but it does not produce a fully representative quality estimate for the book as a

whole. Comparing weighted MQM scores across full and sampled texts is a known methodological challenge.

Third, the archival reconstruction relies primarily on the Garfield–Nalimov correspondence held at the Science History Institute. This source base privileges two voices and renders other relevant actors silent. Most consequentially, Zinaida Mulchenko, *Naukometriya*'s co-author, is structurally absent from this correspondence, a pattern we examine separately (Kislenko & Kulczycki, 2026). Other potential perspectives (ISI Press editors, Soviet publishing intermediaries, translators) are likewise not represented. The configurational argument we develop should be read with this in mind: it accounts for what the surviving record permits us to see, not necessarily for everything that mattered.

7. Conclusion

This study demonstrates that the international reception of foundational scientometric texts cannot be understood solely through their intellectual content. The case of *Naukometriya* illustrates that the visibility and influence of scientific ideas are deeply contingent upon the linguistic, material, and political infrastructures that mediate their circulation. Our analysis shows that the 1971 Systran machine translation introduced substantial distortions, both linguistic and conceptual, that obscured key ideas such as the invisible collective and information flows — distortions that existed alongside, and plausibly reinforced, the book's limited intelligibility and the authors' diminished credibility among Western readers.

Beyond the technical evaluation of translation quality, our archival research reveals that the failure to produce a revised authoritative English edition was not merely a matter of oversight or neglect. Rather, it emerged from the interplay of three factors: Nalimov's insistence on extensive revisions that would effectively transform the book, the limited commercial interest of ISI Press in undertaking such a project, and broader political constraints on East–West scholarly collaboration during the Cold War. These findings highlight how the circulation of knowledge is never purely intellectual but is conditioned by authorial decisions, institutional priorities, and geopolitical realities.

The case of *Naukometriya* allows also for a broader theoretical reflection on the production and diffusion of scientific knowledge. First, it highlights the materiality of knowledge transmission: concepts do not travel in a vacuum, and their survival and uptake depend on infrastructures such as translation technologies, publishing systems, and international networks of scholarly communication. Second, it emphasizes the role of language as both a medium and a barrier: the transformation of *наукометрия* into “Measurement of Science” exemplifies how terminological instability may reshape the perceived scope and legitimacy of an emerging field — even when other structural factors remain equally decisive. Third, it emphasizes that disciplinary recognition and canon formation are as much social and infrastructural processes as they are intellectual achievements. Soviet contributions to scientometrics were systematically marginalized not because they lacked conceptual merit,

but because – among others – linguistic and institutional channels were ill-suited to transmit them effectively to Western audiences.

Third, the case has direct methodological implications for the historiography of scientometrics itself. Foundational texts originating outside the Anglophone academia may be systematically overshadowed by standard bibliometric tools because they circulate under multiple, inconsistent citation variants — a fragmentation that automated deduplication algorithms only partially correct. Researchers reconstructing the early history of scientometric ideas should treat citation counts of pre-1990 Soviet and Eastern European works as lower bounds and should anticipate that disambiguation requires manual aggregation of variant references (as we have done here).

Fourth, the case raises a generalizable question for *Scientometrics* readers working on the global circulation of scientific knowledge today. Machine translation in 2026 is incomparably more capable than the Systran of 1971, and many barriers to multilingual scholarly communication have been reduced. But the underlying logic of *skopos* — that a translation is built for a purpose, and re-purposing degrades fidelity — remains. As scientometric infrastructures themselves become multilingual (search interfaces, full-text indexing, citation context extraction), the question of which translations carry which authority, and on whose behalf, will only become more consequential.

Naukometriya was a book that named a field. It deserved better translation than it received. The lessons of its journey — across languages, across institutions, across the Iron Curtain — are lessons this field is still learning to apply to itself.

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