

Guardians of Knowledge: Byzantine Networks and the Transmission of Manuscripts to Renaissance Italy

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Abstract

At the end of the Middle Ages, the transmission of ancient Greek knowledge to Western Europe occurred amid political vulnerability, forcing scholars to reconsider the conditions for texts' survival. The circulation of Byzantine manuscripts (codices) was neither accidental nor a mere migration of ideas; it reflected deliberate choices, hierarchies, and protective mechanisms responding to the growing threat to Constantinople, culminating in its fall in 1453. This article examines how the transfer of Greek manuscripts between Constantinople and Italy was organized as a structured knowledge circulation process, relying on coordination of actors, resources, and activities amid uncertainty. Networks of Byzantine scholars, Italian humanists, patrons, and host institutions ensured selection, copying, transport, and preservation of codices. Attention to manuscript materiality, the routes they followed, and intermediaries reveals a highly organized system inseparable from intellectual evaluation. The study draws on the actor-resource-activity (ARA) model from the Nordic industrial marketing school to analyze interactions among actors, resources, and activities required to secure and transfer manuscripts. Through this lens, the Renaissance emerges as the product of collective efforts ensuring scholarly continuity, grounded in coordination, redundancy, and anticipation. Such perspective frames codices circulation as a logistical system, highlighting the intertwined roles of intellectual judgment and strategic organization, and invites reconsidering humanism as a history of decisions, mediation, and shared responsibility in preserving knowledge.

Keywords

Byzantine Manuscripts (Codices), Cultural Transmission, Intellectual Networks, Logistics, Renaissance, Resilience, Supply Chain, Text Preservation

1. Introduction

At the end of the Middle Ages, Western Europe stood on the cusp of an intellectual and cultural transformation whose magnitude escaped most contemporary actors. The circulation of ancient Greek knowledge was no longer a passive flow but relied on networks of cooperation and complex logistical strategies that have received little attention until now. Constantinople, heir to the Eastern Roman Empire, played a central role in the preservation, production, and transmission of philosophical, scientific, and literary texts. Its geopolitical and commercial position provided a critical foundation for scholarly continuity even as the Ottoman threat intensified. Byzantine scholars, patrons, and educational institutions grew increasingly aware of the fragility of this intellectual heritage, while Western humanists sought direct access to Greek sources to expand knowledge and reinforce European culture. Reflecting their growing awareness, this article underlines that the transmission of Greek manuscripts was a *deliberately organized process*, integrating intellectual, logistical, and institutional strategies, and shows how studying these networks illuminates both the Renaissance and the management of knowledge under political uncertainty. In this tense context, preservation and transmission of manuscripts constituted a civilizational project, sustaining an intellectual continuum across borders and crises (Geanakoplos, 1962; Monfasani, 2004). Attention to codices—manuscripts bound in book form—reveals the Renaissance not only as a cultural movement but as the result of deliberate strategies safeguarding and disseminating ancient knowledge, integrating social, political, and economic dimensions. For example, in 1423 the Sicilian humanist Giovanni Aurispa returned to Italy from Constantinople with roughly 238 Greek manuscripts, including works by Plato, Plotinus, and Proclus, one of the largest documented transfers of Greek texts to the Latin West (Stinger, 1977).

From the end of the 14th century onward, the Ottomans consolidated their control over the Balkans and Anatolia, gradually encircling Constantinople and reducing its resources and capacity for resistance. After the Ottoman defeat at Ankara in 1402, the empire entered a period of turmoil, yet the vulnerability of the capital remained evident, fostering scholarly exchanges aimed at preserving knowledge. Between 1450 and 1453, Mehmed II's campaigns reinforced the perception of Constantinople's imminent fall, while correspondence, chronicles, and travelers' accounts testify to a keen awareness of danger among Byzantine and Western elites (Necipoğlu, 2009). The circulation of Greek codices to Italy thus became a strategic concern, combining logistical considerations with the protection of the works. The selection and movement of manuscripts followed transmission patterns inherited from the Byzantine world, where survival depended on the choices of scholarly circles, conservation institutions, and the centrality or peripherality of dissemination centers (Martín, 2021). The evaluation of works, the selection of routes for exfiltrating them from Constantinople, and the establishment of institutional relays reveal a sophisticated management of intellectual heritage, in which Western humanists adapted their philological methods through direct

access to sources and comparison of manuscripts, thereby participating in the transition to the Renaissance (Runciman, 1969).

Codices, as fragile and unique objects, could be protected only through a coordinated network linking scholars, patrons, sailors, and intermediary institutions, where each actor fulfilled a specific role in the copying, transport, and storage of manuscripts. Attention to tangible resources, such as the reliability of transit infrastructure, was accompanied by recognition of intangible resources, particularly trust among network participants. This multidimensional perspective anticipates modern concepts of critical supply chain management, emphasizing that safeguarding intellectual heritage and managing flows efficiently were inseparable. The capacity for proactive planning, redundant routes, and continuous coordination among actors revealed a resilient system in which every decision influenced the survival of knowledge. In parallel, Western humanists adapted their methods to enhance the value and dissemination of texts. The complexity and sophistication of these networks transformed the transmission of manuscripts into a strategic collective project with cultural and economic implications, providing a unique example of the intersection between logistics and knowledge, where organization, innovation, and human responsibility formed the foundation of genuine civilizational continuity.

More specifically, the present cross-disciplinary exploration examines how the preservation and transmission of Greek manuscripts to Italy illustrate the construction of a resilient and coordinated circulation process and what lessons this historical experience offers for understanding organizational practices at the intersection of culture, economics, and management. The analysis is structured along three axes: first, an assessment of the historical and geopolitical context, highlighting the constraints and pressures shaping the survival of knowledge; second, an examination of the actors, resources, and activities sustaining the transfer supply chain; and finally, a reflection on contemporary implications, both regarding the resilience of flows and social and ethical responsibility, emphasizing the importance of an integrated view of these processes. The study adopts a cross-cutting approach, combining intellectual history, network analysis, and managerial reflection, to demonstrate that successful transmission relied not solely on preserving texts but on orchestrating a structured collective operation, whose lessons extend beyond the historical context to illuminate contemporary challenges in critical flow management and continuity of strategic resources.

2. Circulation of Manuscripts

European intellectual history cannot be understood solely through the works that have survived to this day, but also through the historical, social, and political conditions that enabled their transmission. Ancient knowledge never circulated mechanically. Surviving catalogues and inventories illustrate the scale of this circulation: by the mid-15th century, hundreds of Greek manuscripts had already reached Italian cities such as Florence, Venice, and Rome, often through the mediation of

Byzantine *émigré* scholars (Berschin, 1989). Its preservation, dissemination, and reinterpretation depended on institutions, scholarly practices, and deliberate human choices. Recent research on Byzantine thought has shown that the transmission of knowledge involves continuous processes of selection, reformulation, and articulation among different intellectual, scientific, philosophical, and theological frameworks (Katsiampoura & Spiliopoulos, 2023). At the end of the Middle Ages, this interdependence became particularly evident as Mediterranean geopolitical balances weakened and access to Greek sources became increasingly precarious. Intellectual continuity was no longer implicit and became a power struggle explicitly formulated by actors themselves. Byzantine and Western scholars faced an unprecedented situation in which the survival of ancient knowledge could no longer be assumed but had to be organized, defended, and carefully managed. This conjuncture profoundly transformed practices, intellectual hierarchies, and the very conception of the scholar's social role. Examining such moment reveals how a historical crisis can drive intellectual reconfiguration, highlighting the mechanisms through which Western Europe gradually recognized its responsibility toward classical heritage and the conditions of its transmission.

2.1. Printing and the Renaissance Revolution

Johannes Gutenberg's invention of movable type in the 1450s marked a decisive turning point in the history of knowledge transmission in Western Europe (Eisenstein, 2012). It enabled the mass production of books, drastically reducing the costs and time associated with handwritten copying, while ensuring broader and faster dissemination. Unlike manuscripts, which were unique and fragile, printed books fostered the development of expansive networks of reading and learning, previously confined to scholarly circles or ecclesiastical institutions. Printing went beyond mere textual reproduction, gradually introducing content standardization, encouraging the correction of transmission errors, and reinforcing the authority of texts regarded as "*canonical*" (Clegg, 2015). For humanists, accustomed to meticulous comparison of Greek and Latin manuscripts, printing presented both an opportunity and a challenge: it allowed the wider dissemination of texts recently acquired from Constantinople while simultaneously necessitating the establishment of precise criteria for editing and selecting works (Davies, 1996). Philological criticism thus evolved into a collective and public practice, extending the strategies used for manuscript preservation but with vastly multiplied impact. Printing inaugurated a new era in which the transmission of knowledge depended on the convergence of technical processes, editorial standards, and intellectual practices, capable of profoundly transforming European culture and laying the foundation for what can be termed the Renaissance revolution.

Concurrently, the rise of printing profoundly reshaped social and institutional dynamics. Urban workshops in Venice, Rome, and Florence became *hubs of collaboration* among typographers, humanists, and patrons, structuring a fully-fledged cultural economy centered on the production, distribution, and consump-

tion of books (Richardson, 1994). This technological innovation accelerated the circulation of scientific, philosophical, and literary ideas, reducing reliance on manuscripts, which remained rare and scattered. Nevertheless, manuscripts retained a vital role, particularly for Greek texts that were still little known or challenging to transcribe, circulating alongside printed books. The simultaneous examination of manuscript and printed flows highlights a pivotal moment in which technology and intellectual practices coexisted and complemented one another (Brockstieger & Schweitzer-Martin, 2023). Gutenberg's invention was thus not merely a technological breakthrough; it established new publishing standards, facilitated the widespread dissemination of humanist culture, and consolidated the Renaissance revolution in Europe, both intellectually and materially. This perspective prepares the ground for the analysis of Byzantine manuscripts, emphasizing that, despite the advent of printing, the survival and circulation of Greek texts remained critical. The fall of Constantinople in 1453 abruptly disrupted established networks, heightening the vulnerability of knowledge and transforming the transmission of intellectual heritage into a significant civilizational challenge. This technological revolution, therefore, is inseparable from cultural continuity and the collective responsibility borne by those entrusted with cultivating knowledge.

2.2. Constantinople Endurance

The capture of Constantinople by Mehmed II in May 1453 represents a pivotal moment in European intellectual history. The event ended the Byzantine Empire, the last institutional heir of Rome, and a political framework that had ensured for over a millennium the continuity of a remarkably stable Greek and Roman scholarly culture. The imperial capital functioned as the principal center for the preservation, teaching, and transmission of ancient and medieval knowledge, at a time when much of the heritage remained fragmentary or inaccessible in Western Europe since the fall of the Western Roman Empire (Runciman, 1969; Kaldellis, 2015; Harris, 2022). Imperial schools, ecclesiastical institutions, monastic scriptoria, and private libraries contributed to the active preservation of fundamental texts in philosophy, medicine, the exact sciences, and literature. The Patriarchal School of Constantinople, reorganized during the 14th century, remained one of the principal centers for the teaching of philosophy and rhetoric, where scholars copied and commented on classical authors, as evidenced by the pedagogical practices described in Gregory Palamas's philosophical writings, which illustrate the structured teaching of logic, natural philosophy, and ethical reasoning in late Byzantine intellectual culture (Penney & Christou, 2020). Works by Aristotle, Plato, Galen, and Ptolemy circulated in Greek versions often more reliable than the medieval Latin translations available in the West. The inscription of ancient heritage relied on a continuous scholarly tradition grounded in commentary, teaching, and rewriting. Historians emphasize that Constantinople operated not merely as a place of passive conservation but as a space for the production and interpretation

of knowledge (Greatrex, 2018), ensuring intellectual continuity between classical antiquity and the late Middle Ages.

From the late 14th century, Byzantine intellectual heritage circulated increasingly in the Latin West, alongside intensified scholarly exchanges between Eastern scholars and Italian humanists. Figures such as Manuel Chrysoloras were instrumental in systematically introducing the teaching of Ancient Greek, particularly in Florence, by enabling direct access to original texts (Monfasani, 2004). This development transformed Western intellectual practices. Humanists could now compare texts with their original language rather than relying solely on often inaccurate Latin translations. Direct access fostered new philological methods based on manuscript comparison, linguistic analysis, and textual criticism (Hankins, 1994). Academic research highlights that this dynamic extended far beyond isolated works and contributed to the gradual formation of a humanist culture structured by the authority of ancient authors (Geanakoplos, 1962). Constantinople thus remained a central scholarly reference point, both for mastering Greek and for accessing Byzantine interpretive traditions. The resulting equilibrium, however, rested on a fragile political situation, with knowledge circulation closely tied to the survival of imperial institutions.

The fall of Constantinople abruptly ended this configuration, turning gradual scholarly exchange into a situation of rupture. The disappearance of the city as an autonomous center for knowledge production prompted immediate awareness among contemporary scholars of the Greek heritage's vulnerability. Humanist accounts from the second half of the 15th century frequently liken the event to a major cultural disaster, comparable to upheavals in Late Antiquity (Philippides & Hanak, 2011). Greek manuscripts thus acquired heightened value as fragile objects and bearers of memory, reflecting broader humanist concerns for possession, preservation, and authenticity characteristic of the material culture of the Italian Renaissance (Findlen, 1998). Historians interpret this phase as a decisive acceleration in integrating Greek knowledge within Western intellectual structures (Hankins, 1994; Harris, 2022). The gradual arrival of Byzantine scholars and Greek manuscripts contributed to lasting transformations in universities and humanist circles, fostering a critical culture grounded in the direct study of ancient sources. The events of 1453 thus constitute not merely a political rupture but a historical catalyst emphasizing Western Europe's dependence on Greek heritage and scholars' responsibility in its transmission.

2.3. Strategic Pressures

On the eve of its fall, the threat to Constantinople heightened awareness among Byzantine and Western scholars. Humanist letters, treatises, and prefaces from the first half of the 15th century attest to growing anxiety about the potential loss of Greek works still unknown or imperfectly assimilated in the West (Aschenbrenner, 2019). In several letters written during the 1430s and 1440s, Francesco Filelfo and Cardinal Jean Bessarion conveyed a sense of urgency regarding the fate

of Greek intellectual heritage, reflecting broader humanist concern that Greek works might be lost without active transfer and preservation in Italy, as evidenced by Francesco Filelfo's extensive correspondence and the emphasis on manuscript circulation documented in recent scholarship (De Keyser, 2018). Concern extended beyond the physical loss of manuscripts to the disruption of interpretive traditions essential for understanding them. Humanists increasingly recognized that the survival of ancient knowledge required deliberate intellectual choices, involving the prioritization of transmitted texts (Black, 2001). This approach led to critical evaluation of the ancient corpus, identifying works foundational for moral philosophy, rhetoric, or the natural sciences, while others were considered secondary (Kristeller, 1945). The urgency of preservation gave these debates a forward-looking dimension, transforming knowledge assessment into a proactive act rather than a purely retrospective exercise. Grafton (1999) emphasizes that this marks a departure from medieval transmission practices, previously dominated by careful but uncritical copying, near-exclusive reliance on authorial or traditional authority, and preservation-centered transmission. Renaissance scholarly culture distinguished itself through reflexive awareness of criteria, reasoned hierarchization of texts, and explicit attention to their civilizational significance, making manuscript preservation an intellectual project.

Such awareness redefined the scholar's social role, now understood as responsible for European cultural continuity. Sources indicate that scholars increasingly perceived themselves as mediators between a threatened heritage and future generations, invoked as the moral horizon of intellectual activity (Brotton, 2006). Responsibility manifested through active participation in scholarly networks, manuscript circulation, epistolary exchanges, and critical debates structuring knowledge dissemination. Attention to informal coordination, mutual trust, and intellectual solidarity demonstrates recognition that ancient knowledge constituted a "*common*," whose preservation transcended individual initiatives (Fumaroli, 1988). Humanists collectively developed intellectual priorities, hierarchized texts, and ensured accessibility to scholarly circles, reflecting heightened reflexivity regarding their cultural mission and criteria of legitimacy (Blair, 2010). Preservation of knowledge thus became a collective and normative endeavor, where responsibility, collaboration, and scholarly vigilance were essential instruments of civilization continuity.

The impact of this reconfiguration extended rapidly beyond humanist circles to influence Western educational and cultural institutions. Universities, nascent academies, and princely courts no longer merely preserved inherited knowledge; they actively selected and disseminated it, aware that continuity of intellectual heritage underpinned political stability (Bailey, 2022). Ancient knowledge ceased to be solely an object of admiration, becoming a critical resource mobilized according to carefully considered criteria and strategic objectives. Burke (1969) emphasizes that awareness of the past was transformed into a tool for guidance and judgment. Humanists developed sensitivity to the intellectual qualities of texts, their relevance for teaching, and their dissemination potential, treating knowledge

not as inheritance but as capital to be preserved and organized. The threat to Constantinople in the mid-15th century catalyzed this vigilance, accelerating the structuring of scholarly networks responsible for transmitting knowledge. Humanism thus emerged as a collective project integrating expertise, planning, and moral responsibility, laying the foundation for a European culture grounded in critical reflection and awareness of the civilizational significance of the classical heritage (Bouwmsma, 1979; Grafton, 1999).

3. Structures of Circulation

The transmission of Greek codices in Western Europe involved a sophisticated network in which actors, resources, and activities intertwined to form a resilient logistical system. The actor-resource-activity (ARA) model, developed by the *Industrial Marketing & Purchasing* (IMP) group (Håkansson & Snehota, 1995), helps to capture the complex interactions underlying this operation (see **Table 1**). Success depended on the competence and coordination of actors, the availability and organization of resources, and the orchestration of activities adapted to contextual constraints. Applied to manuscript transfer, the ARA model highlights how scholars, patrons, sailors, and intermediary institutions secured and transported fragile texts; how parchments, codices, ships, and storage facilities constituted essential resources; and how planning, copying, and supervision structured activities that ensured the survival of the documents. Logistics emerges as a strategic factor on par with the intellectual value of the works, with every decision, relationship, or route choice contributing to the continuity of the heritage. Anticipating threats transformed the operation into a civilizational challenge, ensuring that the Byzantine intellectual legacy arrived intact and usable in Italy.

Table 1. Conceptual overview of the ARA model.

Dimensions	Definitions	Key characteristics
<i>Actors</i>	Actors are individuals, groups of individuals, departments, companies, or groups of companies that perform activities and/or control resources within a business network	<ul style="list-style-type: none"> Engage in business relationships with other actors Exercise direct or indirect control over resources Possess specific knowledge and experience of the network Depend on network support to influence outcomes
<i>Resources</i>	Resources are tangible and intangible means used by actors when performing activities within business relationships and networks	<ul style="list-style-type: none"> Exist as financial, technological, human, and time-related assets Are controlled directly by one or several actors, or indirectly through relationships Provide potential value through provision and realized value through use Are shaped and valued through interaction
<i>Activities</i>	Activities are actions performed by actors to create, develop, combine, or exchange resources within and across business relationships	<ul style="list-style-type: none"> Are interdependent and connected across actors Are performed jointly within and between firms Are linked through direct and indirect connections Coordinate resource use within the network

Source. The Author.

3.1. Actors

The transmission of Byzantine manuscripts to Italy relied on a network of actors with complementary skills and responsibilities, turning individual escape routes into a collective project of strategic significance. Byzantine scholars in exile, notably Manuel Chrysoloras and Giovanni Aurispa, ensured not only the preservation of texts but also their prioritization according to rarity, intellectual value, and physical condition. Another notable example is Cardinal Jean Bessarion, whose personal collection of more than 700 Greek and Latin manuscripts was later donated to Venice in 1468, forming the foundation of the Biblioteca Marciana (Reynolds, 2022). They organized copying when needed and oversaw packaging, minimizing risks associated with travel, conflict, or piracy, as shown by studies of Italian Renaissance scholarly networks (Wilson, 2017). Italian patrons provided essential organizational and financial support, covering travel, accommodations, port facilities, and temporary storage. Sailors and merchants, often absent from scholarly accounts, contributed critical practical expertise: their knowledge of routes, seasons, and maritime conditions ensured the safe transport of cargo in line with scholars' and patrons' instructions. Monasteries and intermediary libraries offered protection, preservation, and occasional copying, providing structural resilience against partial losses. These combined competencies created an integrated system in which knowledge, financial resources, and logistical practices converged to preserve a threatened intellectual heritage, particularly well-documented in the Venetian context (Piccione, 2021).

Recent research on the mobility of Greek manuscripts shows that circulation did not follow a linear flow but unfolded through a *network of trajectories, human mediation, and institutions*. Venice's Biblioteca Marciana offers a privileged vantage point to observe these dynamics, revealing the plurality of paths and diversity of actors (Losacco, 2023). The *Pellicier Project* provides unprecedented insight into these networks, documenting circulation practices and specific forms of cooperation (<https://bsr.ac.uk/greek-manuscripts-in-renaissance-venice-the-library-of-guillaume-pellicier-and-its-contribution-to-europes-intellectual-heritage-2022-2026/>, Accessed December 29, 2025). Trust among scribes, messengers, diplomats, and port intermediaries proved as crucial as tangible resources. Networks of human and institutional infrastructure absorbed transport risks, compensated for disruptions, and maintained the continuity of textual flows despite crises. Scholars, patrons, and intermediaries reduced risk and optimized circulation, giving the operation civic and civilizational significance. Sustained transmission of Greek knowledge thus relied on a dense, resilient network where the reliability and commitment of each actor determined the success of transfers.

3.2. Resources

The manuscript supply chain depended on *tangible resources* whose quality and organization directly influenced codices' survival and successful transfer to Italy. Texts on fragile parchment faced threats from humidity, light, and handling, re-

quiring specific packaging to prevent physical, chemical, or biological damage (Maniaci, 2022), and contemporary manuscript studies show that codices were often wrapped in cloth and stored in wooden chests to limit damage during maritime transport. Durable parchment, sturdy bindings, and appropriate containers—maintained document integrity over long distances. Merchant ships and equipment ensured safe passage across the Mediterranean, protecting sensitive cargo from winds, currents, and piracy (Bianchi & Skrekas, 2024). Port infrastructure and land-based relays—warehouses, patrons’ residences, temporary libraries—provided secure storage, monitoring, and, if necessary, copying before shipment to final destinations (Degni et al., 2018). Even minor details, from storage order to codices arrangement in crates, could determine survival. Mastery of these logistics shows that manuscript circulation constituted a comprehensive strategic operation, where planning, anticipation, and precise packaging and route choices guaranteed the preservation of an irreplaceable intellectual heritage.

Intangible resources were equally crucial. Scholars’ expertise guided prioritization of codices by rarity, intellectual value, and pedagogical potential (Degni et al., 2018). Some manuscripts required immediate copying; others benefited from reinforced packaging suited to climatic and maritime conditions (Maniaci, 2022). Loyalty and trust among scholars, patrons, scribes, and sailors were essential: any negligence could lead to irreversible loss. Diplomatic and relational networks provided secure access to reliable ports and relay stations, ensuring constant monitoring and temporary storage (Griffin, 2023). Knowledge of sea and land routes, seasonal patterns, and piracy risks enabled anticipation, safe planning, and adaptation. Coordination of tangible and intangible resources transformed each expedition into a deliberate, methodical undertaking, where competence, cooperation, and foresight ensured both codices’ survival and the lasting transmission of knowledge. Manuscript logistics thus formed an integrated network combining physical infrastructure and human capital to sustain the Byzantine intellectual legacy.

3.3. Activities

Activities formed the dynamic core of manuscript preservation and transmission. Their effectiveness depended on codices, scholarly expertise, physical protection, and the sequential orchestration of these elements. Each stage involved trade-offs between intellectual urgency, exposure to risk, and logistical feasibility. Actors determined which codices to transport, when, by which routes, and in what form. Decisions unfolded in an unstable environment shaped by political uncertainty, climatic hazards, and institutional discontinuity. Shipments could be delayed, fragmented, or expedited according to the texts’ importance and evolving threats. Concealing manuscripts within ordinary trade flows reduced vulnerability, particularly in piracy-prone ports (Leidwanger & Knappett, 2018). Partial or complete copying distributed risk across routes, ensuring survival despite potential losses. In some documented cases, multiple copies of the same work were pro-

duced and circulated through different channels, increasing the probability that at least one version would survive potential loss at sea or in transit, a practice attested in studies of medieval manuscript transmission that highlight how works transmitted in numerous copies and along diverse networks are more likely to endure (Fernández Riva, 2019). These practices demonstrate logistical intelligence rooted in anticipation, flexibility, and collective discipline, making manuscript transmission an adaptive process continuously adjusted to uncertainty and constraints (Degni et al., 2018; Griffin, 2023).

Giovanni Aurispa's activities in Constantinople in the early 1420s exemplify meticulous planning in the acquisition and repatriation of rare Greek texts for Italian patrons. He acted well beyond the role of a simple intermediary, overseeing the selection, assessment, and prioritization of codices according to their intellectual value, rarity, and physical condition. Correspondence from the period documents his careful scheduling of shipments, which was continuously adapted to political tensions, maritime conditions, and the risks of piracy or confiscation (Wilson, 2017). Some manuscripts were concealed within low-value merchant cargo, including textiles, dried goods, or transit merchandise, to reduce visibility during inspections. Indirect and fragmented routes were favored over direct travel between Constantinople and central Italy, passing through Chios, Candia, or Venice, where Latin merchant networks and humanist intermediaries provided secure storage and redistribution (Monfasani, 2004). Giovanni Aurispa's case underlines that sorting, copying, and routing were not isolated acts but constituted a coherent, adaptive chain of decisions. The process reflects both the strategic complexity of manuscript transmission and the interplay between intellectual judgment, logistical foresight, and collaborative networks necessary to safeguard Byzantine heritage.

Coordination and monitoring completed the network. Letters, messengers, and diplomatic channels synchronized departures, arrivals, and receipts (Bianchi & Skrekas, 2024). Libraries and monasteries offered secure storage, occasional copying, and controlled local access. Supervision was a continuous process of evaluation and adjustment, with priorities and routes modified in response to losses, delays, or geopolitical changes (Maniaci, 2022). Scholarly logistics extended beyond simple movement of objects, relying on precise governance that linked intellectual decisions and material constraints. Coordinated activation of these practices transformed limited resources into a resilient network capable of preserving and transmitting the intellectual essence of civilization, ensuring the survival of ancient knowledge in Western Europe (Degni et al., 2018; Griffin, 2023). Far from isolated events, these operations formed an integrated, adaptive process in which collective reflection, discipline, and cooperation were as essential as infrastructure and physical protection. **Table 2** summarizes the main actors, resources, and activities, highlighting their interaction and strategic role in codices' survival.

Table 2. Actors, resources, and activities in the transmission of Greek manuscripts.

Components	Examples	Contributions	Main references	
<i>Actors</i>	Giovanni Aurispa, Cardinal Jean Bessarion, Manuel Chrysoloras, Francesco Filelfo, Italian patrons, sailors, monastic and library relay institutions	Prioritize, supervise, transport, store, coordinate manuscript circulation; ensure continuity and resilience	De Keyser, 2018 Taylor, 2020 Losacco, 2023 Van Rooy, 2023	
<i>Resources</i>	<i>Tangible resources</i>	Codices, parchment, durable bindings, merchant ships, port and storage infrastructure	Protect, transport, and store manuscripts safely; ensure physical integrity over long distances	Degni et al., 2018 Maniaci, 2022 Bianchi & Skrekas, 2024
	<i>Intangible resources</i>	Scholarly expertise, trust networks, diplomatic relations	Enable planning, risk mitigation, coordination, secure access, and monitoring	Degni et al., 2018 Griffin, 2023
<i>Activities</i>	Sorting, prioritizing, packaging, copying, routing, monitoring, relaying	Safeguard manuscripts, maintain continuity, supervise transmission, adapt to environmental and geopolitical constraints	Leidwanger & Knappett, 2018 Maniaci, 2022 Griffin, 2023	

Source: The Author.

4. Operational Insights

The operation to safeguard and transfer Greek manuscripts illustrates logistics conceived as a living and adaptive system. Historical evidence—from Giovanni Aurispa’s shipment of hundreds of manuscripts to the creation of Cardinal Jean Bessarion’s library—underlines that these transfers were not isolated events but part of a broader and coordinated movement of texts across the Mediterranean. The codices, unique and fragile, traversed maritime and land routes exposed to multiple hazards, where each error could compromise intellectual and cultural continuity. Success depended on the precise orchestration of stakeholders, integrating expertise, anticipation, and continuous coordination. Managing material resources, human skills, and information simultaneously demonstrates that resilience relied not only on infrastructure robustness but also on the intelligence of flows and mutual trust among actors. The strategies employed show that operational continuity required a careful balance of prudence, flexibility, and innovation, where each planning decision, chosen route, and act of coordination directly influenced the survival of knowledge. Applied to contemporary supply chains, this historical example demonstrates that performance, security, and sustainability emerge through the integration of skills, flow visibility, and proactive risk management. Byzantine history thus transforms logistics into a civilizational instrument, showing that supply chain efficiency encompasses not only physical transport but also continuity, responsibility, and sustainability of strategic resources.

4.1. Modern Applications

The Byzantine operation to safeguard and transfer Greek manuscripts provides a unique framework for reflecting on contemporary supply chains. Protecting and circulating critical resources in uncertain environments requires a robust organizational structure, methodical risk anticipation, and inherent resilience. Potential disruptions—ship delays, communication breakdowns, or cargo seizures—could have threatened intellectual and cultural continuity, a major civilizational challenge for Western Europe. Academic literature defines resilience as the capacity to prepare for, respond to, and recover from unexpected events while maintaining essential operations (Ponomarov & Holcomb, 2009). Byzantine strategies, such as creating partial duplicates and using multiple relays, find parallels in modern practices like supplier diversification, support point segmentation, and alternative route planning to secure critical flows (Kamalahmadi & Parast, 2016; Hosseini Shekarabi et al., 2025). Redundant storage points and structural flexibility ensured both robustness and shock absorption, showing that proactive planning transforms a fragile system into a resilient network capable of sustaining critical functions on a civilizational scale.

Coordination among actors—scholars, patrons, sailors, and monastic intermediaries—was central to resilience, as alignment of roles and interdependence maintained the integrity of flows despite hazards and uncertainties. Contemporary supply chains replicate this logic through shared information systems, collaborative platforms, and communication standards to synchronize suppliers, carriers, and distributors. As Kim & Kim (2024) and Ma et al. (2024) note, fluid exchanges and inter-organizational trust improve visibility, agility, and responsiveness to disruptions. These principles accelerate responses to incidents and enable proactive risk mitigation, anticipating malfunctions before they occur. In high stakes supply chains, such as pharmaceuticals or essential military infrastructure, combining anticipation, redundancy, active coordination, and transparency remain fundamental. The Byzantine case demonstrates that resilience depends not only on material resources but also on the intelligent integration of skills and communication, offering a model applicable to all supply chains operating in extreme conditions.

4.2. Ethics and Foresight

Beyond operational lessons, the preservation of Byzantine manuscripts reveals a profound civilizational dimension of logistics. Transporting Greek texts to Italy is not simply a matter of securing documents; it shapes the emergence of the Renaissance and illustrates how complex supply chains can influence the cultural and scientific destiny of a society. Every decision—route selection, codices prioritization, relay redundancy, and copying—embodies collective responsibility, transforming material transfer into a civilizational project. This perspective aligns with research on social and ethical responsibility in supply chain management, where

integrating social and environmental objectives has become a fundamental principle of sustainability (Atkins & Caldwell, 2020; Paul, 2025). Byzantine history also demonstrates the moral commitment of participants, as scholars, patrons, and logistics professionals acted with awareness that their actions ensured the intellectual survival of humanist society. Ha-Brookshire (2017) emphasizes that logistics carries a *moral dimension*; the Byzantine case shows that every supply chain, whether transporting manuscripts or essential goods, constitutes an “architecture” of values and responsibility, where strategic vision combines with operational integrity to secure codices as commons.

Integrating ethical principles into supply chains requires anticipating future challenges and adapting to technological, network, and societal changes. Recent literature emphasizes that environmental, social, and governance (ESG) criteria are now central indicators of resilience and overall performance, affecting the ability to respond to disruptions while adhering to societal norms (Li & Liu, 2023; Zheng et al., 2024). Combining strategic vision, robust operations, and ethical governance strengthens organizational resilience and converts external constraints into opportunities for process optimization. Byzantine practices—multiplying relays, securing duplicates, and coordinating heterogeneous actors—demonstrate the importance of planned redundancy, transparent flows, and collective responsibility. The rescue of manuscripts illustrates that logistics transcends material management to become a vehicle for social and cultural values, where every decision carries civilizational weight. For supply chains managing strategic resources, Byzantine history shows that quality, integrity, and foresight determine not only operational performance but also the sustainability of societal values. Table 3 synthesizes the main findings, linking Byzantine logistical arrangements to contemporary principles of supply chain resilience and governance.

Table 3. Byzantine logistical principles and modern supply chain applications.

Logistical principles	Byzantine practices	Modern supply chain equivalents	Key managerial insights
<i>Resilience</i>	Multiple routes and relay networks	Alternative routing, multi-sourcing	Continuity depends on anticipating disruptions
<i>Redundancy</i>	Partial duplication of manuscripts	Safety stocks, data backup systems	Duplication protects critical resources
<i>Actor coordination</i>	Scholars, patrons, sailors, monastic relays	Collaborative platforms, integrated information systems	Trust and synchronization enhance resilience
<i>Flow visibility</i>	Human oversight and oral information exchange	Digital traceability, real-time dashboards	Visibility improves responsiveness and control
<i>Ethical responsibility</i>	Preservation of knowledge as a collective duty	ESG-driven supply chain governance	Logistics embodies civilizational values

Source: The Author.

5. Conclusion

The study of the transmission of Greek manuscripts to Italy, occurring in the context of the imminent fall of Constantinople, provides a distinctive analytical perspective by combining historical and logistical investigation. This multidimensional approach underscores that Europe's intellectual continuity during the Renaissance depended not solely on the survival of texts but also on the complex coordination of actors, resources, and activities within adaptive networks. Applying a methodology inspired by the ARA model demonstrates how strategic choices, alternative routes, and redundant relays reinforced system resilience amid multiple risks. The civilizational dimension also becomes evident: preserving knowledge extended beyond material operations to encompass cultural and moral responsibilities that link each logistical decision to the transmission of values, continuity of scholarship, and the sustainability of intellectual institutions. The analysis illustrates how historical scholarship can inform contemporary practice, highlighting the importance of flexibility, coordination, and transparency in supply chains. By integrating operational and ethical perspectives, it contributes to a more comprehensive understanding of the mechanisms of cultural transmission and their relevance for modern flow management, offering a conceptual model applicable beyond the specific historical context.

It should be emphasized, however, that the originality of this study does not reside in the identification of previously unknown historical facts, as the events, actors, and dynamics examined have long been the subject of extensive scholarship in the historiography of Byzantium and the Renaissance. Rather, the contribution lies in an innovative analytical framework that integrates historical insights with conceptual tools drawn from network analysis and logistics management. This approach allows the transfer of Greek manuscripts to be understood not merely as a cultural or philological phenomenon, but as an organizational process involving the coordinated mobilization of expertise, tangible and intangible resources, and the adaptive management of flows within a context of political disruption. Viewed in such light, scholars, patrons, and intermediaries emerge not only as “*transmitters of knowledge*,” but also as agents operating within a circulatory system whose efficacy depended upon coordination, redundancy, and mutual trust. In doing so, the analysis seeks to foster a constructive dialogue between two domains rarely engaged systematically, thereby illuminating enduring challenges related to the continuity of flows and the safeguarding of critical resources, and situating them within a genuinely interdisciplinary perspective.

However, several limitations temper the main findings. First, the focus on the 15th century and the transfer of Greek manuscripts constrains the generalizability of conclusions, as other periods or contexts employed different preservation and dissemination strategies—for instance, in imperial China, where woodblock and movable type printing from the 11th century onward allowed broader circulation with less reliance on handwritten copies. Second, the fragmentary or incomplete nature of sources may create an impression of systematic planning, whereas many

actions reflect contingency. Third, applying contemporary logistical models risks anachronism; although they illuminate operational dynamics and network resilience, they cannot fully replicate historical practices. Fourth, structural factors such as implicit power relations, institutional rivalries, or the circulation of ideas outside codices remain underexplored. Addressing these considerations requires careful interpretation and sustained dialogue between empirical evidence and theoretical reflection to extract lessons genuinely applicable to contemporary supply chains while acknowledging the interdependence of context, actors, and resources.

Drawing on these insights, several research avenues emerge. Expanding analysis to other periods and regions can compare transmission mechanisms, evaluate network resilience, and identify enduring principles or cultural specificities. Investigating the interplay of material resources, knowledge, and moral responsibility can reveal how coordination and collective commitment affect both the survival of sensitive goods and the continuity of cultural and intellectual traditions. Studying contemporary supply chains offers opportunities to examine the integration of sustainability, ethics, and transparency in the proactive management of strategic flows, demonstrating convergence between operational performance and social responsibility. These directions encourage interdisciplinary research linking history, logistics, and management to deepen understanding of the connections between cultural transmission, organizational resilience, and civilizational responsibility. More broadly, they invite reflection on how complex systems can safeguard fundamental values, positioning logistics not merely as a tool of efficiency but as a vector of civilization and sustainable innovation capable of informing the societal challenges of tomorrow.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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