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KNOWLEDGE, STRUCTURE, AND THE LIMITS OF INSTRUMENT CLASSIFICATION SYSTEMS: BHARATA MUNI AND HORNBOSTEL – SACHS RECONSIDERED AS DOCUMENTATION FRAMEWORKS

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ABSTRACT
Instrument classification systems have long shaped how musical instruments are organised, studied, and compared within organology and ethnomusicology. Among the most influential of these frameworks are the classifications articulated in the Natyashastra attributed to Bharata Muni and the comparative system developed by Erich von Hornbostel and Curt Sachs. While these systems are widely referenced and continue to inform scholarly discourse, they are often treated as comprehensive modes of documenting musical instruments. This paper argues that classification and documentation are not identical processes. Through a critical re-examination of Bharata Muni's functional and performance-oriented framework and the mechanism-based taxonomy of Hornbostel–Sachs, the study demonstrates that both systems organise instrument knowledge effectively, yet within clearly defined epistemic boundaries. Neither system, however, adequately accounts for the internal structural organisation of instruments, including construction processes, component interdependence, and craft-based decision-making. By foregrounding these limits, the paper proposes that classification systems should be understood as partial knowledge frameworks that require complementary documentation approaches when the aim is to understand musical instruments as structurally organised systems.
Key Words: *Instrument classification, organology, musical instrument documentation, Bharata Muni, Hornbostel–Sachs, ethnomusicology.*

1 Introduction: Classification and the Question of Instrument Knowledge

Musical instruments are among the most studied objects in music scholarship, yet the ways in which knowledge about instruments is produced and organised remain uneven. Classification systems have played a central role in this process, offering structured methods to categorise instruments, compare them across cultures, and place them within broader musical taxonomies. From ancient treatises to modern museum catalogues, classification has functioned as a foundational tool in organology.However, classification is often treated as synonymous with documentation. Instruments are grouped, named, and compared, and this classificatory knowledge is assumed to sufficiently represent what an instrument is. This assumption deserves closer scrutiny. Classification systems, by their very nature, prioritise certain kinds of information while excluding others. They are designed to answer specific questions: *What type of instrument is this? How does it produce sound? Where does it belong within a larger system?* They are less equipped to address questions such as *How is the instrument constructed? How do its parts interact structurally?* or *How does craft knowledge shape its sonic behaviour?*

This paper approaches instrument classification systems not as neutral or exhaustive representations, but as knowledge frameworks with defined epistemic scopes. Using the classifications attributed to Bharata Muni and Hornbostel–Sachs as case studies, the paper asks a focused question: What kinds of instrument knowledge do classification systems produce, and what kinds do they necessarily leave out? By addressing this question, the study aims to clarify the limits of classification and to argue for the need to distinguish classification from documentation in organological research.

Methodology

This study adopts a qualitative, analytical methodology grounded in comparative organology and epistemological analysis. Rather than treating classification systems as neutral technical tools, the paper examines them as knowledge frameworks that organise particular kinds of information about musical instruments. Primary textual sources the *Natyashastra* attributed to Bharata Muni and the Hornbostel–Sachs classification are analysed through close reading, with attention to their organising principles, conceptual priorities, and implicit assumptions about instruments. The comparison is conducted across defined analytical parameters, including sound-producing principle, relationship to performance, treatment of material structure, and visibility of constructional process. A brief illustrative example (tabla) is employed to demonstrate how classificatory knowledge operates in practice and where its limits become apparent. The study is interpretive rather than empirical in intent, aiming not to evaluate the effectiveness of classification systems, but to clarify their epistemic scope and implications for instrument documentation.

2. Instrument Classification as a Knowledge Framework

Classification is not merely a technical activity; it is a form of knowledge organisation. Any classification system is built upon assumptions about what features of an object matter most. In the case of musical instruments, these features may include sound-producing mechanisms, performance function, material composition, or cultural use. Once a system prioritises certain parameters, other aspects recede into the background. In organology, classification has historically served three major purposes. First, it enables comparison across cultures by providing shared categories. Second, it supports archiving and museum practice by offering stable taxonomic labels. Third, it aids pedagogy by simplifying complex diversity into manageable groups. These functions are both legitimate and necessary. Problems arise only when classification is asked to do more than it was designed to do.

A key limitation of classification systems is that they tend to operate at the level of *type* rather than *process*. Instruments are treated as finished objects rather than as outcomes of constructional sequences and material decisions. As a result, internal structural organisation how components relate to one another, how materials are tensioned or balanced, and how sound emerges from these relationships often remains undocumented. Recognising this limitation does not undermine classification; rather, it clarifies its epistemic boundaries.

3. Bharata Muni's Classification: Functional and Performative Knowledge

The instrument classification found in the *Natyashastra* is one of the earliest systematic frameworks for organising musical instruments. Attributed to Bharata Muni, this system categorises instruments into broad groups based on how sound is generated and how instruments function within performance. Commonly articulated categories include stringed instruments, covered or membranous instruments, hollow wind instruments, and solid or struck instruments.

What distinguishes this framework is its close relationship to performance practice. Instruments are not understood in isolation but in relation to bodily action, gesture, and musical function. The classificatory logic is deeply embedded within a performative worldview in which music, movement, and sound are interconnected. As such, Bharata Muni's system produces a form of knowledge that is functional and embodied. It tells us *how* instruments are used, *how* sound is activated, and *where* instruments belong within the broader domain of musical action.

At the same time, this framework offers limited insight into the internal structure of instruments. While it effectively differentiates instruments based on sound activation and usage, it does not document constructional processes or structural hierarchies within the instrument itself. The classification does not explain how membranes are tensioned, how materials are selected, or how subtle craft decisions affect sonic outcome. These aspects lie outside the epistemic focus of the system, which is oriented toward performance rather than fabrication.

4. Hornbostel–Sachs: Mechanism-Based and Comparative Knowledge

The Hornbostel–Sachs classification system, introduced in the early twentieth century, represents a different epistemic approach. Developed for comparative organology, it classifies instruments based on the primary mechanism by which sound is produced. Categories such as idiophones, membranophones, chordophones, and aerophones abstract instruments from their cultural contexts in order to enable systematic comparison across societies. This abstraction is the system's greatest strength. By focusing on sound-producing mechanisms, Hornbostel–Sachs provides a universal framework applicable to instruments from diverse traditions. It has proven invaluable for museum cataloguing, archival organisation, and cross-cultural research. The system allows scholars to identify structural similarities between instruments that may otherwise appear unrelated.

However, this same abstraction also introduces limitations. By prioritising sound-producing principles, the system largely ignores constructional variation and craft logic. Instruments with radically different internal structures may be grouped together because they share a basic mechanism. The classification does not capture how materials are assembled, how components interact, or how artisans negotiate structural constraints. As a result, Hornbostel–Sachs produces a form of knowledge that is comparative and typological, but not process-oriented.

5. Comparative Analysis: What Classification Systems Know and What They Do Not

When examined side by side, the classification systems of Bharata Muni and Hornbostel–Sachs reveal complementary strengths and shared limitations. Bharata Muni's framework excels at situating instruments within performance and embodied musical action, while Hornbostel–Sachs excels at enabling cross-cultural comparison through abstraction. Each system organises instrument knowledge effectively within its own epistemic design.

Yet both systems operate primarily at the level of categorisation rather than structural documentation. Neither is designed to explain how an instrument is made, how its parts are hierarchically organised, or how sound emerges from the interaction of

materials and construction techniques. Craft knowledge—often transmitted orally and through practice—remains largely invisible within both frameworks.

This observation is not a critique of failure but a recognition of scope. Classification systems answer specific questions, and questions about constructional logic lie beyond their intended reach. Problems arise only when classification is assumed to be sufficient for understanding instruments in their entirety. Recognising what classification systems do *not* know is therefore as important as acknowledging what they do.

A brief illustration may clarify this limitation. The tabla, for instance, would be classified in Bharata Muni's framework as an *avanaddha* (covered with membrane) instrument, situating it within a performative and functional category defined by membrane-based sound production. Within the Hornbostel–Sachs system, the tabla is identified as a membranophone, further specified by the use of a struck membrane. Both classifications accurately describe how sound is produced and enable comparison with other instruments. However, neither framework documents the internal structural organisation of the instrument, such as the differentiated construction of the right- and left-hand drums, the role of the central loading in shaping pitch and timbre, or the sequential processes through which materials are assembled and tensioned. These structural and constructional aspects, while central to the instrument's sonic behaviour, remain outside the scope of classificatory knowledge.

6. Implications for Instrument Documentation

Distinguishing classification from documentation has important implications for organology and ethnomusicology. Documentation, unlike classification, requires attention to process, structure, and material relationships. It involves tracing how instruments come into being, how components interact, and how craft decisions shape sonic outcomes.

This does not mean abandoning classification systems. On the contrary, classification remains an essential entry point for organising instrument knowledge. What is needed is a complementary approach that addresses structural organisation and constructional logic alongside taxonomic categorisation. Such an approach would allow scholars to document instruments not only as members of categories, but as dynamically organised systems shaped by materials, techniques, and human decision-making.

By recognising the epistemic limits of classification systems, researchers can avoid overextending their explanatory power and instead integrate them within broader documentation frameworks. This shift encourages a more nuanced understanding of musical instruments as both cultural artefacts and structurally organised sound-producing systems.

7. Conclusion

This paper has argued that instrument classification systems should be understood as partial knowledge frameworks rather than exhaustive models of documentation. Through a re-examination of the classificatory systems attributed to Bharata Muni and Hornbostel–Sachs, the study has shown that both frameworks organise instrument knowledge effectively within their respective epistemic priorities, while leaving important aspects of structural organisation and construction undocumented.

Recognising these limits does not diminish the value of classification. Instead, it clarifies its role within organological research and highlights the need for complementary documentation approaches that attend to structure, process, and craft knowledge. By separating classification from documentation, scholars can develop richer and more precise accounts of musical instruments accounts that acknowledge both their cultural functions and their internal structural logic.

Recognising the epistemic scope of instrument classification systems invites a shift in how musical instruments are documented within organology. If classification organises instruments at the level of type and sound-producing principle, then a complementary mode of inquiry is required to account for their internal structural organisation, constructional processes, and material interdependencies. Such an approach would not replace classificatory systems, but extend them by attending to the architectonic relationships through which instruments are assembled, stabilised, and made sonically functional. Clarifying the limits of classification, therefore, does not diminish its value; rather, it opens the space for structural and process-oriented methodologies that document instruments as organised systems rather than as taxonomic entries alone.

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