Music as an Application (MaaA): A Framework for Sociopsychological Systems Through Music

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Abstract

This paper introduces **Music as an Application (MaaA)** as a framework for understanding music not only as entertainment or artistic expression, but as a functional sociopsychological system capable of encoding, transmitting, and analyzing human values, emotional states, identity formation, group belonging, and cultural behavior. The framework builds on the idea that music operates as one of the most distributed and psychologically active forms of cultural data in society. Through rhythm, acoustics, lyrical content, genre conventions, performance style, and social adoption patterns, music carries information about how individuals and communities experience the world.

MaaA proposes that music can be treated as an applied layer within psychology, sociology, cultural analytics, behavioral modeling, and emerging AI systems. Rather than viewing songs merely as creative outputs, this paper positions musical works as structured containers of emotional, cultural, and behavioral information. These containers can be analyzed computationally to infer values, emotional tendencies, group identities, cultural narratives, and social dynamics.

The paper draws from Evolutionary Psychological Structures (EPS), a framework that describes human behavior as emerging from foundational psychological structures such as belonging, identity, and power. Within MaaA, music functions as an interface between these psychological structures and cultural systems. Music activates sensation, organizes emotional meaning, reinforces social identity, and enables the mapping of sociocultural patterns across groups. The result is a framework for music-based sociopsychological systems: systems that use music as input, interface, signal, and application.

The paper concludes by outlining the foundational components of a Music Culture Model, including audio feature extraction, lyric analysis, sentiment interpretation, cultural value prediction, clustering, and predictive modeling. These components establish a pathway for building practical tools that can analyze music as cultural data and apply those insights across commercial, psychological, educational, therapeutic, and social domains.

1 Introduction

Music has historically been treated as a form of entertainment, expression, ritual, memory, commerce, and cultural preservation. It has been present in human life across civilizations, serving as a medium through which people celebrate, mourn, worship, resist, remember, socialize, and define themselves. Yet despite its centrality to human experience, music is still largely commercialized as an entertainment product. The dominant modern industries surrounding music—streaming, publishing, live performance, licensing, radio, synchronization, and social media promotion—primarily monetize attention, access, performance, and intellectual property.

This view is commercially valid, but incomplete.

Music does more than entertain. It shapes how people feel, how they remember, how they affiliate, how they signal identity, how they form communities, and how they interpret their place in society. A song can represent a generation, a movement, a region, a social class, a political moment, a spiritual identity, or a shared emotional condition. Music is one of the few human artifacts that can simultaneously carry emotional, cultural, linguistic, historical, social, and behavioral information. This claim aligns with ethnomusicology's long-standing view that music cannot be separated from the cultural context in which people create, perform, interpret, and use it (Merriam, 1964).

Music as an Application (MaaA) begins from this expanded understanding. It proposes that music can be used as a practical tool across multiple domains because music is already functioning as a psychological and cultural technology. MaaA does not reduce music to data. Instead, it argues that music is a structured human signal: a medium through which values, emotions, memories, beliefs, identities, and social dynamics are encoded and transmitted.

In this framework, music becomes an application layer for sociopsychological systems. It can be used to understand communities, model emotional states, map cultural identity, assess shifts in social sentiment, design experiences, improve mental health interventions, inform brand alignment, and develop new forms of cultural intelligence.

The central claim of this paper is that music can be operationalized beyond entertainment. It can become a tool for sociopsychological analysis and system design.

2 From Music Product to Music Application

2.1 Music as an Entertainment Product

The conventional music industry treats music as a product or service. In this model, music is created by artists, distributed by platforms, monetized through consumption, and promoted through visibility. Its value is measured through streams, sales, radio play, sync placements, concert attendance, social engagement, and intellectual property revenue.

This model has produced a powerful global industry. Music entertains billions of people, supports cultural movements, creates economic value, and enables artists to build careers. It also provides emotional connection, memory formation, collective experience, and personal enjoyment.

However, the entertainment model captures only one dimension of music's utility. It answers the question: *How can music be consumed?* It does not fully answer: *What does music do inside human beings and societies?*

2.2 Music as a Cultural Component

Music is also a cultural component. It stores and expresses collective meaning. A genre can carry the history of a people. A rhythm can signal belonging. A lyrical theme can reflect social frustration, aspiration, spirituality, rebellion, romance, trauma, pride, or survival. Musical taste often becomes a marker of group identity, generational membership, emotional orientation, or social positioning.

As a cultural component, music performs several functions:

- It preserves memory and oral tradition.
- It expresses values, norms, and social expectations.
- It reinforces group belonging.
- It enables identity formation.
- It gives emotional language to experiences that may be difficult to express directly.
- It influences social movements and political consciousness.
- It allows communities to transmit meaning across time.

Music therefore behaves like a cultural archive and an active social force. It is not merely a reflection of culture; it also participates in the construction of culture.

2.3 Music as an Application

MaaA extends the entertainment and cultural views by proposing a third layer: music as application.

An application is a tool designed to perform a function. In computing, an application uses input, processes information, and produces an output that serves a user or system. MaaA applies this logic to music. Music receives human experience as input, encodes that experience through sound and language, and produces emotional, social, psychological, and cultural outputs.

In this sense, music can function as:

- an emotional regulation tool;
- a cultural mapping tool;
- a psychological profiling signal;

- a social identity interface;
- a behavioral influence mechanism;
- a population sentiment indicator;
- a data source for cultural intelligence;
- a design layer for human-centered systems.

MaaA does not mean that music becomes software in the narrow technical sense. Rather, it means that music can be applied with the same intentionality as software: to produce outcomes, process signals, organize experience, and solve problems.

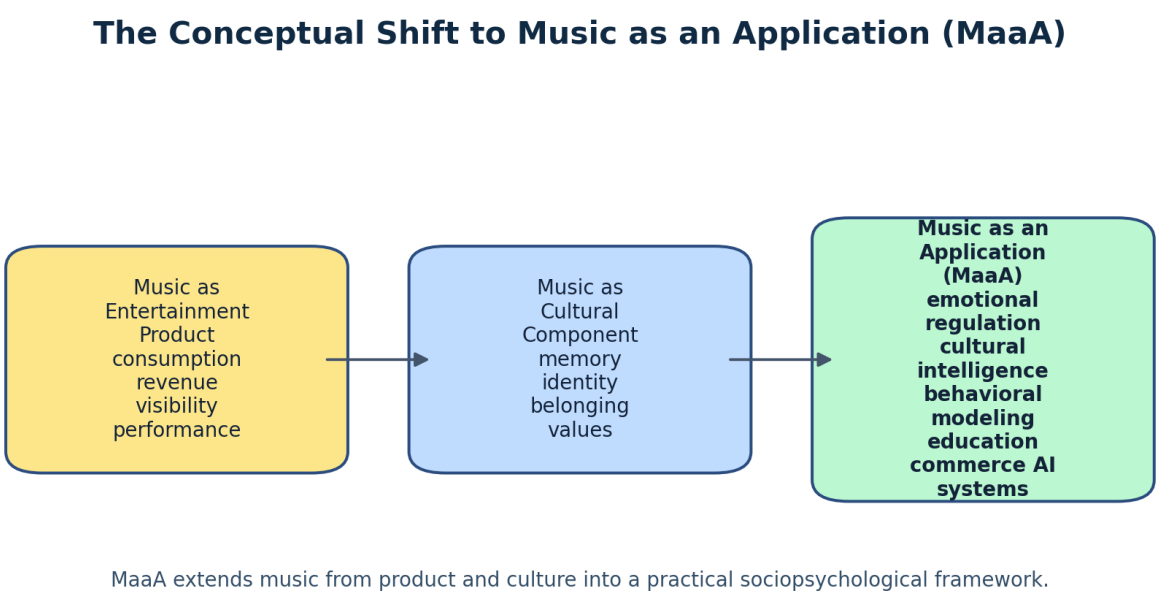

Figure 1: The conceptual shift from music as an entertainment product, to music as a cultural component, to Music as an Application (MaaA). The figure illustrates how MaaA extends music beyond consumption and artistic expression into a practical framework for psychology, sociology, behavioral modeling, commerce, education, and AI systems.

3 The Sociopsychological Basis of MaaA

3.1 Human Behavior as Structured Experience

Human behavior does not arise in isolation. It emerges from the interaction of biology, memory, environment, culture, social learning, identity, emotion, and value systems. People act based not

only on rational calculation, but on felt meaning. They pursue belonging, protect identity, respond to power, seek pleasure, avoid pain, preserve status, maintain relationships, and interpret the world through inherited and learned psychological structures.

MaaA requires a theory of why music is able to influence these processes. The answer lies in music's ability to enter the human system at the level of sensation.

Music is heard, but it is also felt. Rhythm affects bodily timing. Melody affects emotional expectation. Harmony creates tension and release. Bass frequencies can produce force and intensity. Lyrics attach meaning to sensation. Genre adds social context. Repetition builds familiarity. Performance style conveys identity and intention. Together, these elements create an experiential state.

This is why music can alter mood, trigger memory, increase social cohesion, intensify group identity, and become associated with major life events. Music does not merely communicate information; it organizes the listener's state of being. Research in music neuroscience supports the idea that music engages reward, anticipation, emotion, and auditory-processing systems, helping explain why music can become psychologically powerful rather than merely decorative (Zatorre & Salimpoor, 2013; Salimpoor et al., 2011).

3.2 Evolutionary Psychological Structures

The MaaA framework builds on **Evolutionary Psychological Structures (EPS)**, which can be understood as foundational psychological systems through which humans process the conditions of life. EPS describes behavior as emerging from deep structures that evolved to help human beings survive, reproduce, cooperate, compete, and form societies.

Within this framework, three primary psychological structures are especially important:

Belonging

Belonging refers to the need to connect with others and become part of a group. Human beings are social organisms. Across evolutionary time, group membership supported survival through protection, cooperation, shared resources, and social learning. In modern society, belonging appears in friendship, family, fandom, nationality, religion, community, ethnicity, subculture, and institutional membership.

Music is one of the most powerful tools for belonging. Shared songs create shared emotional space. Studies on musical synchronization and social bonding suggest that coordinated musical activity can support affiliation, cooperation, and self-other connection (Tarr et al., 2014). Concerts, chants, anthems, genres, and playlists allow people to feel part of something beyond themselves. Musical preference can become a signal of membership: who one is with, where one comes from, what one values, and which emotional world one inhabits.

Identity

Identity refers to the sense of self and the meaning of one's place within society. It includes personal history, values, affiliations, aspirations, roles, and social recognition. Identity helps individuals understand who they are and how they relate to others.

Music contributes to identity by giving form to internal experience. This connects with social identity theory, which argues that people derive part of their self-concept from group membership, and with research suggesting that musical taste can operate as a social badge of identity and in-group recognition (Tajfel & Turner, 1979; Lonsdale, 2019). People often use music to define themselves, narrate their lives, express taste, signal personality, and connect with communities that mirror their sense of self. Genres can become identity systems. Artists can become symbolic representatives of a worldview. Songs can serve as personal anchors for memory and self-understanding.

Power

Power refers to the capacity to influence one's environment, affect outcomes, secure resources, and shape social relations. Power can appear as dominance, agency, leadership, status, resistance, ambition, economic control, political action, or cultural influence.

Music expresses power through rhythm, intensity, lyrical themes, performance posture, volume, bass, repetition, and collective adoption. Protest songs, national anthems, battle chants, drill music, revolutionary music, and aspirational anthems all show how music can encode power dynamics. Music can affirm authority, challenge authority, mobilize groups, or provide psychological agency to individuals who feel socially constrained.

3.3 Values and Pleasures

EPS can be further understood through the relationship between values and pleasures.

Values are the standards, beliefs, principles, and priorities that individuals and societies consider important. They define what is desirable, honorable, meaningful, sacred, shameful, aspirational, or unacceptable.

Pleasures are the emotional and psychological rewards that reinforce behavior aligned with those values. When people act in ways that support belonging, identity, power, security, love, achievement, freedom, faith, or status, emotional reinforcement encourages repetition and attachment.

Music connects values and pleasures. It can encode a value system and convert it into sensation. A song about loyalty can make belonging pleasurable. A song about ambition can make power feel desirable. A song about self-expression can strengthen identity. A spiritual song can turn faith into emotional experience. A protest song can transform injustice into collective agency.

This is one of the central mechanisms of MaaA: music translates values into sensations and sensations back into values.

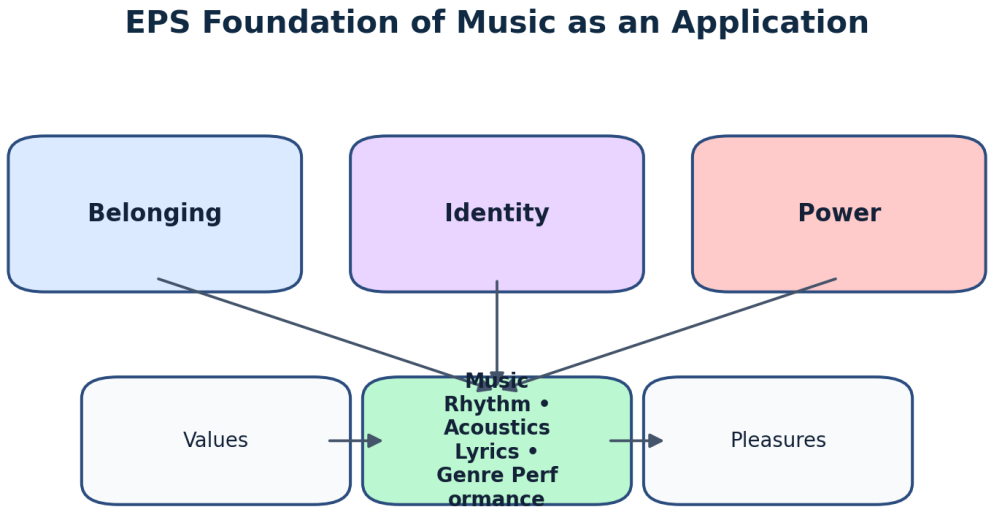

Figure 2: Evolutionary Psychological Structures (EPS) as the psychological foundation of Music as an Application. The figure shows belonging, identity, and power as core psychological structures, each linked to values and pleasures, with music acting as a functional medium that activates, expresses, and reinforces these structures through rhythm, acoustics, lyrics, genre, and performance.

4 Music as Sociopsychological Data

4.1 Why Music Contains Psychological Information

Music contains psychological information because it is created from human experience and received through human emotion. Artists compose from personal, social, historical, and cultural conditions. Audiences respond because the music resonates with internal states, group experiences, or desired identities.

A song can contain multiple layers of information:

- **Audio features:** tempo, rhythm, key, timbre, spectral energy, dynamics, repetition, melody, harmony, bass, and acoustic texture.
- **Lyrical features:** sentiment, themes, metaphors, pronouns, emotional language, moral language, identity markers, conflict, aspiration, memory, and narrative structure.
- **Cultural features:** genre, region, language, historical moment, social movement, religious context, class association, fashion, dance, and platform of distribution.
- **Behavioral features:** audience adoption, sharing patterns, playlist placement, dance trends, concert participation, fan communities, comments, and remix culture.
- **Commercial features:** streaming behavior, licensing use, brand alignment, market segmentation, and audience retention.

These layers make music a rich source of sociopsychological data. It is not only what people listen to that matters, but why they listen, when they listen, how they use the music, what communities form around it, and what values the music reinforces.

4.2 Music as Emotional Archive

Music functions as an emotional archive. Individuals often attach songs to specific memories, relationships, places, periods of life, and emotional transitions. Communities also attach music to collective events, rituals, struggles, celebrations, and identities.

Unlike ordinary text, music stores emotion in embodied form. A lyric can state a feeling, but rhythm, melody, and harmony can make the listener experience that feeling. This makes music uniquely valuable for understanding human behavior because it captures not only what people say, but what they feel.

4.3 Music as Cultural Signal

A cultural signal is an observable expression that reveals something about the values, identity, norms, or emotional state of a group. Music is one of the strongest cultural signals because it

spreads widely and is voluntarily adopted. People choose music that reflects or shapes who they are.

When a musical style becomes popular within a group, it may indicate broader patterns of emotional need, identity formation, social aspiration, frustration, belonging, or resistance. For example, changes in dominant lyrical themes across time may reflect changing social pressures. Shifts in tempo or sonic intensity may reflect changing emotional climates. The rise of particular genres may indicate new identity formations or cultural tensions.

MaaA treats these musical signals as analyzable indicators of sociopsychological systems.

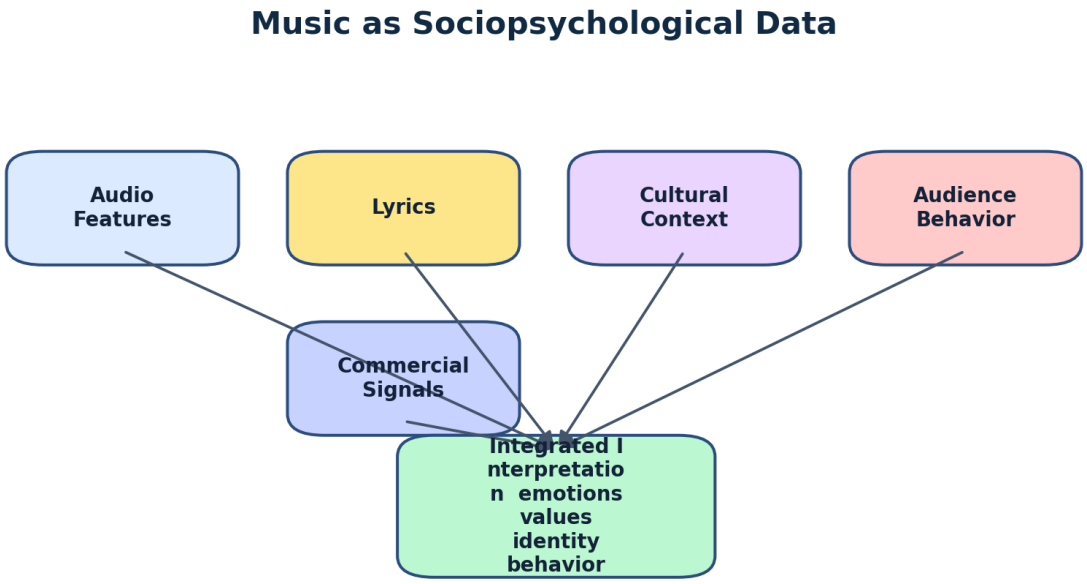

Figure 3: Music as a multi-layered sociopsychological data source. The figure shows how audio features, lyrics, cultural context, audience behavior, and commercial signals can be integrated and interpreted to infer emotional states, values, identity signals, and behavioral tendencies.

5 Rhythm, Acoustics, and State Formation

5.1 Rhythm as Temporal Organization

Rhythm is structured time. It organizes sound into patterns that the brain and body can anticipate, follow, synchronize with, and emotionally interpret. Rhythm can align with movement, heartbeat, breathing, dance, labor, ritual, speech, and collective participation.

Because rhythm operates through timing, it can influence state formation. Fast tempos may increase arousal. Slow tempos may support calm or reflection. Repetition may produce familiarity

and trance-like engagement. Syncopation may create surprise, complexity, or bodily activation. Collective rhythm can produce social synchronization, making groups feel unified.

Within MaaA, rhythm is important because it can reveal and shape how people organize energy, movement, attention, and social participation.

5.2 Acoustics as Sensory Force

Acoustics refers to the physical and perceptual qualities of sound. Frequency, amplitude, resonance, timbre, and spatial texture affect how sound is experienced by the body and brain. Low frequencies can feel powerful, grounded, threatening, sensual, or communal depending on context. Higher frequencies can feel bright, delicate, anxious, spiritual, playful, or introspective.

Acoustic features therefore participate in psychological signaling. They can intensify emotional meaning before any lyric is understood. This allows instrumental music, chants, drums, and non-verbal vocalizations to carry sociopsychological significance.

5.3 Music and the Reward System

Music can activate reward-related processes by producing expectation, surprise, resolution, repetition, memory, and emotional release. Neuroimaging and pharmacological research has linked pleasurable music to dopaminergic reward processes, including anticipation and peak emotional response (Salimpoor et al., 2011; Ferreri et al., 2019). Listeners often experience pleasure when musical patterns create tension and then resolve it, when a beat aligns with bodily movement, or when a song expresses a personally meaningful state.

This reward process helps explain why music can reinforce values and identity. When a listener receives pleasure from a song that expresses a particular worldview, the emotional reward can deepen attachment to the value system embedded in the music.

5.4 State Construction

MaaA treats musical listening as a form of state construction. A state is an organized condition of perception, feeling, memory, attention, and bodily orientation. Music can help construct states such as confidence, mourning, intimacy, nostalgia, aggression, joy, focus, spirituality, rebellion, belonging, or calm.

This is why music is used in gyms, churches, films, advertising, political rallies, weddings, funerals, military contexts, therapy sessions, nightclubs, classrooms, and personal routines. Each context uses music to produce or support a desired state.

If music can construct states, then music can be designed, selected, analyzed, and applied as a sociopsychological tool.

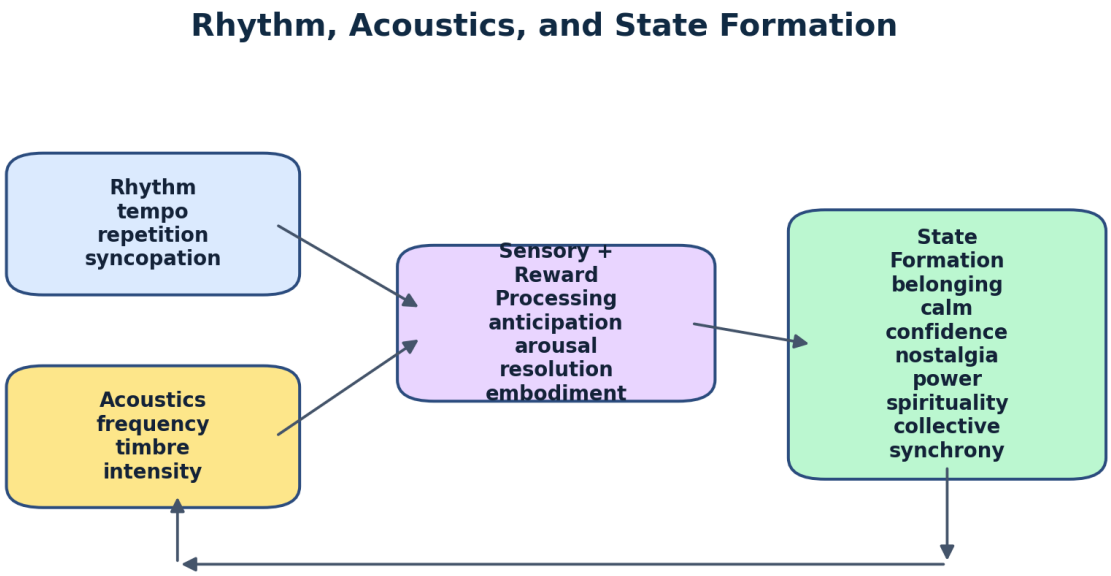

Figure 4: A schematic representation of how rhythm and acoustics contribute to state formation. Rhythmic and acoustic inputs feed into sensory and reward processing, which in turn supports the construction of experiential states such as belonging, calm, confidence, nostalgia, arousal, power, spirituality, and collective synchrony. The loop emphasizes that music is repeatedly used to regulate and reinforce states of being.

6 MaaA System Architecture

6.1 Core Premise

The core premise of MaaA is that music can operate as a functional layer between human psychology and social systems.

At the individual level, music influences emotion, memory, identity, motivation, and behavior. At the group level, it organizes belonging, norms, rituals, taste, status, and collective meaning. At the societal level, it reflects and shapes cultural trends, ideological shifts, social tensions, and commercial movements.

MaaA therefore requires a system architecture that can connect musical inputs to sociopsychological outputs.

6.2 Inputs

The MaaA system begins with musical and contextual inputs. These may include:

- audio files;
- lyrics;
- genre labels;
- artist metadata;
- release date;
- language;
- region;
- audience demographics;
- streaming behavior;
- playlist context;
- social media engagement;
- cultural references;
- performance visuals;
- historical context.

These inputs are not treated as isolated data points. They are interpreted as parts of a sociocultural signal.

6.3 Processing Layers

The MaaA processing architecture may include several layers:

1. **Audio Feature Layer**
   Extracts measurable sound features such as tempo, rhythm, spectral contrast, chroma, MFCCs, tonnetz, key, loudness, and structural repetition. These features are consistent with established music-information-retrieval practice, where audio libraries such as librosa provide tools for extracting MFCCs, chroma, spectral contrast, RMS energy, and related descriptors (McFee et al., 2015; librosa Development Team, 2026).

2. **Lyric and Language Layer**
   Analyzes sentiment, themes, metaphors, identity markers, emotional vocabulary, moral language, cultural references, and narrative patterns.

3. **Cultural Context Layer**
   Interprets genre, region, language, history, community usage, social movement associations, and symbolic meaning.

4. **EPS Mapping Layer**
   Maps musical signals to belonging, identity, power, values, pleasures, emotional states, and behavioral tendencies.

5. **Audience Response Layer**
   Measures how individuals and groups engage with the music through listening patterns, sharing behavior, comments, adoption, playlisting, and live participation.

6. **Predictive Modeling Layer**
   Uses machine learning, clustering, and statistical modeling to identify patterns, predict cultural movement, classify emotional meaning, and infer sociopsychological tendencies. This connects MaaA to the broader field of music emotion recognition, where audio, lyrics, emotion models, feature extraction, and recognition algorithms are used to classify emotional meaning in music (Han et al., 2022).

6.4 Outputs

The MaaA framework can generate several outputs:

- emotional profile of a song;
- cultural value profile;
- identity alignment profile;
- belonging signal strength;
- power or agency signal strength;
- audience resonance prediction;

- cultural similarity clusters;
- group-level emotional tendencies;
- trend forecasts;
- brand-culture alignment indicators;
- therapeutic or educational music recommendations;
- sociopsychological maps of communities.

These outputs establish MaaA as a practical framework for sociopsychological systems.

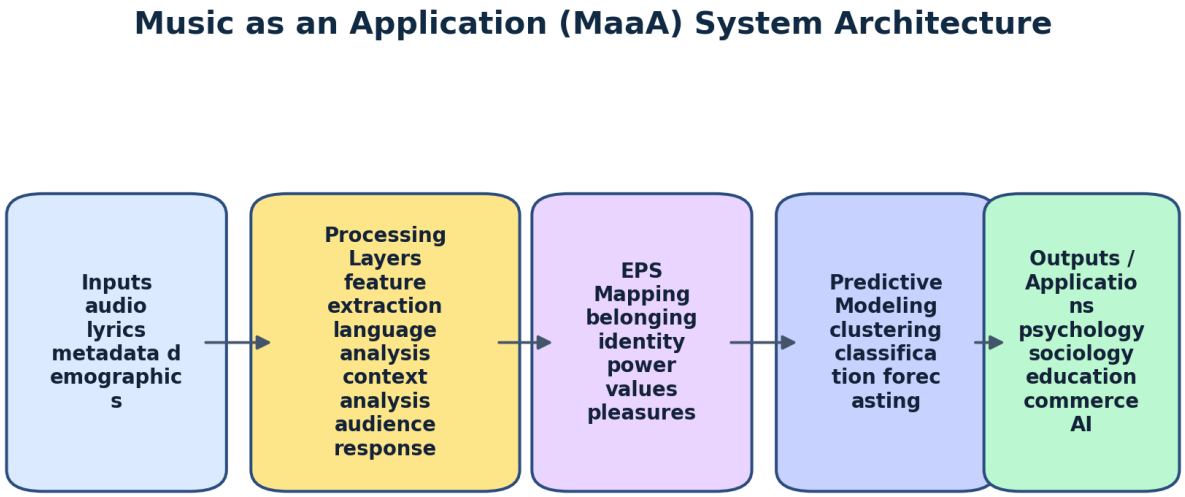

Figure 5: End-to-end system architecture for Music as an Application (MaaA). The framework begins with music-related inputs, processes them through feature extraction and contextual analysis, maps the resulting signals to EPS-based sociopsychological dimensions, and applies predictive modeling to generate outputs for psychology, sociology, commerce, education, and AI systems.

7 The Music Culture Model

7.1 Definition

The **Music Culture Model** is the computational component of MaaA. It is designed to analyze music as emotional and cultural data. Its purpose is to extract, interpret, and model the sociopsychological information embedded in musical works and their patterns of adoption.

The model does not treat music as neutral sound. It treats music as structured cultural behavior.

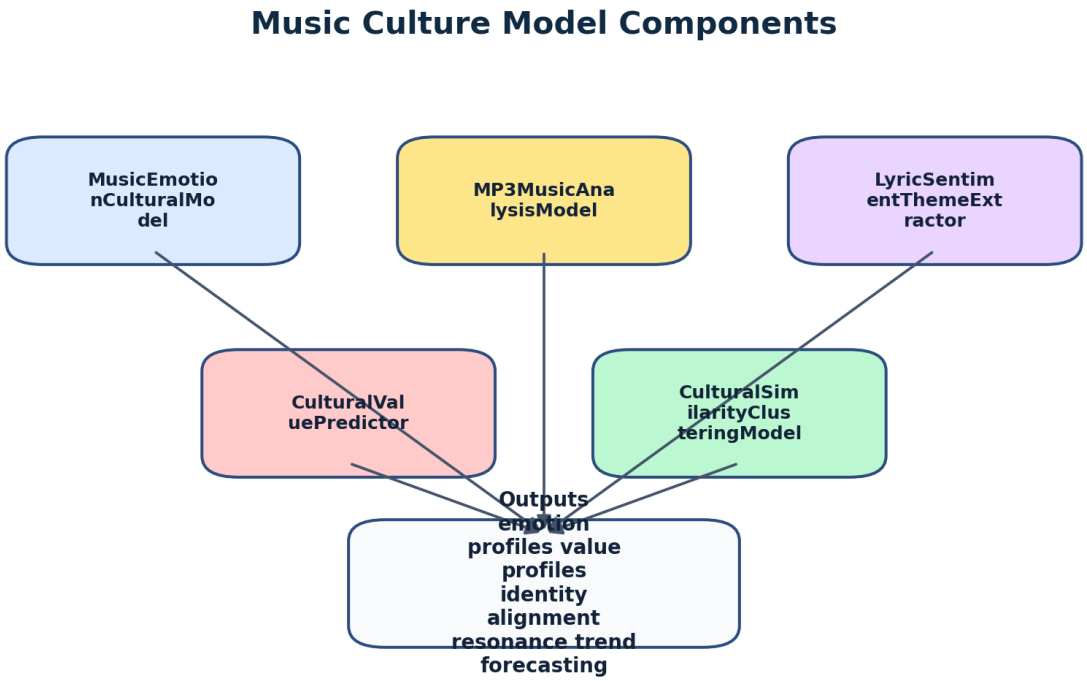

Figure 6: Core components of the Music Culture Model. The model is composed of five major modules: MusicEmotionCulturalModel, MP3MusicAnalysisModel, LyricSentimentThemeExtractor, CulturalValuePredictor, and CulturalSimilarityClusteringModel. Together, these modules transform music into analyzable outputs such as emotion profiles, cultural value profiles, identity alignment, audience resonance, and trend forecasting.

7.2 MusicEmotionCulturalModel

The **MusicEmotionCulturalModel** predicts the emotional and cultural meaning of a song based on musical and linguistic features. It may analyze tempo, rhythm, genre, lyrics, sentiment, language, and theme patterns to classify the song's likely emotional profile and cultural value orientation.

Potential outputs include:

- dominant emotion;
- secondary emotion;
- cultural value category;
- EPS alignment;
- genre-cultural association;

- theme profile;
- likely audience resonance.

This model forms the interpretive core of MaaA because it translates musical features into sociopsychological meaning.

7.3 MP3MusicAnalysisModel

The **MP3MusicAnalysisModel** extracts quantitative audio features from music files. These features may include tempo, beat structure, spectral contrast, chroma, tonnetz, MFCCs, rhythm regularity, dynamic range, and acoustic texture.

This model provides the measurable sound layer needed for downstream classification and prediction. It allows music to be processed as structured data without ignoring its sensory complexity.

7.4 LyricSentimentThemeExtractor

The **LyricSentimentThemeExtractor** analyzes lyrical content. It may detect language, translate lyrics where necessary, evaluate sentiment, extract repeated themes, identify emotional vocabulary, and detect cultural or moral concepts.

Lyrics are important because they attach explicit meaning to musical sensation. They reveal what the song is about, what values it expresses, what conflicts it contains, and what identities it speaks to.

7.5 CulturalValuePredictor

The **CulturalValuePredictor** identifies values embedded in songs. These values may include belonging, freedom, loyalty, rebellion, spirituality, romance, wealth, survival, family, national pride, resistance, status, dignity, grief, ambition, or collective memory.

This component connects MaaA directly to sociopsychological modeling. By detecting values, the system can infer what forms of meaning the music reinforces.

7.6 CulturalSimilarityClusteringModel

The **CulturalSimilarityClusteringModel** groups songs, artists, genres, or audiences based on shared cultural and emotional features. It may use unsupervised learning to identify clusters that correspond to cultural archetypes, emotional communities, regional patterns, or identity groups.

This clustering process can reveal relationships that are not obvious through genre labels alone. Two songs from different genres may share the same emotional structure or value orientation. Conversely, two songs within the same genre may represent different psychological worlds.

7.7 Predictive Cultural Modeling

Once music can be analyzed as sociopsychological data, it can support predictive modeling. Such models may help identify:

- emerging cultural moods;
- shifts in youth identity;
- changing emotional needs;
- political or social sentiment signals;
- audience fragmentation;
- brand-culture fit;
- therapeutic music pathways;
- genre evolution;
- cultural diffusion patterns.

Predictive cultural modeling is not about reducing humans to simple categories. It is about detecting patterns within large-scale cultural expression and using those patterns to better understand human systems.

8 Applications of MaaA

8.1 Psychology and Mental Health

Music is already used informally for emotional regulation. People use songs to calm down, process pain, feel motivated, grieve, focus, or feel understood. MaaA can formalize this by creating systems that match musical features to emotional needs, identity states, or therapeutic goals.

Potential applications include:

- emotion-aware playlist design;
- music-assisted therapy support;
- mood-state mapping;
- trauma-informed listening systems;
- identity reconstruction tools;
- group therapy cultural matching;
- youth emotional trend analysis.

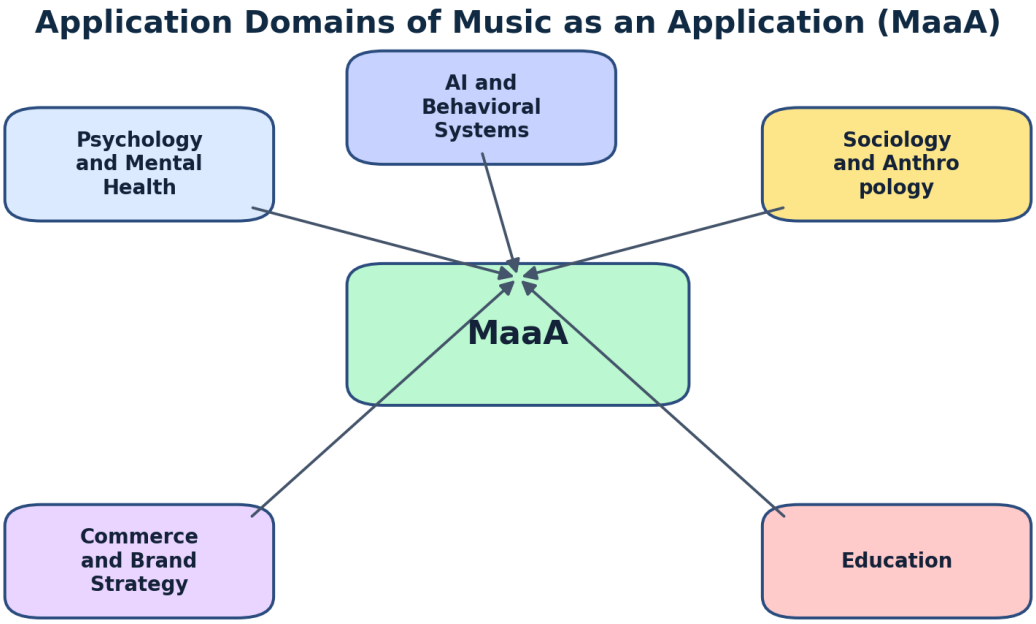

Figure 7: Major application domains of the MaaA framework. The figure shows how Music as an Application can be used across psychology and mental health, sociology and anthropology, commerce and brand strategy, education, and AI and behavioral systems, highlighting music's role as a practical layer in human-centered systems.

8.2 Sociology and Anthropology

MaaA can support sociological and anthropological research by using music as a cultural signal. Researchers can analyze how communities encode values, respond to social change, preserve history, and express identity through music.

Potential applications include:

- mapping cultural values across regions;
- studying generational identity;
- analyzing protest music and social movements;
- tracking migration and cultural blending;
- identifying emotional patterns in communities;
- understanding music as ritual and social memory.

8.3 Commerce and Brand Strategy

Brands often use music to create emotional association, but this is usually done through taste, intuition, or market research. MaaA can provide a more structured approach by analyzing whether a song, artist, genre, or sound palette aligns with a brand's target values and audience psychology.

Potential applications include:

- brand-culture alignment;
- campaign music selection;
- sonic identity design;
- audience emotional segmentation;
- cultural risk analysis;
- experiential marketing;
- creator-brand fit evaluation.

8.4 Education

Music can support education by making abstract content emotionally memorable. MaaA can help design educational experiences that use rhythm, repetition, lyrical framing, and cultural relevance to improve engagement and retention.

Potential applications include:

- curriculum-based music tools;
- culturally relevant learning materials;
- memory reinforcement through rhythm;
- language learning through songs;
- civic education through cultural music analysis;
- emotional engagement in classrooms.

8.5 Artificial Intelligence and Behavioral Systems

MaaA can contribute to AI systems that require cultural and emotional intelligence. Large-scale music analysis can provide signals about values, identity, emotion, and social dynamics that are not easily captured through text alone.

Potential applications include:

- cultural intelligence datasets;
- emotionally aware recommendation systems;
- behavioral simulation inputs;
- social trend forecasting;
- human-centered AI interfaces;
- music-based population priors for social simulation.

9 Ethical Considerations

A framework that analyzes music as sociopsychological data must be developed responsibly. Music is deeply personal and culturally sensitive. It can reveal emotional states, identity markers, group affiliations, and social vulnerabilities. Therefore, MaaA systems should be designed with ethical safeguards.

Key ethical principles include:

Consent and Transparency

Users should understand when music-based data is being analyzed and for what purpose. Systems should avoid hidden psychological profiling.

Figure 8: Ethical safeguards for the responsible development and deployment of MaaA systems. The figure highlights five core principles—consent and transparency, cultural respect, avoidance of manipulation, data protection, and interpretive humility—intended to guide the ethical use of music as sociopsychological data.

Cultural Respect

Music should not be stripped of its context or reduced to stereotypes. Cultural interpretation must account for history, community meaning, language, and lived experience.

Avoiding Manipulation

Because music can influence emotional states, MaaA should not be used to exploit vulnerable populations, intensify harmful behavior, or manipulate identity formation without accountability.

Data Protection

Listening behavior, lyric preference, emotional response, and cultural affiliation can be sensitive. MaaA systems should protect user privacy and avoid unnecessary collection of personally identifiable data.

Interpretive Humility

No model can fully capture the meaning of a song or culture. MaaA should support interpretation, not replace human judgment. Outputs should be treated as probabilistic, contextual, and revisable.

10 Discussion

MaaA reframes music as a functional medium within human systems. This does not diminish its artistic value. On the contrary, it expands the significance of music by recognizing that art is already one of the most powerful ways humans organize meaning.

The entertainment industry has monetized music's surface layer: consumption, performance, access, and intellectual property. MaaA seeks to activate a deeper layer: music's capacity to function as

emotional infrastructure, cultural data, psychological interface, and behavioral signal.

This shift has major implications. If music can be analyzed as sociopsychological data, then it can help build new systems for understanding society. If music can construct states, then it can be applied intentionally in education, therapy, commerce, social design, and AI. If music encodes values, then it can help reveal how cultures evolve, fragment, converge, or resist.

The challenge is to build these systems without flattening music into mere metrics. Music must remain a human artifact, not simply a dataset. MaaA must therefore combine computational rigor with cultural sensitivity and psychological depth.

11 Conclusion

Music as an Application (MaaA) proposes a new framework for sociopsychological systems through music. It argues that music should not be confined to entertainment, even though entertainment remains one of its most visible commercial forms. Music is also a cultural archive, emotional technology, identity system, behavioral signal, and applied interface between human psychology and society.

By grounding MaaA in Evolutionary Psychological Structures, this paper connects music to belonging, identity, power, values, pleasures, emotional states, and behavioral reinforcement. By outlining the Music Culture Model, it provides a computational pathway for analyzing music as cultural and psychological data. By identifying applications across psychology, sociology, commerce, education, and AI, it positions MaaA as both a theoretical framework and a practical foundation for future systems.

The central insight is simple but far-reaching: music is not only something humans consume. Music is something humans use to become, belong, remember, feel, signal, organize, and act.

MaaA is the framework for turning that reality into applied systems.

12 Academic Grounding and Citation Map

This section identifies the academic foundations that should support the final version of the MaaA paper. The purpose is not to make MaaA derivative of existing literature, but to anchor its claims in recognized fields while preserving its original contribution.

12.1 Ethnomusicology and Music as Culture

MaaA should be grounded in ethnomusicology, especially the view that music is not merely sound but human behavior situated inside culture. Merriam's *The Anthropology of Music* is especially useful because it frames music as something that must be studied through sound, behavior, and cultural concept. This supports MaaA's claim that music carries social meaning and can be interpreted as cultural data.

Use in paper: Sections 1, 2, 4, and 8.

12.2 Social Identity and Group Belonging

The belonging and identity dimensions of MaaA should be supported by social identity theory. Tajfel and Turner's work provides the foundation for explaining how group membership becomes part of self-concept. Research on musical taste and in-group recognition strengthens the claim that music preference can function as a social badge.

Use in paper: Sections 3.2, 4.3, 8.2, and 8.3.

12.3 Music, Reward, and Emotion

The claim that music constructs emotional states should be supported by neuroscience research on reward, pleasure, anticipation, and dopamine. Salimpoor et al. and Zatorre & Salimpoor provide a strong basis for arguing that music engages reward circuitry. Ferreri et al. strengthens this by supporting a causal role of dopaminergic transmission in musical pleasure.

Use in paper: Sections 3.1, 5.3, 5.4, and 8.1.

12.4 Music, Synchronization, and Social Bonding

The belonging function of music should be strengthened with research on musical synchronization and social bonding. Tarr et al. is especially relevant because it reviews evidence that coordinated musical movement and rhythm can support social bonding through self-other merging and neurohormonal mechanisms.

Use in paper: Sections 3.2, 5.1, and 8.2.

12.5 Music Emotion Recognition and Computational Modeling

The Music Culture Model should be grounded in music emotion recognition and music information retrieval. Han et al. provides a survey of music emotion recognition, while librosa documentation supports the technical feasibility of extracting features such as MFCCs, chroma, spectral contrast, RMS energy, and spectral descriptors.

Use in paper: Sections 6 and 7.

12.6 Music Therapy and Applied Psychology

MaaA's psychological and therapeutic applications should be supported by music therapy evidence. The Cochrane review on music therapy for depression provides a cautious but useful basis for

claiming that music therapy plus treatment as usual can reduce depressive symptoms and anxiety compared with treatment as usual alone.

Use in paper: Section 8.1.

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