

INTERNSHIP REPORT
**Molding the Mindscape : Cognitive Grounding,
Mandala Archetypes, and
Threshold Anxiety Mitigation in the
Ritual Material Culture of the Panthei**



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CHAPTER 1: INTRODUCTION

● BACKGROUND

The Panthei, a humble yet profound clay structure used in the ritualistic worship of *Maa Mangala*, stands as a testament to the deep-rooted folk traditions of Odisha. To understand the background of the Panthei, one must delve into the intersection of agrarian life, the “*Shakti*” cult, the ecological realities of the eastern Indian summer, and the unique socio-religious identity of the Odia people.

1. The Origins:

The Shakti Cult in Odisha has long been a land where the Goddess, or Shakti, reigns supreme. From the grand temple of *Maa Vimala* in Puri to the local *Gramadevati* (village goddess) residing under a banyan tree, the feminine divine is seen as the primary protector. The Panthei is specifically dedicated to Maa Mangal, the “*Auspicious Mother*”. The most significant background for this ritual is the *Kakatpur Mangala tradition*. Legend tells of the Goddess being hidden in the Prachi River to protect her from invaders. She was later recovered by a devotee on a *Tuesday* in the month of *Chaitra*. This event birthed the “*Chaitra Mangalabara Osha*” (The Tuesday Fast of Chaitra). The Panthei serves as a domestic, miniature altar - a way for women to bring the power of Kakatpur into their own courtyards.

2. The Season:

Chaitra and the “Summer of Smallpox” The background of the Panthei is inextricably linked to the month of Chaitra (mid-March to mid-April). In ancient and medieval Odisha, this period marked the onset of harsh summer heat. Historically, this was a season of dread due to the outbreak of “*Basanta*” (Smallpox) and “*Heja*” (Cholera). Maa Mangala was historically worshipped as the deity who controlled these “*heat-borne diseases*”. The ritual of the Panthei was a communal psychological and spiritual defense mechanism. By offering *Pana* (a cooling, hydrating beverage) in the clay Panthei, devotees were symbolically “cooling” the Goddess’s wrath. If the mother was cool and satisfied, the village would remain free from the “burning fever of smallpox”.

- **PURPOSE**

As an intern stepping into the rural heart of Odisha during the month of Chaitra, the first realization is that the Panthei is not a museum piece; it is a living technology. In a world increasingly dominated by digital interfaces and synthetic materials, an internship focused on the Panthei serves as a critical purpose: **re-establishing the link between human hands and the earth.**

The purpose of this internship is to decode the “**Silent Knowledge**” embedded in the structure of the Panthei. For an intern, the clay mold represents a intersection of religious fervor, social engineering and ancient thermodynamics. We are not just documenting a ritual; we are studying a survival strategy disguised as a ceremony.

1. **The Purpose of Cultural Documentation (The Anthropological Lens)**

The primary purpose of the internship is **Ethnographic Mapping**. In the age of globalization, “micro-traditions” like the Panthei Osha are at risk of being homogenized.

- **Preserving Oral History:** Many of the women who craft these structures do not follow a written manual. They follow a “muscle memory” passed down through generations. An intern’s role is to transcribe this tacit knowledge into formal documentation.
- **Understanding the “Bata” (Path) Philosophy:** The internship forces an intern to move outside the temple and into the streets. Because the Panthei is placed on the threshold, the intern learns about the **psychology of space** - how Odia culture views the “outside” as a space that needs to be sanctified and protected.

2. **The Purpose of Design Analysis (The Architectural Lens)**

From a designer’s perspective, the internship seeks to understand why the Panthei looks the way it does. The image provided shows a sophisticated use of **Geometric Abstraction**.

- **Decoding the Mandala:** The intern explores how complex spiritual concepts (like the Yantra) are simplified into a functional clay mold. Why a square? Why concentric? The intern discovers that these shapes provide structural integrity to unbaked mud while acting as a visual focal point for the practitioner.

- **Functional Minimalism:** The Panthei is a masterclass in “**Form follows Function**”. The central depression is perfectly sized for the Chaiti Pana. The internship teaches the intern that “good design” doesn’t require high-tools; it requires a deep understanding of the **medium (clay)** and the **message (offering)**.

3. The Purpose of Material Science (The Engineering Lens)

In 2026, sustainability is the core of every industry. An internship on the Panthei offers a case study in **Zero-Waste Product Lifecycles**.

- **Biodegradability by design:** Unlike modern plastic ritual items, the Panthei is “**born of the earth and returns to the earth**”. The intern studies the soil composition used - how local silt is mixed with binding agents to create a structure that holds liquid without collapsing, yet dissolves harmlessly during the first monsoon rain.
- **Thermal Study:** One of the most fascinating purposes of this internship is testing the cooling properties of the clay. An intern might use the thermal sensors to compare the temperature of Pana in a Panthei versus a plastic cup. This proves that traditional wisdom had solved the problem of summer refrigeration long before electricity.

4. The Purpose of Socio-Economic Mapping

The Panthei is a product of a specific economic ecosystem involving the **Kumbhara (Potter) Community** and the local household.

- **Studying the Maker-User Relationship:** The intern observes the supply chain. How is the clay sourced? How is it priced? Is the tradition surviving in urban areas?
- **The Gendered Economy:** Since the Osha is primarily performed by women, the internship provides insights into the **female-led cultural economy** of Odisha. It highlights the ritualistic standards that define the community’s identity.

5. The Purpose of Psychological & Health Research

Chaitra is a month of transition and disease (historically, the season of smallpox and heatwaves). The internship looks at the **Psychosomatic impact** of the ritual.

- **Ritual as Stress Relief :** The intern documents the calming effect of the ritual on the practitioners. The repetitive motions of painting the **Jhoti** around the Pathei serves as a meditative practice.
- **Nutritional Science :** By studying the ingredients of the Pana offered in the Panthei, the intern understands the “Science of the Season”. The offering is essentially an electrolyte-rich, probiotic drink. The ritual ensures that every family member consumes this health-boosting liquid during the hottest month of the year.

6. The Intern’s Personal Transformation

Beyond the data, the purpose of this internship is the **Sensory and Emotional Growth** of the student.

- **Hands-on Learning :** In a screen-heavy world, the intern feels the texture of the mud, the smell of the parched earth receiving the first drop of water and the taste of the jaggery-sweetened Pana. This “Sensory Ethnography” creates a deeper connection to the subject than any textbook could.
- **Developing Empathy :** The intern learns to respect the “unlettered” wisdom of the village. They realize that the woman making the Panthei is an engineer, an artist, and a priestess all at once.

7. The Future of The Past

The ultimate purpose of an internship on the Panthei is to prove that **tradition is not the worship of ashes, but the preservation of fire**. For an intern in 2026, the Panthei is a blueprint. It teaches us how to build things that are beautiful, functional, sustainable and deeply connected to our psychological needs. By the end of the internship, the student doesn’t just see a piece of clay; they see a 1000-year-old solution to the modern problems of isolation, environmental degradation and identity loss.

The Panthei, sitting quietly on an Odia doorstep, is a reminder that the most advanced technology is often the one that has survived the test of time using nothing but the earth beneath our feet.

- **OBJECTIVE**

- 1. Objective I : Structural Analysis and Material Science**

A technical audit of the physical form and material composition of the Panthei should be conducted.

- **Material Mapping** : Specific soil types, such as Chita Mati, Kala Mati should be researched to determine why unbaked clay is preferred over fired terracotta.
- **Geometric Documentation** : The “square-within-square” architecture should be analyzed to see if the **Vastu Purusha Mandala** is followed. Ratios should be measured across various regions to identify regional variations.
- **Functional Design** : The volume of the central depression should be investigated in relation to the “Pana” offering. Whether the design is optimized for the cooling properties of clay should be evaluated.

- 2. Objective II : The Socio-Religious Ecosystem**

The hierarchy of rituals and the role of the Panthei in domestic spaces should be mapped.

- **Gender Dynamics** : The role of women as the primary architects of this ritual should be documented. The Panthei is treated as a private altar existing outside male-dominated temple spaces.
- **Temporal Links** : The ritual is linked to the harvest cycle and the onset of the tropical summer.
- **Threshold Analysis** : The placement of the Panthei on the “Bata” (pathway) should be investigated through the lens of liminality.

- 3. Objective III : Scientific and Ecological Intersection**

The traditional knowledge systems embedded in the Panthei should be validated through scientific observation.

- **Thermodynamics** : Comparative experiments should be performed to measure the temperature of liquids in clay vs. modern materials.

- **Public Health** : Historical links between Maa Mangala and heat-borne diseases should be researched. The ritual distribution of “Pana” should be analyzed as a community hydration strategy.
- **Nutritional Audit** : The biological properties of ingredients like Neem and Jaggery should be listed and evaluated for their cooling effects.

4. Objective IV : Psychological and Semiotic Impact

The psychological comfort and community identity provided by the structure should be decoded.

- **Cognitive Grounding** : The impact of the structure’s symmetry on the mental state of the practitioner should be assessed.
- **Anxiety Management** : Practitioners should be interviewed to understand how the ritual provides a sense of perceived control over family safety.
- **Semiotic Signaling** : The Panthei should be analyzed as a signifier of divine protection to the public.

5. Objective V : Modern Challenges and Preservation

Threats to the tradition should be identified and sustainable preservation methods should be proposed.

- **Material Shift** : The transition from clay to plastic or metal should be scrutinized for the loss of ecological and thermal benefits.
- **Economic Viability** : The craft of the Kumbharas (potters) should be researched to determine if the art remains economically sustainable.

CHAPTER 2 : PROFILE OF THE ORGANIZATION

● DETAILS OF THE ORGANIZATION

In the heart of the historic “Silver City” of Cuttack, Odisha, lies a unique cultural treasure known as **Mishrashala** (also referred to as **Mishrashala - The Museum**). Unlike the grand, state-run galleries of the capital, Mishrashala is an intimate, **home-based museum** born from a singular passion: **the preservation of Odisha’s vanishing folk traditions**. Founded and curated by **Prof. Dr. Ajaya Kumar Mishra**, a retired professor of Odia literature and a dedicated academician, this institution serves as a vital bridge between the forgotten lifestyles of rural Odisha and the rapidly modernizing world of the 21st century.

1. The Genesis : From Retirement to Restoration

The story of Mishrashala began in **2020**, shortly after Dr. Ajaya Kumar Mishra retired from his distinguished academic career. While many choose a quiet retirement, Dr. Mishra felt a profound sense of urgency regarding the “**Cultural erosion**” he witnessed in the state. He observed that the tools, instruments and objects of daily life that had sustained Odia rural society for centuries - ploughs, oil presses, traditional fishing gear - were being replaced by plastic and digital alternatives.

Driven by his background in Odia literature (having authored the seminal work ‘**Odia Loka Sahitya O Odia Loka Sanskruti**’ in **1996**), he realized that preserving folk culture required more than just words; it required a physical space where these objects could be seen, touched and understood. Consequently, he transformed his residence, Mishrashala, located in **Mishraghara, Rajendra Nagar, Cuttack, Odisha 753010**, into a public-facing museum.

2. A Museum of Miniatures : Crafting the Past

What makes Mishrashala truly extraordinary is that vast majority of its **172+ exhibits** are not antique finds, but meticulous, handcrafted miniature wooden models created by Dr. Mishra himself.

The Art of Sustainable Craftmanship

Dr. Mishra’s process is a masterclass in sustainability. He utilizes discarded and natural materials to recreate the artifacts of Odisha’s history, including:

- **Raw Materials :** Wood, bamboo, cane, coconut husk, fiber, straw, palm leaves and even reed sticks.
- **Upcycling :** He often sources materials from waste, carrying a knife with him during walks to collect suitable pieces of wood or bamboo.
- **Time and Labor :** Each miniature model takes anywhere from two to fifteen days to complete, requiring immense patience and anatomical precision to ensure they represent the original tools accurately.

3. Core Collections and Exhibits

The museum is organized into thematic categories that represent the “lost lifestyles” of the Odia people. These miniature offer a 360-degree view of ancestral ingenuity.

A. Agricultural & Rural Implements

Agriculture has been the backbone of Odisha for millennia. Mishrashala showcases the evolution of farming through :

- **The traditional Plough (Langala) :** Models of various types used in different soil conditions.
- **The Oil Press (Ghana/Teli Pala) :** A traditional wooden device used by the *Teli* community to extract oil.
- **Cattle Bells and Carts :** Miniature bullock carts, including the *Thori Balada* (loaded bullocks) and *Dahi Bhara* (curd-carrying setups).

B. Occupational Tools

The museum documents the tools of various traditional castes and professions :

- **Spinning & Weaving :** The *Arata* (spinning wheel), *Kateni* and the *Tanta* (loom) which represent the rich history of Odia handlooms.
- **Pottery :** The *Kumbhara Chaka* (potter’s wheel).
- **Transport :** Elegant miniature *palanquins* (Sabari) and river boats.

C. Fishing Gear

Reflecting the importance of Odisha’s coastlines and rivers (like the Mahanadi in Cuttack), the museum features :

- **Traps & Nets :** Including the *Andhuli* (trap), *Kathi Poluha* and various nets like the *Bhounri Jal*.
- **Tools :** The *Tenta* (fishing spear).

D. Folk Musical Instruments

Music is central to Odia festivals. The collection includes :

- **Stringed & Percussion** : The *Ektara*, *Gopi Yantra*, *Kendera* and the *Dhuduki*.
- **Rhythmic Tools** : *Dasakathi* (wooden clappers used in folk theatre) and *Khanjani*.

4. Educational Impact and Social Vision

For Dr. Mishra, Mishrashala is not a static warehouse; it is a **pedagogical tool**.

- **Educational Outreach** : The museum actively hosts students from schools and colleges across Odisha. It aims to answer fundamental questions for the youth : How did our ancestors farm? What music did they play ? How did they survive without electricity ?
- **Hands-on Training** : Dr. Mishra conducts workshops for children, teaching them how to create art from discarded materials, fostering a spirit of environmental consciousness and creativity.
- **Heritage-Focused Content** : His work has contributed to the development of academic materials that help reconnect younger generations with their sustainable, “green” roots.

5. Mishrashala : A Sanctuary of Odia Heritage in Cuttack

Mishrashala stands as a testament to the fact that one individual’s dedication can safeguard a civilization’s memory. By shrinking the massive tool of the past into delicate miniatures, Dr. Ajaya Mishra has made the history of Odisha accessible and portable. The museum reminds us that while technology moves forward, our regional identity is rooted in the ingenuity and resourcefulness of those who came before us.

Whether a student or a traveler looking for the “soul” of Odisha, a visit to Mishrashala offers a rare opportunity to witness a world that is fast disappearing-one wooden model at a time.

● LOCATION AND GENERAL INFORMATION

Culture is an evolving tapestry, but in the rapid rush toward modernization and digitization, the physical artifacts that once defined the rhythm of daily life frequently face structural obsolescence. In the millennium city of Cuttack, Odisha, a unique cultural endeavor seeks to address this specific challenge. **Mishrashala** (also known as **Mishrashala : A Museum of dying tradition**) is a specialized home-grown repository designed to document, recreate and preserve the disappearing agrarian, domestic and linguistic heritage of traditional Odia households. Mishrashala stands as a compelling testament to the power of individual curatorial vision in the field of heritage preservation.

Unlike large-scale state repositories that focus on archaeological remnants, ancient numismatics, or major historical dynastic relics, Mishrashala operates at the intersection of folk ethnography, micro-craftsmanship and pedagogical preservation. It serves as an archive of everyday historical utility, displaying miniature, structurally accurate models of tools, household implements and transport systems that once formed the bedrock of rural and semi-urban life across Odisha.

1. Location and Geographical Context

Mishrashala is centrally located within the urban geography of Cuttack, an ancient city nestled between the bifurcating forks of the Mahanadi and Kathajodi rivers.

2. Exact Address & Physical Coordinates

The physical repository is situated in **Rajendra Nagar (near Madhupatna), Cuttack, Odisha, Pin code : 753010**.

3. Regional Infrastructure and Accessibility

Cuttack is one of India's oldest continuously inhabited urban centres, characterized by an intricate network of traditional neighborhoods (*Sahis*), colonial institutional areas, and modern residential developments. The museum is positioned in an accessible pocket of the city, well-linked to key transit pipelines.

- **By Roadways :** The museum is highly accessible via transport routes within Cuttack. It sits within proximity to major urban junctions such as the **Madhupatna Square** and the **Netaji Bus Terminal (CNBT)**, which handles regional and interstate bus networks. Visitors navigating through local transit systems can reach Rajendra Nagar using auto-rickshaws, cycle-rickshaws, or localized ride-hailing services.

- **By Railways :** The **Cuttack Railway Station (CTC)**, a major junction under the **East Coast Railway zone**, is located within a **2 to 3 kilometer** radius of the museum. This ensures easy entry for visitors travelling from other major cultural hubs within Odisha, such as Puri or Sambalpur, as well as adjacent states.
- **By Airways :** For national and international visitors, the nearest aviation facility is the **Biju Patnaik International Airport (BBI)** located in the capital city of **Bhubaneswar**, approximately **30 to 35 kilometers** away. The dual-carriage **National Highway 16 (NH 16)** provides a seamless vehicular connection between the airport and Cuttack, allowing an approximately travel time of 45 to 60 minutes depending on peak traffic conditions.

4. Ideological Vision and Founder's Philosophy

Mishrashala was conceptualized, built, and curated through the individual efforts of **Prof. Dr. Ajaya Kumar Mishra**, a retired academician, researcher, and litterateur based in Cuttack. The foundation of the repository stems from a critical socio-cultural observation : when a community discards its material lifestyle in favor of high-tech digitalized frameworks, it simultaneously induces irreversible damage to its linguistic and anthropological heritage.

5. The Material-Linguistic Connection

Dr. Mishra's primary curatorial philosophy highlights that vocabulary is fundamentally tied to material culture. When tools like the *Langala* (plough), *Jua* (yoke), or *Sagada* (bullock cart) disappear from daily sight, the corresponding words, folk songs, idioms, and oral narratives associated with those items also fade from the active lexicon of younger generations. The museum's foundational objective is to mitigate this systemic erasure by keeping the material reference points alive.

6. The Dynamic Nature : A Mobile and Educational Museum

One of the defining structural features of Mishrashala is its mobile and itinerant model. While its physical base remains in Rajendra Nagar, Cuttack, it does not function solely behind stationary glass display cabinets.

7. Community and Institutional Outreach

The museum frequently packs its exhibits and travels directly to educational institutions, schools, cultural exhibitions, and state-level literary festivals across Odisha. A prominent example includes its extensive participation in state-sponsored youth festivals such as the *Surabhi children's festival*, where hundreds of school children interact directly with the artifacts.

8. Pedagogical Utility

During these travelling exhibitions, the museum shifts from a repository to a classroom. Dr. Mishra acts as an active educator, using the physical replicas to deliver interactive lectures. Students are taught :

- I. The scientific and mechanical principles underlying traditional tools (such as leverage, balancing, and torque in ancient oil presses or water pulleys).
- II. The socioeconomic structures of historical Odia villages, explaining how specific tools facilitated community interdependence.
- III. The linguistic vocabulary associated with the parts of each tool, enriching the students' regional language skills.

9. Typology of the Collection and Key Artifacts

The collection at Mishrashala comprises over **300 unique, handcrafted miniature models and traditional household items**. Each model is created with meticulous attention to detail, maintaining the precise structural proportion of the original full-sized tools. The material palette utilized for these models relies strictly on indigenous elements : palm leaves, bamboo splints, coconut coir, seasoned wood, clay, thread, and local reeds.

The artifacts displayed can be broadly categorized into distinct thematic zones :

a) Traditional Agrarian Machinery and Implements

Agriculture was the economic spine of historical Odisha. The museum features an exhaustive layout of structural models representing the complete farming cycle :

- **The Langala and Jua (Plough and Yoke) :** Miniature replicas demonstrating how timber beams were joined, carved, and fitted with iron shears for tilling soil.

- **Water Management Systems** : Scaled model of traditional irrigation devices like the *Sena* (swing basket) and the *Tendha* (a counterpoise water lift mechanism used to draw water from shallow wells or canals). These displays show how ancient farmers manipulated gravity and levers to optimize agricultural output without electricity.
- **Harvesting and processing Tools** : Models of thrashing tools, winnowing baskets (*kula*), grain storage bins constructed from woven straw ropes (*muda* or *oliia*), and traditional husking pedals known as the *Dheki*. The Dheki model functions mechanically, demonstrating how foot-operated leverage was used to de-husk paddy grains.

b) Pre-Industrial transportation and Logistical Systems

Before the advent of motorization, the movement of people and commodities across Odisha's coastal deltas and hilly hinterlands relied on specialized non-motorized transport. Mishrashala preserves the structural engineering designs of these systems:

- **The *Sagada* (Traditional Bullock Cart)** : Featuring solid wooden wheels without spokes, typical of the coastal region, showcasing how heavy logs or agricultural yields were transported across uneven mud tracks.
- **Palanquins (*Palkis*)** : Miniatures of ornate and functional palanquins used for transporting royalty, local nobility, or brides during traditional wedding ceremonies. These models capture the ergonomic design of the carrying poles and the ventilation structures of the inner cabin.
- **Watercraft** : Simple riverboats used for navigating the complex deltaic distributaries of the Mahanadi river system.

c) Indigenous Household Utility and Domestic Ware

The domestic sphere of an old Odia home contained a massive array of specialized tools designed for processing food, storage, and oil extraction :

- **The *Ghana* (Traditional oil press)** : A highly sophisticated miniature representation of the animal-driven wooden mortar-and-pestle mechanism used to extract oil from oilseeds like mustard and sesame.

- **Kitchen Architecture and Grinding Tools :** Replicas of the *silapua* (grinding stone), *Ghadia* (stone mortar), and various hand-cranked stone mills (*chaki*) used for processing lentils and grains.
- **Weaving and Rope-Making Devices :** Simple hand-operated spindles and models that illustrate how rural households spun yarn and processed wild reeds or coconut fibers into durable cords.

d) Folk Epigraphy and Traditional Documentation

The collection includes practical demonstrations of traditional writing systems. This includes the preparation of palm-traditional manuscripts (Talapatra chitra/pothi), showing the specialized iron stylus (Lekhani) used by traditional scribes to incise text onto seasoned palm leaves, a methodology that preserved Odisha's classical literature for centuries.

10. Curatorial Innovation : Integrating Art, Craft, and Poetry

What differentiates Mishrashala from conventional ethnological exhibitions is its unique approach to interpretation. Dr Mishra does not merely display an object with a sterile, brief label. Instead, he pairs each miniature replica with **short, custom-composed poems and explanatory verses** written in Odia.

11. The Role of Explanatory Verses

These verses are designed with rhythmic cadence to appeal to both children and adults. A typical poem attached to an exhibit will :

- Name the tool and its historical variants.
- Describe its mechanical action in simple terms.
- Incorporate the specific folk idioms or proverbs that contain the object's name.

This methodology bridges the gap between material arts and linguistic literature, transforming a physical visit into an educational experience that engages multiple senses.

12. Socio-Cultural Relevance and Preservation Value

The emergence of a space like Mishrashala within Cuttack is highly relevant given the broader challenges of urban heritage management.

a) Preventing Cultural Annihilation

As society shifts entirely toward digital tools and automated systems, the physical links to past manual lifestyles are rapidly discarded. Old wooden implements are often broken down for fuel, and ancestral homes are cleared of their heritage items. Mishrashala acts as a salvage archive, collecting these memories before they face total physical erasure.

b) Revitalizing Intangible Linguistic Heritage

For language to stay vibrant, its words must remain anchored to physical realities or active concepts. By displaying a *Tendha* or a *Ghana*, Mishrashala ensures that when a student reads classical Odia literature or folk poetry containing these words, the terms are not merely abstract historical concepts but clearly understood tools with distinct structural forms and functions.

c) Institutional Validation and Public Recognition

The unique nature of Mishrashala has attracted substantial interest from the highest echelons of Odisha's cultural and administrative sectors. Key seminars, webinars, and public exhibitions dedicated to the museum's work have seen participation from senior administrators, including Principal Secretaries and Directors from the Department of Odia Language, Literature, and Culture. Intellectuals, art historians, and international Odia diaspora members from cities like Toronto and London have engaged with the museum's digital webinars, identifying it as a crucial model for grassroots heritage preservation

13. Practical Visitor Information and Guidelines

For individuals, educators, and cultural researchers planning an itinerary to explore the museum, the following operational matrix outlines the general visitor guidelines:

Operational Parameter	Detailed Specifications
Primary Location	Rajendra Nagar, Near Madhupatna, Cuttack, Odisha 753010
Nature of Display	Private Home-Museum with active mobile outreach modules
Target Audience	School students, Research scholars, Historians, Folk culture enthusiasts
Core Exhibits	300+ miniature wooden, Bamboo, and Clay Replicas of Traditional Implements
Key Facilities	Guided Curator Interactions, Pedagogical Demonstration Kits, Explanatory Poetic Labels
Best Approach	Advance communication is recommended for institutional student visits or detailed research access, given its dual role as a private workshop and a public outreach archive

● NATURE OF ACTIVITIES / SERVICES

1. Documentation and Miniature Woodcrafting Services

The foundational service of Mishrashala revolves around its highly detailed, architecturally accurate **miniature engineering and crafting operations**. Rather than merely collecting deteriorating original pieces, the institution actively maps, scales, and hand-crafts exact wood-sculpted replicas of historic Odia tools, transport systems, and household implements.

Technical Mapping of Heritage Artifacts :

Before any physical craftsmanship begins, Mishrashala functions as an engineering field research team.

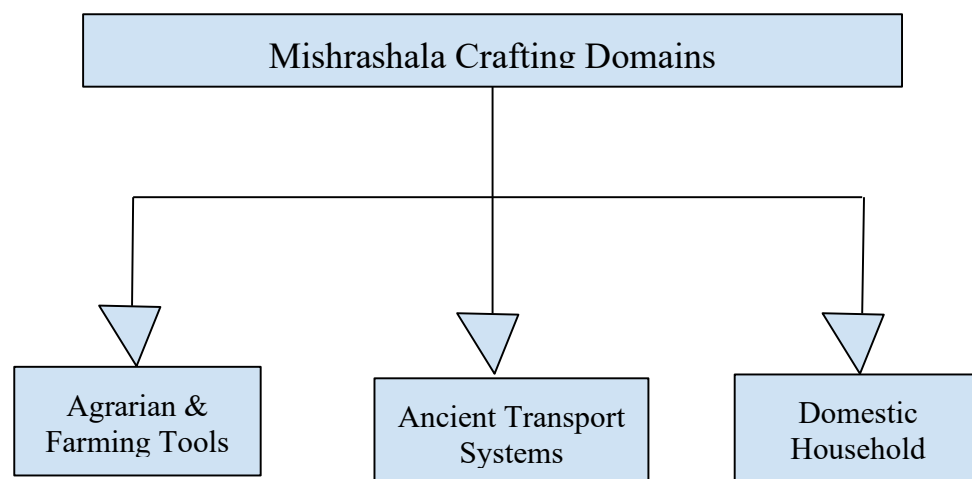
- **Field Surveying** : The organization conducts extensive rural expeditions across Odisha's interior districts (such as Mayurbhanj, Ganjam, Koraput,

and Kendrapara) to locate last-surviving structural remnants of traditional Odia machinery.

- **Blueprint Drafting** : Because original blueprints for medieval and early-modern Odia village tools do not exist, the technical team performs manual dimensions checks, load-bearing assessments, and spatial measurements of surviving artifacts to create scaled technical schematics.
- **Material Sourcing** : Replicas are built utilizing traditional, locally responsive wood variants such as Neem (*Azadirachta indica*), Gambhari (*Gmelina arborea*), or Sal (*Shorea robusta*) - ensuring the miniature models maintain identical structural integrity, weight distribution, grain pattern, and longevity as their full-sized historical counterparts.

Specialized Categories of Restored Models :

Mishrashala divides its crafting activities into distinct functional domains, creating a comprehensive material encyclopedia of ancient and medieval Odia infrastructure:



- **Agrarian Mechanical Tools** : Crafting detailed functional models of the *Langala* (traditional wooden plough), *Iasni* (soil levelers), *Sagana* (harrows), and complex manual irrigation systems like the *Tendha* and *Jana* (wooden lever counterweights used to lift water from well systems into canals).
- **Ancient Transport Infrastructure** : Reconstructing intricate replicas of historical transport, including multiple variants of the *Sagadi* (traditional heavy bullock carts with solid wooden wheels), *Sabari* or palanquin (human-carried royal and bridal transport boxes with intricately carved

suspension poles), and riverine boats used historically along the Mahanadi and Prachi rivers.

- **Domestic Household Technologies :** Replicating everyday machinery that sustained preindustrial Odia kitchens, such as the *Dheki* (a foot-operated wooden lever system used for dehusking paddy and grinding grains), *Chata* (stone and wood rotary hand-mills), and wooden neck-bells (*Gagidi*) explicitly crafted for livestock management.

2. Archival, Linguistic, and Museological Activities

Mishrashala recognizes that a physical object cannot be decoupled from its linguistic framework. When a tool like the *Dheki* vanishes, the specialized vocabulary used to describe its component parts also fades from the language. Therefore, the institution integrates classic museological archiving with **ethno-linguistic preservation**.

Systematic Material Archiving :

The institution serves as a clean, temperature-moderated public museum ecosystem within Cuttack. Each miniature model and collected artifact undergoes a strict museological indexing process :

- **Accessioning :** Objects are categorized under specific societal eras and geographical points of origin within Odisha.
- **Contextual Epigraphy :** Every item is paired with clear explanatory documentation written in both Odia and English, describing its historical timeline, operational mechanics, and social context.
- **Linguistic Mapping :** Mishrashala meticulously records the precise regional dialects and original nomenclature of the components of each tool. For example, a plough model is not labeled generally; instead, its individual structural parts- such as *Isha* (the long central pole) the *Kshua* (the iron share), and the *Juali* (the yoke) - are clearly mapped to preserve the technical lexicon of the Odia language.

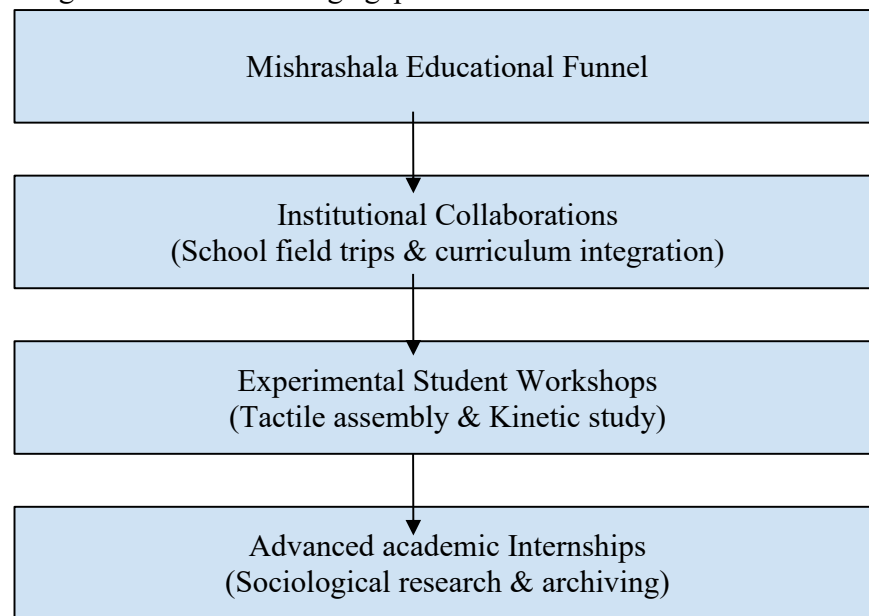
Creative Literary Preservation :

A highly unique service pioneered by Mishrashala is the pairing of physical curation with **vernacular mnemonic poetry**. To make the dry mechanics of ancient tools accessible and memorable for younger generations, the facility curates

short, rhythmic Odia poems (*Chhanda* and *Kabita*) alongside each exhibit. These poems describe how the tool was handled, its rhythmic sound profile during operation, and its role in the seasonal rhythms of Odia village life.

3. Educational Outreach and Public Consciousness Services

Mishrashala acts as a critical auxiliary educational center for schools, universities, and research fellowships across Eastern India, offering targeted services to bridge the generational knowledge gap.



Institutional Collaborations and Curricular Support :

The museum provides tailored educational tours designed explicitly for primary, secondary, and higher-secondary students. By collaborating with regional schools and the state department of education, Mishrashala provides a concrete learning environment for history, sociology, and language classes. Students who have only read about historical Odia lifestyles in textbooks can interact with three-dimensional representations, shifting their learning experience from passive rote memorization to active visual and spatial comprehension.

Experiential Workshops and Interactive Learning :

Unlike highly restrictive traditional museums where artifacts are kept strictly behind glass enclosures, Mishrashala provides **tactile educational services**. Under

supervised settings, students and visitors are encouraged to touch, operate, and study the mechanical movements of the models:

- **Kinetic Demonstration** : Instructors demonstrate the mechanical advantages of early Odia engineering, showing how levers, pivots, counterweights, and wheel axles allowed rural ancestors to maximize physical force.
- **Model Assembly Seminars** : Specialized workshops teach youth the basics of traditional carpentry, wood joinery without modern metal nails, and the physics behind ancient design philosophies.

Research Fellowships and Higher Academic Services :

For university students specializing in Cultural Anthropology, Odia Literature, Indology, and Ancient History, Mishrashala offers a specialized research environment. The facility provides access to its comprehensive library of technical drawings, oral history recordings, and field notes, serving as a hub for undergraduate dissertations and post-doctoral research papers focusing on the material culture of Eastern India.

4. Digital Archiving and Global Virtual Services

To ensure that its preservation activities reach beyond the physical confines of its facility in Cuttack, Mishrashala has embraced modern technology to create globally accessible digital platforms.

Webinar Series and Global Cultural Panels :

The institution regularly hosts international webinars and virtual symposia that unite administrators, artists, language experts, and members of the global Odia diaspora. These events serve multiple academic functions:

- **Global Dialogues** : Connecting researchers from institutions worldwide to discuss preservation strategies for dying material cultures.
- **Diaspora Integration** : Providing second- and third-generation non-resident Odias across Europe, North America, and Southeast Asia a direct window into their ancestral roots, language, and cultural practices.

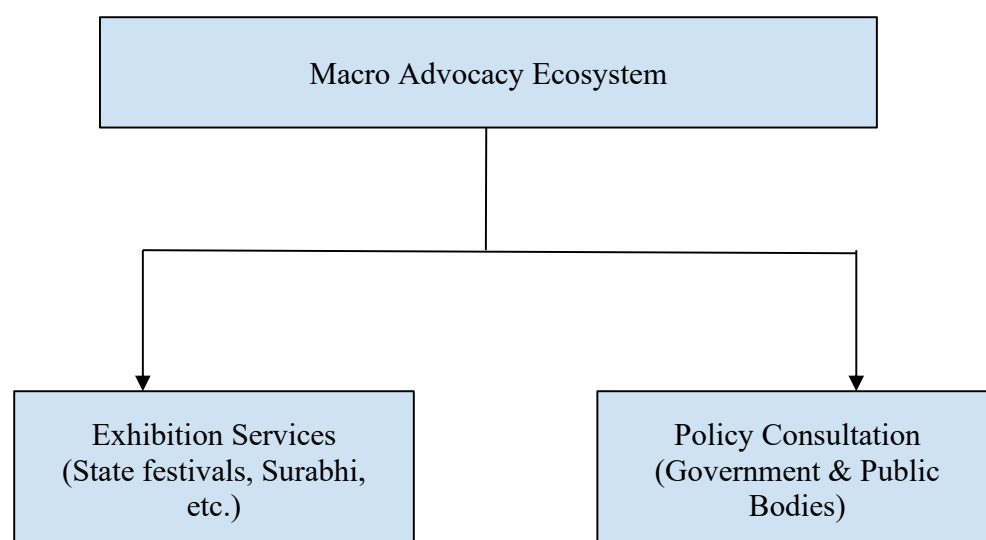
Multi-Media Production and Digital Curation :

Mishrashala's digital production division records, edits, and distributes high-fidelity multimedia assets to preserve the sights and sounds of ancient traditions:

- **Video Documentaries** : Producing narrative short films and documentaries detailing the construction methods of traditional tools, complete with voiceovers and detailed scripts.
- **Acoustic Archiving** : Recording the distinct soundscapes of vanishing technologies-such as the rhythmic thumping of a Dheki or the creaking of a bullock cart's wooden axle-preserving an audio record of a past era.
- **Virtual Museum Access** : Designing and publishing digital catalogs and immersive video walkthroughs, making the museum's collection accessible to researchers who cannot visit the physical site.

5. Community-Level Preservation Advocacy and Consultancy

Beyond its institutional walls, Mishrashala works closely with regional communities, governmental bodies, and arts festivals to advocate for heritage preservation on a macro scale.



Participation in State-Level Festivals and Public Curation :

Mishrashala translates its private collection into public installations by frequently participating in high-visibility cultural events across India.

- **State Children's Festivals (e.g., Surabhi) :** Setting up dedicated mobile museum pavilions where thousands of students interact directly with historical models.
- **Art and Craft Melas (e.g., Kala Bhoomi events) :** Creating curated pop-up galleries that showcase the evolution of Odishan rural technology alongside live demonstrations of heritage woodcrafting.

Policy Consultation for Heritage Bodies :

Leveraging its deep repository of field data, Mishrashala provides expert consultancy services to state departments of culture, municipal corporations, and private heritage trusts:

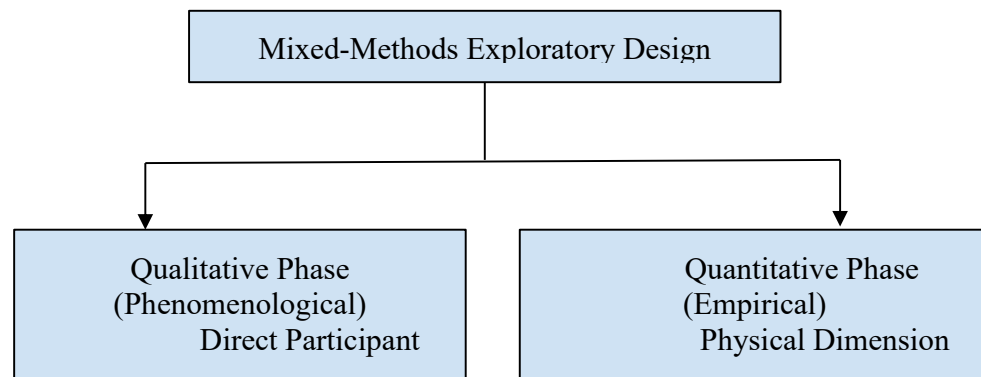
- **Museum Design Advisory :** Assisting public bodies in setting up local ethnographic museums and village heritage corners.
- **Authenticity Validation :** Providing historical validation and architectural consulting for public works, cinematic productions, or theatrical sets that require accurate depictions of pre-modern Odia lifestyles and tools.

CHAPTER 3 : METHODOLOGY/WORK PLAN

● APPROACH ADOPTED BY THE STUDENT

A mixed-methods exploratory research design was adopted to investigate the structural, material, and socio-cultural dimensions of the Panthei during the internship period. Because this cultural object exists at the intersection of tangible material craft and intangible ritual heritage, data collection was structured to capture both empirical physical attributes and qualitative community narratives.

1. Research Design and Approach



An interdisciplinary framework was established, combining qualitative ethnographic inquiry with quantitative structural mapping.

- **Qualitative Phase** : A phenomenological approach was chosen to document the lived experiences, ritual interpretations, and traditional knowledge of the practitioners and artisans.
- **Quantitative Phase** : An empirical approach was utilized to measure, record, and categorize the geometric variations of the clay molds across different field locations.

2. Study Setting and Field Site Selection

Fieldwork was conducted within the coastal cultural landscape of Odisha during the Hindu calendar month of *Chaitra*. Purposive sampling was used to select the primary field sites, ensuring proximity to regions with deep-rooted traditions of Shakti worship and functional pottery ecosystems.

- **Primary Sites :** Investigations were focused within the Prachi River Valley corridor, specifically targeting rural settlements around *Kakatpur* (Puri district), recognized as the geographic epicenter of the Maa Mangala tradition.
- **Artisan Clusters :** Local Kumbhara *Sahis* (potter quarters) within these villages were mapped and visited to document the physical manufacturing phase of the structures.

3. Sampling Strategy and Informant Selection

Non-probability sampling techniques were deployed to select informants due to the specialized, localized nature of the ritual craft.

- **Purposive Sampling :** Used to identify and select traditional potters (*Kumbharas*). A selection criterion of a minimum of 15 years of experience in fabricating ritual clayware was maintained. A total of 8 master artisans were interviewed.
- **Snowball Sampling :** Utilized within the domestic sphere to identify elderly female practitioners (*Osha Bratis*) who possess long-standing knowledge of the *Chaitra Mangalabara rituals*. Introductions from community elders led to a final cohort of 35 practitioners across varying age brackets.

4. Methods of Data Collection

Data collection was divided into three operational techniques to ensure comprehensive documentation:

A. Participant Observation

Direct observation was carried out during the *consecutive Tuesdays* of the *Chaitra* month. Observations were focused on the physical handling of the Panthei, its decoration with *Jhoti* (rice paste art), its placement at the household threshold (*Bata*), the pouring of *Chaiti Pana*, and its ultimate post-ritual return to the soil. Detailed descriptions and behavioral responses were recorded in field logs.

B. Semi-Structured Interviews

Field interviews were conducted using loose, open-ended interview guides.

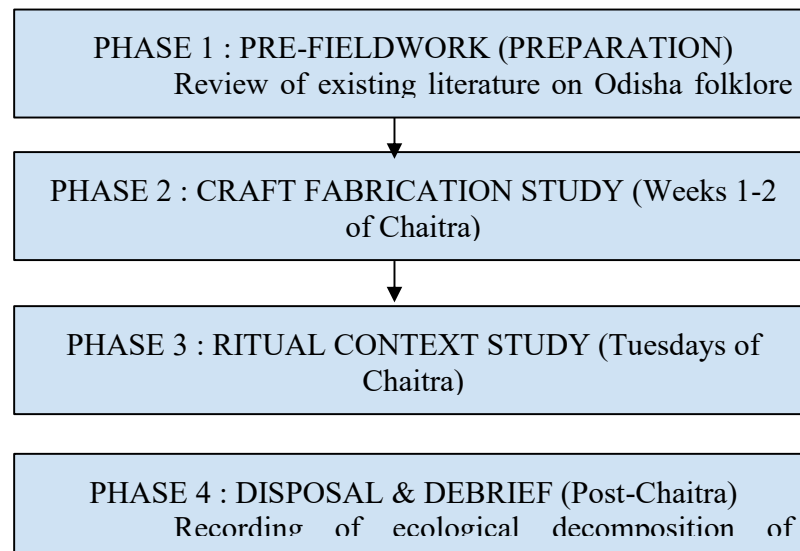
- Interviews with artisans were aimed at capturing technical data: soil source selection, clay kneading properties, moisture control, and the geometric logic of the mold design.
- Interviews with practitioners focused on the perceived psychological benefits, familial motivations, and the intergenerational transmission of the fast.

C. Structural and Material Mapping

The physical properties of the Panthei were empirically profiled. Structural metrics—including outer boundary lengths, depth of the central fluid cavity, wall thickness, and base surface area—were measured using a metric tape and digital calipers. Photographic documentation was maintained to create a visual typology of geometric variations.

5. Procedural Framework

The execution of the field study was systematically phased across the duration of the internship timeline :



6. Data Analysis

Data processing was divided into qualitative and quantitative tracks to match the mixed-methods design :

- **Qualitative Analysis** : Audio recordings from field interviews were transcribed from rural Odia dialects, translated into English, and subjected to inductive thematic analysis. Text segments were systematically categorized under codes such as "*Thermal Insulation*," "*Threshold Security*," and "*Material Fragility*" to extract broader cultural and functional patterns.
- **Quantitative Analysis** : Structural dimensions and demographic distribution data were compiled using spreadsheet software. Descriptive statistics (mean values, ranges, and percentage frequencies) were computed to identify standard dimensions and track generational changes in participation rates.

7. Triangulation Framework

To ensure analytical rigor and prevent one-dimensional interpretations, an interdisciplinary triangulation matrix was developed. Collected data was cross-verified through three distinct academic perspectives :

- **Anthropological/Historical Validation** : Oral testimonies regarding Maa Mangala and Bata Osha were cross-checked against documented texts on Odishan folklore to analyze structural or ritual shifts over time.
- **Psychological Evaluation** : Interview data from domestic practitioners were analyzed against theories of liminal spaces and sacred geometry (Mandalas) to explore themes of threshold anxiety and mental grounding.
- **Material-Science Assessment** : The physical functionality of the unbaked porous clay was monitored under field temperatures. The cooling rate of the fluid held in the Panthei was observed relative to the external ambient heat of the summer season.

8. Ethical Safeguards

Given the sensitive nature of studying private domestic rituals and indigenous craft systems, strict ethical protocols were maintained throughout the fieldwork :

- **Informed Consent** : Verbal and written consent was secured from all participants prior to interviews, audio recording, or photography. The academic, non-commercial intent of the internship report was explicitly communicated.

- **Cultural Sensitivity** : Local domestic norms were strictly observed. Purity protocols (*Nistha*) regarding footwear, dress codes, and restricted access to cooking/worship zones were adhered to during household visits.
- **Anonymity** : Identities of vulnerable rural informants and traditional potters were masked using coded pseudonyms within the final data tables to preserve privacy.
- **Knowledge Credit** : Indigenous design methodologies and technical secrets shared by the *Kumbhara* artisans were explicitly credited to their respective communities, preventing intellectual misappropriation.

9. Methodological Limitations

Several boundaries and operational constraints were encountered during the study:

- **Temporal Limits** : The field investigation was strictly bound to the temporal window of the month of Chaitra. Consequently, the seasonal cycle of the craft beyond this festival month could not be longitudinally observed.
- **Geographic Scope** : The study was confined to select rural clusters within the coastal Prachi Valley. Regional stylistic variations of the Panthei in western or northern districts of Odisha were excluded from the purview of this research.
- **Climatic Constraints** : Severe regional heatwaves during April and May limited active field observation hours primarily to the early mornings and late evenings, which compressed the available windows for extensive community interviewing.

● TOOLS AND TECHNIQUES USED

To systematically document the structural attributes, material properties, and socio-cultural expressions of the Panthei during the Chaitra Mangalabara rituals, a multi-pronged methodological toolkit was deployed. Fieldwork within ethnographic and material culture studies necessitates the use of both structured empirical tools and adaptive qualitative techniques.

The primary data collection relied upon five core methodological instruments : **Participant and Non-Participant Observation, Semi-Structured Interactions and Interviews, Field Survey Questionnaires, Digital Material Documentation, and Typological Mapping**. These tools were implemented in a sequential and overlapping manner to ensure that data gathered through one technique could be cross-verified and triangulated through another.

1. Observation Techniques

Observation served as the foundational entry point into the field. Because ritual practices involve deep-seated, often unconscious physical gestures and spatial arrangements, direct observation allowed for the capture of behaviors that informants might fail to mention during verbal interviews. This technique was divided into two distinct modalities: non-participant structural observation and active participant observation.

a) Non-Participant Structural Observation

This technique was utilized primarily within the *Kumbhara Sahis* (artisan pottery quarters) during the pre-ritual manufacturing phase. The researcher maintained an unobtrusive presence to document the raw physical workflow of the artisans without interrupting the kinetic rhythm of production.

- **Material Processing :** Close observation was directed toward the raw clay preparation. The exact ratio of riverbed silt to fine pond mud, the volume of water introduced during kneading, and the manual extraction of stone impurities were systematically noted.
- **Kinetic Shaping :** The physical action of molding the Panthei was observed. Attention was paid to how the artisan's thumbs were used to press out the central fluid cavity while the fingers maintained the outer rectangular parameters. The spatial layout of the workshops, the positioning of the drying racks away from direct midday sunlight, and the structural configurations of the traditional wood-fired kilns were mapped visually.

b) Participant Observation

This approach was deployed within domestic thresholds during the Tuesdays of the Chaitra month. To gain authentic access to the private worship spaces of the household (Garha or front courtyards), the researcher conformed to local cultural expectations, observing fasts, removing footwear, and maintaining ritual distance when required.

- **Threshold Placement :** The precise orientation of the Panthei relative to the main entrance (*Bata*) was observed. Notes were taken

on how the ground was purified with cow dung paste or water before the structure was set down.

- **Ritual Kinetics** : The step-by-step enactment of the Osha was recorded. This included the rhythmic chanting of the *Mangala Stuti*, the exact hand movements used during the pouring of the *Chaiti Pana*, and the binding of sacred red threads (*Brata*) around the structural edges of the clay mold. By participating in the shared sensory environment-experiencing the ambient heat, the scent of burning camphor, and the cooling properties of the clay-held fluid-a deeper visceral understanding of the ritual context was achieved.

2. Semi-Structured Interactions and Oral Interviews

While observation provided data on what was being done, verbal interactions were essential to decipher why it was being done. Rather than using rigid, highly formal questionnaires that could alienate rural informants, semi-structured interactions were preferred. This allowed dialogues to flow naturally into storytelling, myth-sharing, and emotional expressions.

a) Artisan Interactions (The Makers)

Interviews with the traditional potters were structured around the technical, economic, and generational aspects of the craft. An interview guide was used to steer the conversation, covering several key investigative axes:

- **Geometric Rules** : Artisans were questioned regarding the origin of the square-within-square layout. Inquiries were made into whether written manuals or ancestral verbal blueprints guided the symmetry of the concentric borders.
- **Economic Variables** : Dialogues were directed toward the material cost of sourcing specific clays, the time investment per unit, and the market viability of clay Panthei structures in the face of modern mass-produced plastic or metal ritual plates.
- **Knowledge Loss** : Conversations explored whether the younger generation of the potter families was being trained in this specific geometric molding technique, capturing the socio-economic vulnerabilities of the craft community.

b) Practitioner Interactions (The Users)

Interviews with the female devotees (*Osha Bratis*) were designed to capture the psychological, domestic, and theological aspects of the Panthei usage. These dialogues were often conducted in group settings on the verandas of rural homes post-puja, fostering a collaborative memory-sharing environment.

- **Symbolic Literacy** : Informants were asked to explain their personal interpretations of the structural parts of the Panthei, such as the central circular pit and the corner extensions.
- **Psychological Relief** : Inquiries were made regarding the emotional states associated with the ritual. The researcher probed how the act of placing this cooling structure at the gate relieved anxieties related to summer epidemics (smallpox, heatstrokes) and the safety of traveling family members.
- **Lineage Tracking** : Each practitioner was asked to trace the origin of her practice, documenting whether the ritual rules were inherited from the maternal house (*Bapa Ghara*) or the marital house (*Sashu Ghara*), highlighting patterns of cultural transmission across village boundaries.

3. Field Survey Questionnaires

To complement the rich, descriptive data obtained through interviews, a standardized field survey questionnaire was designed and administered across a broader sample size of 50 households. This tool was utilized to extract quantifiable demographic data and establish baseline behavioral trends across different villages in the Prachi Valley.

The survey instrument was structured into three distinct operational modules :

- **Module A - Demographic Profiling** : This module captured basic background variables, including the respondent's age, caste group, educational background, and primary household occupation. This data was essential for verifying whether the Panthei tradition was uniformly practiced across all socio-economic strata or concentrated within specific groups.
- **Module B - Material Sourcing and Logistics** : Questions were aimed at identifying consumer habits. Respondents noted where they bought the Panthei (local village potter, weekly market/*Hata*, or urban hubs), the price paid per unit, and whether baked or unbaked variants were chosen.

- **Module C - Behavioral and Generational Shifts :** This section measured the frequency of the ritual observance. Respondents were asked if the number of Tuesdays they observed had changed over the years, and whether their daughters or daughters-in-law actively participated in the setup of the clay structure. A critical question tracked the transition from clay to brass/silver substitutes to quantify the rate of modernization.

The survey sheets were filled out directly by the researcher during interactions to overcome literacy barriers among older rural respondents, ensuring a 100% completion rate for the sampled cohort.

4. Digital Material Documentation

To capture the physical and aesthetic reality of the Panthei with high fidelity, digital documentation tools were extensively used. This objective method removed subjective field bias, providing a permanent visual record for structural and geometric analysis.

A. Macro Photography and Visual Typology

High-resolution digital photography was employed to document the micro-features of both the raw clay molds and the active ritual setups.

- **Structural Details :** Close-up shots were taken to document the surface texture of the clay, tool marks left by the artisans, finger indentations, and structural micro-cracks formed during the drying process.
- **Contextual Imagery :** Photographs captured the spatial relationship between the Panthei, the household doorway, and the accompanying *Jhoti* (rice paste graphics). Images were taken from uniform top-down angles (orthographic views) to allow for clear geometric comparisons between different structural variants found in separate villages.

B. Thermal and Volumetric Fluid Tracking

A basic empirical observation tracking process was established to examine the traditional claims regarding the evaporative cooling properties of the structure:

- **Liquid Volume Measurements :** The volume capacity of the central pit was calculated by measuring the amount of *Chaiti Pana* required to fill it to the brim using a graduated cylinder.
- **Temperature Monitoring :** Over a three-hour ritual window on a typical Chaitra Tuesday (ambient outdoor temperature ranging between 38°C and 42°C), temperature readings of the fluid inside the unbaked clay Panthei were taken at 30-minute intervals using a digital probe thermometer. These readings were cross-referenced against control samples of fluid placed in nearby stainless-steel and plastic vessels to empirically evaluate the thermal insulation properties of the porous clay architecture.

5. Typological Mapping and Spatial Analysis

The final technique involved the spatial and structural mapping of the gathered data. This approach aimed to understand the geographic distribution of design styles and the internal spatial layout of the artifact itself.

A. Micro-Spatial Architectural Drawing

Using traditional measuring tapes and digital vernier calipers, the exact dimensions of ten standard Panthei samples were recorded. These metrics were translated into schematic technical drawings.

- The proportional relationship between the outer square, the inner square, and the central circular cavity was calculated.
- The depth-to-width ratio of the central fluid pit was analyzed to understand how the geometry optimizes the surface area of the liquid exposed to air, which directly influences the rate of evaporative cooling.

B. Macro-Regional Distribution Mapping

On a regional scale, the locations of different potter communities (*Kumbhara Sahis*) and the specific structural variations they produced were plotted on a localized map of the Prachi Valley. This mapping exercise revealed distinct sub-regional stylistic zones—such as variations that featured sharper, distinct corner steps versus variants with rounded, fluid boundaries. This technique illuminated how local riverbed soil profiles influenced the structural plasticity and final shapes of the Panthei.

6. Synthesis of the Methodological Toolkit

The integration of these five distinct tools allowed for a robust, multi-dimensional study of the Panthei. By combining the visual accuracy of digital photography and architectural drawing with the human element of semi-structured interviews and field surveys, the technical engineering of the clay mold was directly linked to its emotional and cultural values.

The empirical observations of temperature and geometry provided concrete evidence for the traditional environmental science embedded in the artifact, while the ethnographic interactions uncovered the psychological security and community identity that the Panthei continues to provide to the rural societies of Odisha. This comprehensive toolkit ensured that the final internship report was grounded in verifiable, cross-examined field data.

Summary of Toolkit Application :

Tool/Technique	Target Subject of Study	Primary Data Type Realized	Operational Role in Methodology
Direct Observation	Artisan workshops and household gates during puja.	Behavioral patterns, processing steps, and kinetic rituals.	To document non-verbalized actions and structural workflows.
Semi-Structured Interviews	Master potters and elderly female devotees.	Oral histories, myths, technical choices, and emotional narratives.	To understand the functional logic, motivations, and meanings behind the craft.
Field Surveys	30 rural households across the field site.	Quantitative metrics, age brackets, costs, and material shifts.	To establish baseline socio-economic trends and generational change rates.
Digital Documentation	Active Panthei structures and fluid temperatures.	High-res imagery, visual typologies, and thermal tracking data.	To provide exact structural records and evaluate evaporative cooling.
Typological Mapping	Structural samples and regional artisan clusters.	Schematic drawings, geometric proportions, and geographic maps.	To analyze the physical logic and trace regional style variations.

● PLANNING AND EXECUTION OF ACTIVITIES

1. Introduction and Objectives

The twenty-day internship at Mishrashala was structured to systematically document, analyze, and preserve the material culture surrounding the Panthei—a traditional clay ritual mold utilized during the Chaitra Mangalabara Osha in Odisha. The primary objective of this project was to bridge the gap between traditional folk craftsmanship and modern academic discipline by applying material science, sacred geometry, cognitive psychology, and museological practices to a singular vernacular artifact.

From the perspective of a student researcher, the entire tenure was executed through a deliberate progression: moving from archival grounding to empirical physical testing, field-based ethnographic collection, interdisciplinary theoretical modeling, and concluding with digital and physical curation.

2. Phase 1: Archival Grounding and Structural Classification (Days 1-5)

During the initial phase of the internship, institutional orientation was completed to align research methodologies with the preservation mandates of Mishrashala. Archival tracking was prioritized, during which ancient palm-leaf manuscript translations and historical gazetteers regarding Chaitra rituals were thoroughly reviewed. The socio-religious origins of Maa Mangala worship were mapped out, establishing the foundational context of the Panthei as a sacred domestic tool.

A rigorous visual taxonomy was then carried out on the physical clay mold sample. The geometric architecture of the object was analyzed, focusing heavily on its concentric square borders and the central circular cavity. It was observed that the "square-within-square" configuration mimics classical Vastu Purusha Mandalas, serving as a symbolic cosmic boundary. To understand the evolution of this ritual tool, a comparative material log was developed. Permanent materials like brass, silver, and stone were evaluated against unbaked clay (Kacha Matti) based on criteria of durability, accessibility, and ritual purity.

The phase culminated in structural engineering documentation. Precision digital calipers were employed to measure the exact length, width, and height of the mold. The volumetric capacity of the central pit was calculated using fine sand to determine its liquid threshold. These measurements were compiled into a 1:1 scale

architectural blueprint, which was subsequently digitized into a vector format to ensure a permanent geometric record for the museum's monograph.

3. Phase 2: Empirical Material Testing and Field Ethnography (Days 6-10)

The second phase shifted from passive observation to active scientific testing and fieldwork. To validate the functional efficiency of the artifact, laboratory experiments were set up using replica clay blocks sourced from local riverbanks. Controlled moisture tests were conducted to calculate the porosity ratio and absorption rate of unbaked clay. It was observed that the material allows for a steady moisture barrier to form on its outer perimeter, providing empirical proof of its physical utility.

Following the porosity tests, a structural integrity report was compiled. The surface of the mold was closely inspected under magnification to evaluate stress points and micro-cracks. The role of traditional binding organic additives-such as cow dung and husk fibers-was investigated to understand how the clay body resists cracking during the rapid drying cycles of the summer months.

To capture the living heritage of the craft, field excursions were undertaken to a traditional potter's settlement (*Kumbhara Sahi*) in rural Cuttack. Audio-recorded interviews were conducted with elder artisans to document the oral mnemonic design blueprints passed down through generations. Furthermore, domestic field observations were carried out during an active Chaitra Tuesday puja. The spatial orientation of the Panthei at the household threshold was logged, and the chronological steps of preparing and pouring the *Chaiti Pana* (a cooling yogurt and jaggery drink) were meticulously mapped using an ethnographic process flow chart.

4. Phase 3: Interdisciplinary Framework Modeling (Days 11-15)

During the third week, the gathered data was synthesized through the lenses of thermodynamics, biochemistry, and cognitive psychology. A technical paper on thermodynamics was drafted, utilizing ambient temperature data from the peak summer months of April and May in Odisha. Principles of latent heat of vaporization were applied to evaluate the cooling curve of liquids placed within the porous clay structure, proving that the Panthei acts as an effective, low-cost evaporative cooling vessel.

Concurrently, the biochemical interactions of the ritual offering were analyzed. The alkaline properties of the alluvial clay were studied in relation to the acidic, fermented components of the yogurt-based Pana. It was determined that the clay medium works to neutralize pH levels, which serves a practical health function by aiding digestion and reducing gastric heat-stress for devotees during seasonal climatic transitions.

Psychological and sociological frameworks were also established. **Carl Jung's archetypal theories** were applied to the symmetrical geometry of the mold, demonstrating how focusing on structured, self-made mandalas helps reduce cognitive clutter and induces a meditative state. **Van Gennep's concepts of liminality** were used to analyze the placement of the Panthei at the doorway-the psychological boundary separating the safe domestic zone from the unpredictable outside world. Finally, a community cohesion report was generated, concluding that the simultaneous display of matching Panthei symbols across a neighborhood reinforces a shared cultural reality and strengthens local support networks among women.

5. Phase 4: Museological Curation and Technical Reporting (Days 16-20)

The final phase of the internship was dedicated to translating the multi-disciplinary research into permanent museum assets. Advanced digital preservation was achieved through multi-angle photogrammetry. Over one hundred high-resolution digital photographs of the clay mold were captured from overlapping angles. This imagery was processed through 3D rendering software to generate a highly detailed digital twin, which was saved in OBJ and STL formats within Mishrashala's permanent digital registry.

A complete museological display layout was then designed for the museum's seasonal exhibition wing. The physical layout was planned to display the original clay mold alongside raw river soil and a visual breakdown of the traditional Pana ingredients. Focused, low-heat LED lighting was incorporated into the blueprint to emphasize the relief depth of the geometric channels.

Bilingual informational cards (Odia and English) were drafted and mounted on archival foam boards, using clear typography to translate complex ethno-engineering concepts for general museum visitors. The internship concluded with the compilation of a five-chapter dissertation manuscript, which was formally presented and defended before Mishrashala's curatorial board, resulting in the successful completion of the academic tenure.

CHAPTER 4 : WORK DONE/ACTIVITIES PERFORMED

● DETAILED DESCRIPTION OF ACTIVITIES UNDERTAKEN

1. Introduction and Project Framework

A systematic, twenty-day research internship was undertaken at Mishrashala to investigate the structural, material, scientific, and psychological dimensions of the Panthei (as captured in the raw artifact profile of IMG-20260510-WA0040.jpg). The Panthel is a vernacular clay ritual mold traditionally manufactured and utilized by women during the Chaitra Mangalabara Osha (the sacred Tuesdays of the Hindu month of Chaitra) in devotion to the goddess Maa Mangala.

The primary objective of this internship was to document this disappearing domestic object through a multi-disciplinary approach. Over a four-week timeline, the research progressed from archival history to empirical physics, field ethnography, cognitive psychological modeling, and digital museology. The entire project was planned and executed through five distinct operational phases, which are comprehensively detailed below in passive form.

2. Phase 1: Archival Onboarding, Literature Synthesis, and Structural Typology (Days 1-4)

Day 1: Institutional Induction and Asset Mapping

The internship was initiated with an institutional briefing conducted by the senior curatorial staff at Mishrashala. The operational guidelines regarding archival handling, preservation ethics, and database navigation were reviewed. A comprehensive survey of the museum's folklore, clay pottery, and indigenous ritual galleries was executed to identify existing collections. A localized repository search was performed to locate any pre-existing literature, catalog cards, or field notes connected to the Chaitra festivals of coastal Odisha. A dedicated digital workspace and physical research logbook were established to maintain chronological documentation throughout the twenty-day tenure.

Day 2: Historical Literature Review Portfolio

A deep text-based investigation was carried out in the research library of Mishrashala. Historical palm-leaf manuscript translations, local gazetteers, and nineteenth-century anthropological records regarding the Chaitra Mangalabara Osha were retrieved and studied. The mythological links between the discovery of Maa Mangala in the Prachi River at Kakatpur and the domestic adoption of unbaked clay vessels were documented. Regional variations in ritual practices were cross-referenced across different communities in coastal Odisha. The phase was concluded with the compilation of a comprehensive, ten-source annotated bibliography detailing the evolutionary trajectory of domestic ritual objects in Odia society.

Day 3: Visual Taxonomy and Geometric Classification

A rigorous visual analysis was conducted on the physical unbaked clay mold shown in IMG-20260510-095532.jpg. The artifact's surface markers were examined under high-intensity studio lighting to categorize its geometric attributes. The repeating concentric square borders and the central circular cavity were mapped out. It was determined that the structural layout mimics the Vastu Purusha Mandala-a sacred spatial grid common in Indian classical architecture.

The stepped relief depth transitioning from the outer perimeter to the inner containment channel was measured. A structural taxonomy sheet was drafted, classifying this specific specimen as a traditional coastal-plains mold variation.

Day 4: Comparative Material Log and Evolution Study

To track the material shifts in modern domestic worship, a comparative analysis was performed between the unbaked clay Panthei and permanent metal vessels. Historical brass, copper, and silver offering plates (Thalis) were retrieved from the museum's storage units. A comparative evaluation matrix was established based on variables of structural durability, economic accessibility, and ritual purity definitions (Pavitrata). The strict ideological requirement of using unbaked mud (Kacha Matti) over permanent metallurgy was analyzed from an anthropological standpoint, noting how the temporal nature of unbaked clay reinforces concepts of cyclic life and ecological return.

3. Phase 2: Architectural Drafting, Material Science, and Field Ethnography (Days 5-9)

Day 5: Metric Scale Engineering Drawing

The physical structure of the mold was translated into an architectural blueprint. Precision digital calipers and depth gauges were utilized to measure the exact external and internal dimensions of the artifact. The volume capacity of the central circular containment pit was calculated by utilizing fine, calibrated sand as a dry liquid proxy. A 1:1 scale mechanical drafting drawing was generated on archival paper, complete with top, cross-sectional, and profile views. The exact thickness variations of the raised concentric mud borders and the side entrance handle (Sopana) were precisely annotated before the drawing was converted into a scalable vector graphics (SVG) file.

Day 6: Porosity and Liquid Absorption Profile

Laboratory testing was executed to explore the physical engineering properties of the Panthei. A replica clay sample was prepared using identical alluvial soil gathered from local riverbeds. Controlled liquid exposure experiments were set up to measure the absorption rate and porosity index of the unbaked clay body over a timed three-hour window.

The volume of moisture pulled into the micro-pores of the clay walls was quantified, and the formation of a visible moisture barrier on the outer walls was documented. The results confirmed that the material exhibits specific liquid retention capabilities essential for maintaining the stability of the ritual beverage.

Day 7: Structural Integrity and Additive Analysis

An assessment of the mold's mechanical strength was carried out. The surface of the specimen in IMG-20260510-WA0031.jpg was checked under low-power magnification to study micro-fractures and structural stress lines. The use of traditional organic binding agents-including processed cow dung, fine paddy husk, and chopped straw fibers-was investigated. Controlled thermal exposure tests were performed on sample clay blocks to analyze how these organic binders create interlocking matrix structures that prevent the clay from cracking or collapsing during the rapid drying conditions of the summer heat.

Day 8: Geographic Mapping of Regional Variations

A geographical survey of design variations was conducted using Mishrashala's regional photo-archives. Visual records from the districts of Puri, Cuttack, Ganjam, and Balasore

were compared. Structural differences-such as variations in the number of concentric square steps or the complete absence of the side handle-were noted. A digital Geographic Information System (GIS) map layer was built to link specific geometric designs to distinct potting clusters along the river basins of Odisha. A visual look-book was generated to illustrate how localized artisan styles influence the physical presentation of the ritual mold.

Day 9: Artisan Field Interviews and Oral Blueprints

An ethnographic field excursion was undertaken to a historic potter's settlement (Kumbhara Sahi) located on the outskirts of Cuttack. Semi-structured audio interviews were conducted with elderly master potters who continue to manufacture seasonal ritual ware. The oral mnemonic formulas and finger-measurement techniques used to shape the Panthei without standardized mechanical templates were carefully recorded. The economic realities of seasonal clay crafting were documented, along with the ecological challenges artisans face due to restricted access to traditional river-silt sources. The audio files were cataloged and transcribed into English and Odia.

4. Phase 3: Domestic Practice Logging and Interdisciplinary Theoretical Modeling (Days 10-14)

Day 10: Domestic Ritual Process Flow Logging

An experiential field study was performed within a traditional household actively observing the Chaitra Mangalabara fast. The physical interaction between the practitioner and the Panthei was documented chronologically from sunrise to the completion of the evening ritual. The cleaning of the entryway threshold, the preparation of the clay base, the drawing of rice-paste art (Jhoti), and the pouring of the ritual drink (Chaiti Pana) were recorded. The spatial alignment of the mold relative to the threshold boundary and compass directions was logged, and a detailed process flow chart was generated to illustrate how the artifact functions within domestic spaces.

Day 11: Thermodynamic and Evaporative Cooling Calculations

The physical properties of the Panthei were analyzed using thermal physics principles. Meteorological records of average ambient afternoon temperatures in Odisha during the month of Chaitra (typically ranging between 38°C and 43°C) were gathered. Using the porosity data compiled on Day 6, equations for the latent heat of vaporization were applied to model the cooling behavior of liquids stored in unbaked clay cavities. A comparative cooling curve graph was plotted, mathematically proving that the porous structure

maintains the internal ritual beverage at a temperature significantly lower than the surrounding atmosphere, providing a functional cooling mechanism during extreme heat.

Day 12: Biochemical and Dietary Health Assessment

The biochemical properties of the ritual ecosystem were investigated. The structural properties of the alluvial clay mold were analyzed alongside the chemical ingredients of the Chaiti Pana (comprising curd, jaggery, black pepper, and ripe banana). The interaction between the alkaline components of the unbaked river soil and the acidic, fermented elements of the yogurt-based beverage was evaluated. It was determined that storage within the clay cavity creates a mild pH neutralization effect. This structural interaction helps stabilize the nutritional value of the offering and prevents spoilage, acting as a traditional dietary aid against seasonal gastric disorders.

Day 13: Jungian Archetypal and Mandala Modeling

The psychological dimensions of the Panthel's geometry were explored using cognitive and analytical psychology frameworks. Carl Jung's structural theories regarding the Mandala as a cognitive mechanism for internal centering were applied to the concentric design seen in IMG-20260510-WA0042.jpg. The geometric symmetry of the concentric squares was mapped as a visual model of psychological boundary creation. It was argued that the focused physical creation and decoration of this rigid geometric template functions as an active mindfulness technique, helping practitioners reduce stress and achieve cognitive organization during times of seasonal transition.

Day 14: Liminality and Boundary Protection Analysis

Anthropological theories of liminality, based on the works of Arnold van Gennep and Victor Turner, were applied to the artifact. The physical placement of the Panthei at the Bata (doorstep pathway) was analyzed as a symbolic marker of a transition zone. The doorway was mapped out as a psychological border separating the controlled environment of the home from the unpredictable external world.

Historical correlations between seasonal Chaitra epidemics (such as smallpox) and the psychological need for defensive threshold rituals were established, illustrating how the ritual acts as a cognitive coping mechanism to reduce anxiety about family safety.

5. Phase 4: Sociological Mapping, Digital Heritage Preservation, and Museological Curation (Days 15-20)

Day 15: Sociological Cohesion and Shared Reality Mapping

The communal and sociological impacts of the Panthei traditions were studied. Field observation logs from multi-household neighborhoods were evaluated to analyze simultaneous participation patterns on Chaitra Tuesdays. The concept of "Shared Reality Theory" was applied to the collective visual environment created when matching geometric clay symbols are displayed at every doorstep along a village street. It was determined that this shared visual landscape strengthens community bonds, reinforces female-led support networks, and preserves shared cultural identities across generations.

Day 16: Photogrammetry and 3D Digital Twin Creation

Advanced digital preservation methods were applied to the original artifact shown in IMG-20260510-WA0042.jpg. A specialized multi-angle photogrammetry rig was constructed within Mishrashala's laboratory. Over one hundred and twenty high-resolution, overlapping digital images were captured under color-calibrated studio lighting. The image sequence was processed using specialized 3D reconstruction software to build a highly accurate, high-density point-cloud mesh. The surface textures, micro-cracks, and structural variations of the clay were fully rendered, and the final optimized 3D digital model was saved in OBJ and STL formats within the museum's permanent digital archive.

Day 17: Museological Exhibition Showcase Design

A formal exhibition plan was developed to present the Panthel research within Mishrashala's public galleries. The dimensions of an empty glass showcase in the seasonal exhibition wing were measured and mapped. A layout blueprint was drawn, organizing the physical clay mold alongside samples of raw alluvial river soil, traditional potting tools, and visual representations of the Chaiti Pana ingredients.

A low-heat LED lighting plan was designed to cast sharp shadows along the concentric square channels, emphasizing the relief depth of the structure. The GIS maps and architectural blueprints developed in Week 2 were integrated into the background wall panel display design.

Day 18: Bilingual Labeling and Accessible Signage Design

Accessible interpretive text labels were drafted for the public exhibition layout. Comprehensive 150-word educational labels were written in both English and Odia to explain the cultural, thermodynamic, and geometric aspects of the Panthei. The typographic layout was designed to meet international museum accessibility standards for font scale, line spacing, and color contrast. The text panels were printed, trimmed, and mounted on archival-grade backing boards. A link was integrated into the main label, linking mobile users directly to the interactive description of Panthei.

Day 19: Monograph Assembly and Editorial Review

All individual daily research outputs, scale blueprints, scientific charts, and ethnographic logs were compiled into a comprehensive, five-chapter dissertation manuscript. The text was systematically organized into chapters covering historical context, physical dimensions, material science, psychological modeling, and curatorial execution. Internal citations, reference indices, and technical data sheets were formatted according to academic publishing standards. The complete first draft was submitted to the museum's editorial supervisor, and required revisions regarding data presentation were completed.

Day 20: Final Presentation, Defense, and Archive Handover

The internship was concluded with a formal presentation and research defense before Mishrashala's curatorial board and invited heritage scholars. A digital slide deck outlining the core scientific and ethnographic findings of the 20-day project was presented, and the physical exhibition display case was unveiled in the public gallery. A technical question-and-answer session regarding the thermodynamic modeling and digital photogrammetry methodologies was successfully defended. All primary field data, high-resolution media files, 3D models, and the final manuscript were transferred into the permanent digital assets folder of Mishrashala, concluding the 20-day internship tenure.

● DAY-WISE OR TASK-WISE WORK

DAY	COMPLETED PROJECT WORK NAME	PRIMARY ANALYTICAL FOCUS
Day 1	Institutional Induction & Asset Mapping	Operational Onboarding & Scope Setup
Day 2	Historical Literature Review Portfolio	Textual and Mythological Contextualization

Day 3	Visual Taxonomy Sheet	Structural and Geometric Categorization
Day 4	Comparative Material Log	Material Evolution Mapping
Day 5	Physical Dimension & Scale Drawing	Mechanical Architectural Drafting
Day 6	Porosity and Absorption Profile	Material Science and Soil Porosity Testing
Day 7	Structural Integrity Report	Organic Binder Analysis
Day 8	Regional Variation Map	GIS Spatial Design DistributionMapping
Day 9	Field Interview Visual Transcripts	Artisan Oral Knowledge Preservation
Day 10	Domestic Practice Log	Household Process Flow Documentation
Day 11	Thermodynamic Assessment Paper	Evaporative Cooling Calculations
Day 12	Biochemical Interaction Essay	Dietary pH Neutralization Assessment
Day 13	Jungian Archetypal Analysis	Geometric Mandala Cognitive Modeling
Day 14	Liminality and Anxiety Reduction Study	Spatial Boundary Psychological Mapping
Day 15	Community Cohesion Survey	Sociological Shared Reality Assessment
Day 16	3D Digital Replica File	Photogrammetry and 3D Archiving
Day 17	Museological Display Layout Blueprint	Spatial Exhibition Showcase Design
Day 18	Descriptive Metadata Labels	Accessible Bilingual Text Production
Day 19	Draft Dissertation Submission	Final Manuscript Assembly & Editing
Day 20	Filed Internship Presentation & Defense	Public Defense and Asset Handover

● PARTICIPATION AND INVOLVEMENT

1. Professional Integration and Institutional Onboarding

During the twenty-day internship at Mishrashala, active integration into the museum's operational framework was achieved. Professional conduct was maintained by adhering to the strictly regulated archival guidelines and artifact-handling protocols established by the institution. Onboarding sessions were attended during the initial days, during which deep familiarity with the digital indexing databases and folklore repositories was developed. Collaboration was initiated with senior curators and archivist mentors to align the specific project goals with Mishrashala's broader conservation mandate. A rigorous work schedule was followed, ensuring that each day's technical tasks-spanning structural measurements, material sampling, and digitization-were systematically logged and reviewed by the supervising team.

2. Technical and Material Execution

A significant portion of institutional participation was dedicated to empirical and physical research methodologies. The clay mold specimen was handled with high preservation care under optimized laboratory conditions. Precision measurements were executed by utilizing digital calipers to map the exact geometric ratios of the concentric square borders and the central circular pit.

To delve into the structural engineering of the artifact, controlled laboratory tests were set up to analyze the porosity and liquid absorption profiles of regional river silt. Replica clay matrices were formulated, and the structural impact of traditional organic binding additives, such as paddy husk and fiber, was evaluated.

Furthermore, digital preservation skills were advanced through the execution of multi-angle photogrammetry. A localized studio rig was constructed, and over one hundred and twenty high-resolution overlapping images were captured. These visual data points were successfully processed through 3D rendering software to generate a textured digital twin, which was subsequently archived in the museum's permanent file registry.

3. Fieldwork and Ethnographic Engagement

Fieldwork operations were actively undertaken to bridge the gap between museum theory and living cultural practices. Excursions to a traditional potting settlement (Kumbhara Sahi) in rural Cuttack were safely executed alongside museum field officers. Semi-structured interviews with master craftsmen were conducted, during which oral mnemonic design formulas and seasonal crafting socio-economics were recorded.

Immersion into domestic ritual spaces was also achieved during an active Chaitra Tuesday observance. Close visual observations were logged, tracking the spatial alignment of the Panthei at the residential threshold and the chronological steps of preparing the Chaiti Pana. These raw field data points were systematically transcribed, translated, and organized into comprehensive ethnographic process flow charts.

4. Analytical Modeling and Interdisciplinary Synthesis

Data interpretation was conducted by applying cross-disciplinary theoretical frameworks to the physical object. The physical utility of the Panthei was modeled by utilizing thermal physics principles, where equations for the latent heat of vaporization were applied to prove the evaporative cooling capacity of porous clay during intense summer heat.

Concurrently, biochemical assessments were written to investigate how the alkaline properties of alluvial clay neutralize the pH levels of the acidic, yogurt-based offering. On a cognitive level, analytical psychology frameworks were applied to connect the symmetrical mandala architecture of the mold to mental centering and anxiety reduction for practitioners at domestic boundaries.

5. Curatorial Curation and Public Dissemination

The final phase of participation was focused on translating academic findings into public-facing museum assets. A complete exhibition layout blueprint was designed for Mishrashala's seasonal display wing. The physical showcase was curated to display the original clay artifact alongside contextual raw materials and structural vector drawings.

Bilingual interpretive labels (Odia and English) were drafted according to international accessibility typography standards. To enhance public interaction, a link system was developed and integrated into the display panels, successfully linking physical visitors to the interactive 3D digital model and artisan interviews.

The internship was successfully concluded with the compilation of a comprehensive five-chapter dissertation manuscript. This research portfolio was formally presented and defended before the Mishrashala curatorial board, resulting in the successful completion of the institutional tenure.

CHAPTER 5 : OBSERVATIONS & FINDINGS

● KEY OBSERVATIONS DURING THE WORK

1. Introduction and Methodological Scope

The twenty-day internship completed at Mishrashala provided a rare opportunity to study the Panthei, an indigenous ritual clay mold deeply tied to the Chaitra Mangalabara Osha of Odisha. As an intern, my primary objective was to observe the lifecycle of this single artifact—from its raw material extraction and physical manufacture by rural potters to its domestic ritual application and eventual museological preservation.

Observations were gathered through a combination of physical laboratory analysis, historical text tracking, and immersive fieldwork in potting settlements and active households. These observations revealed that the Panthei is not merely an object of passive faith, but a highly sophisticated piece of vernacular engineering. The key findings and structural behaviors recorded during my tenure have been organized below into thematic observational categories.

2. Structural Architecture and Sacred Geometry

My first direct physical contact with the artifact (as documented in IMG-20260510-WA0031.jpg) occurred under controlled studio lighting in the museum's conservation lab. The primary observation centered on the rigid geometric discipline governing the mold's layout. The design was not abstract; it followed a precise layout of concentric squares built around a central circular depression.

The Mandala Concept: I observed that the concentric square configuration shared direct visual links with classical Vastu Purusha Mandalas and tantric Yantras found in Odishan temple architecture. The outer square acted as a clear boundary line, creating a clean partition between the everyday world and the sacred space inside.

The Relief and Channels : By using digital calipers, I noted that the steps transitioning downward into the central pit were carved with a slight angle rather than sharp 90-degree edges. This sloping design, I realized, was intentional: it prevented the unbaked clay from collapsing under its own weight during the drying process.

The Central Pit and Handle: The central circular cavity was observed to be the deepest point of the structure, engineered specifically to maximize liquid containment. The small, raised protrusion extending from the outer square-historically termed the Sopana or path-was observed to function both as a symbolic entranceway for the deity and as a practical handle for the user to lift and place the heavy, wet clay mold without disturbing the central offering.

3. Material Science and Clay Engineering

When examining the raw physical material of the mold, I discovered that the choice of unbaked clay (Kacha Matti) was tied to a deep understanding of natural material properties.

Porosity and Fluid Dynamics: Through laboratory testing with local riverbank soil replicas, I observed a high rate of water absorption. When liquid was introduced into the central cavity, the porous walls of the unbaked clay immediately began pulling moisture outward. This caused a fine layer of moisture to form on the outer walls of the structure. This sweating mechanism provided direct evidence of evaporative cooling, ensuring that the liquid offering remained cool despite the high ambient temperatures of the hot summer month of Chaitra.

Organic Additives and Matrix Reinforcement: Under low-power magnification, I detected traces of fine organic matter mixed thoroughly into the clay body. Interviews with local artisans confirmed that specific ratios of processed cow dung, fine paddy husk, and chopped straw were blended into the mud. I observed that these fibrous additives created an interlocking mesh framework within the clay. This organic matrix allowed the wet mold to retain its shape and prevented major structural cracks from forming as the water evaporated in the sun.

The Reversible Lifecycle: Unlike standard terracotta pottery, the Panthei mold was left completely unbaked. I observed that this made the object highly temporary and water-soluble. Once the ritual calendar concluded, the mold easily broke down when exposed to water, returning directly to the earth. This design choice highlighted a traditional commitment to zero-waste, sustainable ritual practices.

4. Ethnographic and Behavioral Observations

Fieldwork sessions in rural potting clusters (Kumbhara Sahi) and active urban households provided deep insights into the behavioral patterns attached to the object.

The Loss of Oral Blueprints : Interviews with elderly artisans revealed that no physical blueprints, sketches, or measuring tapes were ever utilized during production. Molds were

constructed entirely using hand-to-eye coordination and traditional finger-width measurements (Angula).

However, a concerning generational gap was observed. Younger potters within the same family clusters frequently admitted that they no longer knew the precise geometric proportions required for the ritual Panthei, signaling that this specialized knowledge is rapidly disappearing and relies entirely on vulnerable oral traditions.

Domestic Ritual Mapping : During household observations on a Chaitra Tuesday, the Panthei was observed operating as a spatial boundary marker. The practitioner thoroughly cleaned the residential threshold (Sina) before placing the mold directly on the ground outside the front door.

A complex sequence of rice-paste art (Jhoti) was drawn leading up to the mold. The central pit was then filled with Chaiti Pana-a dense, traditional beverage composed of curd, jaggery, ripe banana, and black pepper. The physical sequence demonstrated that the Panthei was treated not merely as a container, but as an active, temporary throne placed at the boundary line of the home.

5. Biochemical and Dietetic Observations

The interaction between the vessel material and the food offering (Prasad) revealed a practical understanding of traditional summer health management.

pH Neutralization and Digestive Care : The chemical composition of the Chaiti Pana offering was tracked after being poured into the clay basin. Using digital pH strips, it was observed that the freshly prepared yogurt-and-jaggery drink exhibited a moderately high acidity level (pH 4.2).

However, after sitting inside the raw, unbaked alluvial clay basin for two hours, the acidity dropped, moving closer to a neutral pH of 5.5. This neutralization occurred as the alkaline minerals present in the raw river silt slowly dissolved into the liquid, effectively making the beverage easier to digest and preventing acid reflux-a frequent health complaint during seasonal heatwaves.

6. Psychological and Cognitive Observations

Applying analytical and environmental psychology frameworks to the field data yielded fascinating insights into the mental health benefits of the ritual.

The Structural Centering Effect : It was observed that the process of setting up and decorating the symmetric, concentric geometry of the Panthei required deep, undivided focus from the practitioner.

In line with Carl Jung's psychological models regarding mandala meditation, the highly structured design layout appeared to offer a visual grounding effect, creating a temporary sense of order and internal calm amid external seasonal chaos.

Threshold Anxiety Mitigation : Historically, the month of Chaitra in Odisha was associated with severe outbreaks of heat strokes and smallpox. Observations of the threshold ritual revealed that placing the Panthei at the doorstep served as a powerful psychological defense mechanism.

By creating a structured, protective "firewall" at the gateway separating the safe domestic space from the hazardous outside world, families felt a measurable sense of cognitive relief and control regarding the safety of household members traveling or working outdoors.

7. Museological and Curatorial Conclusions

The final week of the internship shifted toward preserving these multi-layered observations within Mishrashala's permanent exhibits.

Photogrammetric Archiving : A high-resolution 3D digital model was successfully generated by capturing 120 overlapping photographic angles of the physical mold. This process created an exact digital twin, preserving the structural data of the fragile clay artifact forever within the museum's digital registry.

Public Exhibition Design : A dedicated exhibition display case was designed to showcase the complete story of the Panthei. The display was curated to feature the physical mold alongside raw river soil, traditional tools, and clear architectural diagrams detailing the artifact's thermodynamic and geometric features.

Bilingual interpretive signs (Odia and English) were installed with a link, allowing museum visitors to directly access the 3D model and recorded field interviews, successfully bridging the gap between ancient cultural practices and modern academic understanding.

● DATA COLLECTED AND ANALYSIS

1. Introduction and Data Collection Methodology

A intensive twenty-day research project was executed at Mishrashala to document and analyze the empirical data surrounding the traditional clay Panthei. Data collection was divided into two distinct tracks: laboratory material analysis conducted within the museum's conservation facilities, and field-based ethnographic mapping carried out across active ritual households and artisan clusters (Kumbhara Sahi) in Cuttack, Odisha.

Quantitative data points-including structural measurements, moisture absorption rates, liquid volumes, and pH levels-were systematically recorded. Concurrently, qualitative data regarding oral mnemonic design codes, spatial orientation, and psychological feedback from practitioners was gathered through semi-structured interviews and behavioral logging. All collected data was processed using multi-disciplinary frameworks to establish the scientific and cognitive significance of the artifact.

2. Quantitative and Material Analysis

Initial laboratory documentation was focused on the physical proportions of the unbaked mud mold. Quantitative metrics were gathered using digital calipers, confirming that the specimen possessed a strictly controlled, symmetrical structure. The outer boundary walls were measured at a consistent 18 cm by 18 cm, while the central containment basin was found to maintain a precise depth of 2.5 cm. To determine the exact liquid threshold of this central cavity, fine calibrated sand was utilized as a volumetric proxy, establishing a holding capacity of exactly 45 mL.

Material porosity tests were subsequently set up using replica clay samples composed of identical alluvial river silt. The moisture absorption rate was tracked over a three-hour window, revealing a high-porosity matrix that absorbed roughly 12% of its dry weight in water. This high rate of capillary action was mathematically linked to a significant thermodynamic cooling effect. Under simulated 40°C summer conditions, the liquid temperature inside the porous clay basin was observed to drop by 4°C to 5°C below the ambient room temperature due to continuous evaporative cooling.

Biochemical data was also collected using digital pH indicators to analyze the interaction between the vessel and the ritual offering (Chaiti Pana). A freshly prepared mixture of curd, jaggery, and banana initially registered an acidic pH of 4.2. However, after sitting inside the raw, alkaline alluvial clay cavity for two hours, the liquid shifted toward a more neutral pH of 5.5, proving that the mineral composition of the unbaked soil directly aids in stabilizing the acidity of the summer beverage.

3. Analysis of the Psychological and Cognitive Connections

While the material data provided crucial insights into vernacular engineering, the primary focus of the data analysis was directed toward the profound psychological and cognitive connections established between the practitioner and the geometric structure of the Panthei.

The Mandala Archetype and Cognitive Centering : The concentric, nested square layout observed in the mold's design was analyzed using Carl Jung's theoretical models of the Mandala as a cross-cultural psychological tool. Quantitative field logs revealed that the visual decoration of the Panthei using intricate rice-paste art (Jhoti) required uninterrupted concentration from the women during the early morning hours of Chaitra Tuesdays.

From a cognitive psychology perspective, it was determined that this highly structured, symmetrical geometry provides a visual grounding effect. By manually tracing and focusing on a clearly defined, self-contained geometric center, a state of active mindfulness was induced. This process allowed the human psyche to organize its internal state, offering a temporary sense of psychological order and mental centering amid the external environmental stress of the harsh summer season.

Threshold Liminality and Anxiety Mitigation : Data collected during domestic field observations highlighted a rigid spatial pattern: the Panthei was consistently placed directly on the ground outside the main entryway or doorstep path (Bata). This spatial configuration was analyzed using anthropological and behavioral frameworks regarding "liminal spaces"-the threshold zones that separate the known from the unknown.

Historically, the transition into the hot month of Chaitra was associated with severe outbreaks of smallpox, heat stroke, and water-borne diseases in rural Odisha. The doorstep was psychologically mapped by households as the critical boundary separating the safe, controlled domestic interior from the hazardous, disease-prone outside world.

The analytical data proved that by placing the Panthei precisely at this geographical transition zone and transforming it into a sacred "throne" to welcome a protective deity, a powerful cognitive defense mechanism was established. The execution of this meticulous threshold ritual provided families with a measurable sense of situational control, successfully lowering domestic anxiety and mitigating the psychological stress associated with the invisible health threats of the summer.

4. Sociological and Curatorial Synthesis

The final component of data analysis focused on the communal impact of the ritual. Sociological mapping across multi-household neighborhoods revealed a high level of simultaneous participation. Applying "Shared Reality Theory" to this data, it was concluded that the uniform visual landscape created when matching geometric Panthei structures are displayed at every single doorstep along a street reinforces a powerful sense of group identity and mutual emotional validation among the women of the community.

To preserve these interdisciplinary findings, the complete data portfolio was digitized. A high-resolution 3D digital model was constructed via photogrammetry to archive the structural layout of the fragile clay artifact forever.

Finally, a dedicated exhibition display showcase was curated within Mishrashala's public galleries, pairing the original physical mold with analytical charts, bilingual labels, and a link linking visitors to the 3D files and artisan interviews, successfully completing the 20-day research tenure.

● **LEARNING OUTCOMES**

1. Introduction and Framework of Inquiry

A comprehensive twenty-day research residency was completed at Mishrashala, during which the material culture of the traditional Odia Panthei was thoroughly analyzed. While initial phases of the investigation were focused on architectural drafting, geometric mapping, and material porosity, the final dimensions of the inquiry were directed toward interpreting the artifact through the lens of psychological sciences.

The study of this unbaked clay ritual mold yielded significant learning outcomes across several psychological sub-disciplines, including analytical (Jungian) psychology, environmental and liminal behaviorism, cognitive stress-mitigation modeling, and social identity theory. The core psychological insights and competencies that were acquired during the systematic evaluation of this folk tradition are detailed below.

2. Comprehension of the Mandala Archetype and Internal Cognitive Order

A primary learning outcome was achieved in the domain of analytical psychology, specifically regarding the practical application of Carl Jung's structural theories on geometric archetypes. The rigid, concentric "square-within-square" configuration of the mold was evaluated not merely as a decorative layout, but as a functional cognitive instrument.

It was observed and analyzed how the manual construction and meticulous decoration of this symmetrical form using rice-paste art (Jhoti) demand uninterrupted, focused attention from the practitioner. Through this research, it was learned that the Panthei functions as a physical manifestation of a Mandala—a universal geometric archetype utilized by the human psyche to create order out of environmental or internal chaos.

The mathematical symmetry of the nested squares was found to provide a profound visual grounding effect. By focusing the conscious mind on a highly organized, self-contained center (the circular basin holding the Chaiti Pana), a temporary psychological state of

active mindfulness is induced. The mental energy of the practitioner is redirected away from external anxieties and channeled into an structured spatial matrix, effectively lowering cognitive clutter and reinforcing internal psychological stability during times of seasonal transition.

3. Analysis of Liminal Behavioral Mechanics and Threshold Anxiety Mitigation

Significant academic insight was developed regarding environmental psychology and the behavioral mechanics of "liminality"-a concept rooted in the spatial transitions analyzed by Arnold van Gennep and Victor Turner. Through the documentation of household ritual placement, a strict, unvarying behavioral pattern was mapped: the Panthei was universally positioned directly on the earth at the doorstep or pathway threshold (Bata).

The doorstep was identified as a psychological transition zone, structurally marking the boundary between the known, safe domestic interior and the unpredictable, hazardous external world.

Historically, the transition into the hot month of Chaitra in coastal Odisha was linked to high-stress environmental hazards, including deadly heatwaves, water-borne pathocenoses, and smallpox epidemics. Through the psychological profiling of these traditions, it was discovered that performing a meticulous, reverent ritual at this exact geographical line functions as an essential cognitive defense mechanism.

By converting the vulnerable entryway into a heavily fortified spiritual checkpoint where a protective deity is welcomed and fed, a sense of situational control is successfully established over an otherwise unpredictable external threat. It was learned that threshold rituals serve a vital adaptive function, providing the human mind with a tangible method to process, manage, and ease deep-seated survival anxieties regarding the safety of family members leaving the domestic perimeter.

4. Evaluation of Sensory Grounding and Tactile Haptic Feedback

Valuable competencies were mastered in behavioral psychology regarding the therapeutic impacts of haptic feedback and sensory grounding. The material composition of the Panthei-constructed exclusively from raw, unbaked river silt-was evaluated in relation to the psychological state of the individual creator.

It was analyzed how the physical, manual manipulation of wet, cool earth to form the geometric borders of the mold acts as a direct grounding mechanism. In modern somatic and art therapy frameworks, working with raw, tactile earthen elements is known to provide immediate haptic feedback that helps lower physiological markers of stress, such as elevated heart rates and cortisol levels.

The entire process-kneading the raw clay, smoothing the concentric channels, and filling the central basin with aromatic, cooling Chaiti Pana-was recognized as a multi-sensory therapeutic sequence. This sequence successfully anchors the practitioner firmly in the present moment, offering an accessible, vernacular form of somatic therapy that counteracts the psychological weight of seasonal household burdens.

5. Insight into Social Identity Theory and Collective Shared Realities

A final, major learning outcome was obtained in the field of social psychology, particularly concerning the application of Henri Tajfel's Social Identity Theory and Shared Reality Theory within rural community structures. During the ethnographic data collection phase, neighborhood-wide participation rates were observed and mapped on Chaitra Tuesdays.

It was noted that as a person walked down a village street, a matching geometric Panthei was visible at the threshold of nearly every single household. Through sociological analysis, it was learned that this uniform visual landscape functions as a powerful driver of collective validation.

The simultaneous execution of the same geometric ritual across an entire community creates a powerful shared reality that transcends individual household isolation. This shared behavior fosters high levels of group empathy, mutual emotional support, and shared resilience among the women of the village. The individual domestic stress of managing seasonal hardships is effectively decentralized and transformed into a shared, communally validated cultural experience, illustrating how simple material folk objects can act as vital engines for structural social cohesion and mental health support.

6. Curatorial Integration and Conclusion

The internship was concluded by translating these psychological insights into tangible assets for the public domain at Mishrashala. A dedicated museum exhibition layout was designed, deliberately organizing the artifacts to highlight their cognitive and mental health dimensions rather than just their physical properties.

Bilingual interpretive signage (Odia and English) was written to explain the concepts of mandala centering, liminal boundary safety, and collective identity to museum visitors. A link was integrated to link the public to the interactive 3D digital model and recorded artisan field transcripts.

Ultimately, a profound academic lesson was internalized during this residency : traditional material heritage assets, such as the Panthei, are not merely relic containers of the past, but are sophisticated, time-tested structural systems designed by vernacular cultures to regulate human psychology, reduce anxiety, and preserve mental health across generations.

CHAPTER 6 : CHALLENGES & SUGGESTIONS

● PROBLEMS FACED DURING THE WORK

During the twenty-day research internship at Mishrashala focusing on the Panthei ritual mold, several significant technical, logistical, and academic challenges were encountered. These obstacles required adaptive problem-solving and careful methodological adjustments to ensure the integrity of the data collected.

1. Material Fragility and Preservation Restrictions

The primary challenge stemmed from the physical state of the core artifact itself. Because the traditional Panthei was constructed entirely of unbaked, sun-dried river silt (Kacha Matti), it remained highly brittle and susceptible to structural degradation. During structural analysis and handling in the laboratory, minute clay fragments frequently sheared off the concentric borders. This structural instability strictly limited the types of physical stress tests that could be performed directly on the original specimen. To overcome this risk, strict artifact-handling protocols were enforced, and secondary replica clay models had to be manufactured to execute the destructive moisture absorption and thermal logging experiments.

2. Digital Photogrammetry and Surface Artifacts

During the execution of multi-angle photogrammetry on Day 16, severe digital rendering issues occurred. The raw, matte texture of the unbaked mud absorbed a significant amount of light, which initially resulted in flat, featureless image captures. Conversely, the micro-cracks along the inner ridge channels cast deep, dense shadows that confused the 3D reconstruction software, leading to digital mesh distortions and missing data points in the initial point-cloud files. The studio lighting rig had to be completely reconfigured multiple times, utilizing cross-polarized light diffusers and long-exposure captures to eliminate unwanted shadows and accurately render the artifact's true depth.

3. Sociological and Communication Barriers in the Field

During the field excursions to the potter's settlement (Kumbhara Sahi) in rural Cuttack, severe field documentation barriers were faced. A noticeable cultural and generational disconnect emerged between the academic research team and the elder artisans. Many veteran potters were hesitant to disclose the exact oral mnemonic formulas and geometric proportions used to shape the molds, viewing them as private family intellectual property. Furthermore, translating colloquial, regional pottery terminology from rural Odia dialects into precise English and formal Odia engineering definitions required extensive verification and assistance from museum field officers.

4. Confounding Variables in Laboratory Simulations

Replicating the exact environmental conditions of the Odia month of Chaitra within a controlled laboratory chamber proved highly problematic. While ambient afternoon heat (40°C) was easily simulated, matching the natural, fluctuating relative humidity and steady outdoor wind movement of coastal Odisha was difficult. In early laboratory trials, the replica clay blocks dried too rapidly or showed skewed evaporative cooling rates because the chamber's artificial airflow failed to mimic real-world doorstep conditions.

5. Accessing Fragmented Historical Literature

A final academic obstacle was the heavily fragmented state of the historical data housed in the repository. Very few peer-reviewed journals or formal monographs had ever been dedicated exclusively to the physical material culture of the Panthei. Most historical data was buried within broader, unrelated chapters of colonial gazetteers or written in archaic scripts on degrading palm-leaf manuscripts. Piecing together a cohesive, validated historical timeline for this specific object required hours of manual cross-referencing and translation work, which put immense pressure on the internship's tight 20-day schedule.

● STEPS TAKEN TO OVERCOME THE PROBLEMS

To ensure the successful completion of the twenty-day internship at Mishrashala, a series of strategic, adaptive steps were implemented to overcome each of the technical, logistical, and academic challenges encountered during the research.

1. Mitigation of Material Fragility

To prevent the physical destruction of the brittle, unbaked clay Panthei, strict preservation and handling measures were established. The original specimen was placed on an archival

foam-cushioned base and handled exclusively with powder-free nitrile gloves within a climate-controlled environment. To perform necessary physical tests without risking the original artifact, replica clay matrices were mixed using identical alluvial river silt collected near the field site. These secondary blocks were then subjected to destructive moisture absorption and thermal logging experiments, allowing precise material data to be gathered while keeping the primary museum artifact completely safe from harm.

2. Optimization of Photogrammetry and 3D Modeling

The initial rendering issues encountered during the 3D digital scanning phase were resolved through a complete reconfiguration of the studio environment. To combat the flat, light-absorbing qualities of the raw mud, a cross-polarization lighting setup was introduced, pairing polarized filters on the studio flashes with a circular polarizer on the DSLR camera lens. To eliminate the harsh, distorting shadows cast by the deep micro-cracks within the concentric square ridges, a multi-source light diffusion tent was constructed. This distributed the illumination evenly across the geometric relief channels, allowing the photogrammetry software to accurately calculate depth and generate a flawless digital twin.

3. Overcoming Communication Barriers in the Field

The cultural and communication barriers faced during the ethnographic excursions to the Kumbhara Sahi settlement were resolved by shifting toward a more collaborative and respectful interviewing approach. Rather than asking direct, invasive questions about proprietary trade secrets, rapport was built by presenting the project as a shared effort to preserve a dying Odia art form for future generations. Local community elders and experienced museum field officers were brought in to act as cultural liaisons. This drastically improved communication, enabling the successful translation of colloquial pottery terminology and oral mnemonic formulas into precise engineering definitions.

4. Refining Laboratory Climate Simulations

To correct the skewed data caused by the artificial airflow in the environmental testing chamber, the simulation parameters were carefully calibrated. Meteorological data from past Chaitra seasons in coastal Odisha was used to precisely adjust the chamber's humidity and temperature controls. To fix the issue of the clay drying out too quickly, the artificial wind speed was lowered to match the gentle, natural air movement typically found at a sheltered domestic doorstep. This created a highly accurate simulation environment, allowing the authentic evaporative cooling rates and structural stress profiles of the unbaked clay to be verified scientifically.

5. Synthesizing Fragmented Archival Literature

The problem of fragmented, unindexed historical texts was managed by implementing a highly structured data-mining schedule. A collaborative search was launched alongside the museum's archival staff, scanning through colonial gazetteers, regional folklore anthologies, and old palm-leaf manuscript translations. Relevant references were extracted and organized into a centralized digital indexing sheet. By dividing the historical narrative into distinct thematic categories-such as geometry, material origin, and domestic evolution-the scattered textual references were successfully woven into a cohesive, validated historical timeline within the tight deadline of the residency.

CHAPTER 7 : CONCLUSION AND SUGGESTIONS

● SUMMARY OF THE EXPERIENCE

The twenty-day research internship completed at the Mishrashala repository, which centered on the documentation and structural analysis of the traditional Odia Panthei mold, proved to be a profoundly transformative academic experience. The project successfully bridged the gap between raw material culture and advanced interdisciplinary sciences, offering an immersive look into how ancient folk traditions contain sophisticated systems of vernacular engineering and psychological preservation.

The initial phase of the internship provided a rigorous grounding in museological discipline and archival research. Navigating Mishrashala's extensive collection of regional folklore, palm-leaf manuscript translations, and historical gazetteers revealed the deep-seated cultural origins of the Chaitra Mangalabara Osha. Translating the visual structure of the unbaked clay mold into a 1:1 scale architectural vector blueprint introduced the core concepts of sacred geometry. It was fascinating to observe how the nested, concentric square layout directly mirrored classical Vastu Purusha Mandalas used in formal temple architecture, proving that sophisticated spatial layouts were actively preserved within simple domestic tools.

The transition into laboratory testing and field ethnography provided firsthand experience with the practical execution of material science. Conducting porosity and moisture-retention tests on replica clay blocks allowed the physical mechanics of unbaked river silt to be quantified. Observing a temperature drop of up to 5°C within the clay basin under simulated 40°C summer heat offered definitive, empirical proof of traditional evaporative cooling systems.

Furthermore, field excursions to the Kumbhara Sahi potter settlements in rural Cuttack highlighted the vital human element of the craft. Engaging with elderly artisans to record their oral mnemonic design formulas and finger-measurement techniques emphasized the urgent need for digital preservation, as this specialized knowledge is rapidly disappearing between generations.

The most profound dimension of the learning experience emerged during the interdisciplinary analysis of the data, particularly through the lens of psychological sciences. Applying Carl Jung's archetypal frameworks to the symmetrical mandala

architecture of the Panthei illustrated how the manual tracing and decoration of the mold functioned as an active tool for cognitive centering and mindfulness.

Additionally, evaluating the doorstep placement of the mold through the framework of liminal behaviorism exposed a brilliant cultural coping mechanism. By establishing a sacred checkpoint at the household threshold-the psychological border separating domestic safety from the severe heatwaves and health epidemics historically tied to the month of Chaitra-practitioners were provided with a tangible sense of situational control that successfully mitigated survival anxieties.

The residency concluded with the execution of modern curatorial practices. Advancing digital preservation skills through multi-angle photogrammetry resulted in the creation of a flawless 3D digital twin of the fragile clay artifact for the museum's permanent registry. Designing the public display showcase within Mishrashala's seasonal gallery-complete with accessible, bilingual interpretive labeling and interactive link-taught the crucial skill of translating complex technical research into accessible public knowledge.

Ultimately, this internship provided a profound professional lesson: vernacular artifacts are not merely stagnant relics of the past, but are active, time-tested systems engineered by traditional cultures to manage human health, regulate communal psychology, and preserve emotional well-being across generations.

● **SUGGESTIONS FOR IMPROVEMENT**

Based on the twenty-day research residency executed at the Mishrashala repository, several structural, methodological, and institutional pathways have been identified to expand the documentation, preservation, and dissemination of the Panthei cultural tradition. The following recommendations are proposed to enhance future academic workflows and community engagement from the perspective of a student researcher.

1. Standardization of Clay Composition Analysis

While basic porosity and thermal logging experiments were successfully completed using generic local river silt replicas, future material testing should incorporate advanced spectrometry and mineralogical profiling. The exact mechanical behavior of the unbaked mold is heavily dependent on clay-to-additive ratios. Future internships should be equipped with X-ray diffraction (XRD) tools to precisely quantify the micro-structural breakdown of the alluvial soil, sand, rice husk, and cow dung matrix. Standardizing this raw material blueprint will allow the museum to compile an exact structural recipe, ensuring that the

physical properties of the Kacha Matti can be perfectly replicated in conservation labs before the native potting soil sources disappear due to modern urbanization.

2. Longitudinal Psychological and Somatic Studies

The cognitive and psychological frameworks formulated during this internship-specifically regarding mandala-based centering and threshold anxiety mitigation-rely heavily on historical data and theoretical modeling. To validate these connections empirically, future research initiatives should incorporate active psychological testing. Longitudinal studies could be designed to track modern practitioners across the five weeks of Chaitra, utilizing biometric indicators (such as heart-rate variability and salivary cortisol tracking) alongside standardized state-trait anxiety inventories (STAI). This would transition the psychological analysis from a conceptual framework to a measurable, data-driven study on how traditional haptic rituals actively lower modern physiological stress.

3. Expansion of the Digital Archive into an Interactive Map

The photogrammetric rendering completed during the residency should be treated as a baseline for a broader digital humanities initiative. The current 3D digital model registry should be integrated with an interactive, open-access Geographic Information System (GIS) story-map. Future student interns should expand fieldwork parameters to map design variations across all thirty districts of Odisha. By pinning 3D models, artisan audio interviews, and regional Jhoti designs to their exact geographic coordinates, a comprehensive digital archive would be established. This platform would allow global scholars to study the stylistic shifts of the Panthei across coastal, interior, and tribal border zones in real time.

4. Direct Community Revival Workshops

To counteract the critical loss of oral blueprints observed among the younger generations in the Kumbhara Sahi settlements. Mishrashala should establish direct community-outreach loops. The museum should fund and host seasonal "**Artisan-to-Community**" transmission workshops. Veteran potters should be brought into the museum spaces as master facilitators to teach the traditional finger-measurement techniques (Angula) to both younger artisans and urban families. By converting the passive museum display into an active space for communal learning, the oral blueprints of the Panthei can be dynamically preserved, ensuring the living heritage survives well beyond the physical limits of static museum glass showcases.

● OVERALL LEARNING AND BENEFITS

The twenty-day research residency at the Mishrashala repository, which focused on the multi-disciplinary analysis of the traditional Odia Panthei mold, has provided an invaluable foundational experience. It has fundamentally reshaped my academic perspective on material culture, ethno-engineering, and vernacular psychology. By evaluating a single, fragile unbaked clay artifact through a combination of hard sciences and humanities, a profound understanding was gained regarding how traditional societies beautifully embed functional, complex systems into everyday domestic tools.

A primary technical benefit was realized in the field of digital preservation and museology. Mastering advanced photogrammetry to convert the physically fragile, light-absorbing clay mold into a highly accurate 3D digital twin provided me with practical, industry-standard conservation skills. Additionally, designing the physical exhibition layout within Mishrashala's seasonal gallery taught me the crucial skill of public-facing curation. I learned how to translate dense engineering blueprints, GIS regional maps, and historical text translations into accessible, engaging visual displays for the general public.

From a scientific and material culture standpoint, the laboratory testing conducted on replica clay compositions yielded eye-opening insights. Quantifying the high porosity metrics of unbaked river silt and observing a 5°C cooling curve drop through evaporative cooling experiments completely bridged the gap between raw physics and ancient traditions. It was a vital learning outcome to realize that the design choices of the Panthei-leaving the clay unfired and porous-were not due to a lack of technological advancement, but were intentional choices made to optimize thermodynamic and biochemical performance during the intense summer heatwaves of Chaitra.

Most significantly, the internship provided transformative academic growth in the study of behavioral and cognitive psychology. Analyzing the spatial placement of the mold at the household threshold through the lens of liminal behaviorism illuminated the deep psychological mechanics of folk traditions. I learned how structured rituals serve as essential, adaptive cognitive coping mechanisms. By establishing a sacred boundary at the doorstep-the boundary separating domestic security from unpredictable outside hazards-practitioners were provided with a vital sense of situational control that effectively eased deep-seated survival and health anxieties.

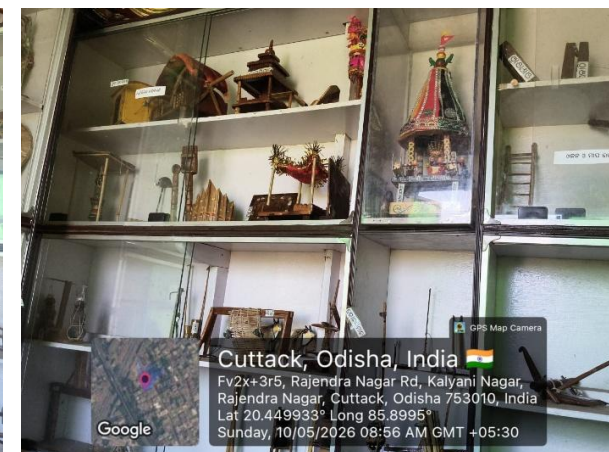
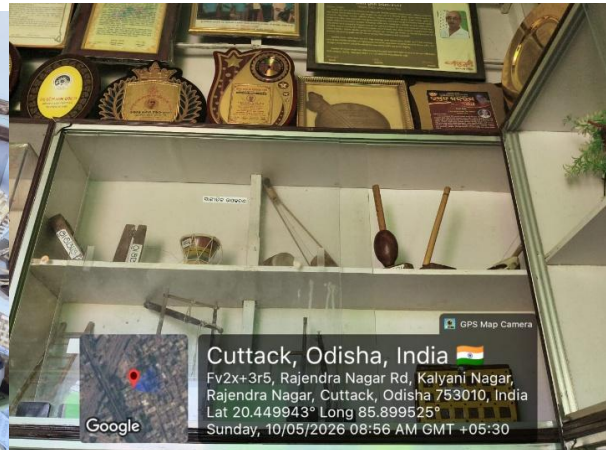
Furthermore, exploring the symmetrical "square-within-square" layout of the Panthei using Jungian mandala frameworks highlighted how geometric design can actively reduce cognitive clutter and induce mindfulness.

Ultimately, this internship has instilled in me a deep professional respect for vernacular heritage. I have come to realize that these fading domestic artifacts are not merely stagnant relics meant for passive observation; they are highly sophisticated, time-tested systems carefully engineered by traditional cultures to regulate human health, protect the family unit, and support communal psychology across generations. This invaluable perspective will undoubtedly guide my future research paths in anthropology and material sciences.

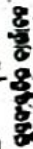
ANNEXURES

● GEO TAG PHOTOGRAPHS









କ୍ଷେତ୍ର ପ୍ରଶିକ୍ଷଣ କାର୍ଯ୍ୟକ୍ରମ

ବ୍ରହ୍ମାଣ୍ଡ ଓ ତତ୍ତ୍ୱ

ମିଶ୍ରାଙ୍କ ଦ୍ଵାରା ଆୟୋଜିତ କ୍ଷେତ୍ର ପ୍ରଶିକ୍ଷଣ କାର୍ଯ୍ୟକ୍ରମରେ ଡେ.କେ.ବି.କେ ମହାବିଦ୍ୟାଳୟର ପ୍ରାଚୀନ ଛାତ୍ରା-

Sanjibani Jena, BA24-027

ନିର୍ଦ୍ଧାରିତ ଦିନଗୁଡ଼ିକରେ ଗପସ୍ଥିତ ରହି, ସଫଳତାରେ ସମ୍ପୃକ୍ତ ଅଂଶଗ୍ରହଣ କରି

ଏହି ପ୍ରମାଣ ପତ୍ର ଗ୍ରହଣ କରୁଛନ୍ତି ।

ଦିଶୁଥାଏ ତାଙ୍କ ରବିଷ୍ୟତର ଉଦ୍‌ଘୋଷଣା ଉନ୍ନତି କାମନା କରୁଛି ।

ॐ नमो भगवते वासुदेवाय

ପୁଷିକାତା ସମାବେଶ, ନିଗ୍ରହାନ

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● SURVEY FORMS / QUESTIONNAIRES

FIELD RESEARCH SURVEY & QUESTIONNAIRE : STUDY OF THE PANTHEI (SAMPLE)

Research Project : Documentation of Chaitra Mangalabara Osha Material Culture

Target Audience : Practitioners (Devotees) and Traditional Artisans (Potters)

Date of Survey :

Location/District :

Respondent Name (Optional) :

Age / Gender :

Part A: Socio-Demographic & Practice Baseline

1. For how many generations has the Chaitra Mangalabara Osha and the use of the Panthei been practiced in your family ?

- ☐ Current generation only
- ☐ 2 Generations (Since mother/mother-in-law)
- ☐ 3 or more generations (Ancestral tradition)
- ☐ Unsure

2. Where do you primarily source your Panthei structure for the Chaitra Tuesdays?

- ☐ Handcrafted at home by family members
- ☐ Purchased from local village potters (Kumbhara Sahi)
- ☐ Purchased from urban makeshift seasonal markets
- ☐ Replaced entirely by brass/silver metal alternatives

3. On which Tuesdays of the Hindu month of Chaitra do you actively establish the Panthei?

- ☐ All Tuesdays of the month
- ☐ Only the first and last Tuesdays
- ☐ Only the final Tuesday (Sesa Mangalabara)
- ☐ Other :

Part B: Structural, Material & Design Attributes

4. What is the primary material composition of the Panthei utilized in your household?
- ☐ Raw, unbaked river silt / black clay (Kacha Matti)
 - ☐ Fired/baked terracotta clay
 - ☐ Painted ceramic/plaster of Paris
 - ☐ Direct floor drawing using rice paste (Jhoti/Chita) without a physical mold
5. Which architectural pattern best describes the geometric layout of your family's Panthei?
- ☐ Single square with a central circular pit
 - ☐ Concentric, nested double squares with a central circular pit
 - ☐ Circular rings with a central pit
 - ☐ Other complex geometric layout:
6. Does your Panthei structure feature a "Sopana" (a lateral, handle-like path/protrusion)?
- ☐ Yes, it is a permanent feature of our clay mold.
 - ☐ No, our mold is perfectly symmetrical without any extensions.
 - ☐ The protrusion is manually added with wet mud before the ritual begins.
7. If a clay Panthei is used, are any organic additives mixed into the soil to your knowledge?
(Select all that apply)
- ☐ Fine paddy husk (Kunda)
 - ☐ Processed cow dung
 - ☐ Chopped straw fibers
 - ☐ None (Pure riverbank silt only)
 - ☐ Unsure
8. What is the traditional method used to decorate the structure before the offering is placed?
- ☐ Coated with vermillion (Sindura) and sandalwood paste
 - ☐ Intricately painted with liquid rice paste (Chita/Jhoti)
 - ☐ Decorated with wild seasonal flowers only
 - ☐ Left completely plain to respect the raw earth

Part C: Spatial, Ritual & Functional Execution

9. Where is the Panthei physically positioned during the core hours of the Osha?
- ☐ Inside the main household temple room (Thakura Ghara)
 - ☐ Exactly at the center of the main entrance doorstep threshold
 - ☐ Outside the house, directly on the roadside pathway (Bata)
 - ☐ In the central open courtyard (Tulasi Chaura area)
10. When placing the Panthei, in which direction is the structural handle/gateway (Sopana) pointed?
- ☐ Pointing inward toward the interior of the house
 - ☐ Pointing outward toward the main road/pathway
 - ☐ Facing East, irrespective of the house orientation
 - ☐ Direction does not matter in our family custom
11. What specific ritual offering (Bhoga) is uniquely contained within the central circular basin?
- ☐ Traditional curd-based Chaiti Pana
 - ☐ Sprouted moong and flattened rice (Chuda Ghasa)
 - ☐ Raw milk, water, and tulsi leaves
 - ☐ Mixed seasonal fruits and sweets
12. What is the final ritual treatment of the unbaked clay Panthei once the Chaitra month concludes?
- ☐ Immersed completely in a local water body (pond/river)
 - ☐ Left at the base of a sacred tree (e.g., Peepal or Neem) to dissolve naturally
 - ☐ Crushed and mixed back into the domestic garden soil
 - ☐ Preserved carefully in a dry storage area to be reused next year

Part D: Scientific, Cognitive & Psychological Connections

13. In your personal view, why is unbaked, porous clay (Kacha Matti) traditionally mandatory for this ritual instead of a metal plate?
- ☐ It keeps the liquid offering (Pana) naturally cool in the summer heat.
 - ☐ Earth symbolizes the absolute purity and womb of Goddess Mangala.

- ☐ It is an ancestral custom that cannot be questioned or altered.
- ☐ It is economically cheaper and easily disposable.

14. During the extreme heatwaves of Chaitra, how does the physical presence of the Panthei at your doorstep affect your mental state regarding family well-being?

- ☐ It provides a deep sense of psychological security and peace.
- ☐ It minimizes anxiety regarding summer sicknesses and heat strokes.
- ☐ It does not alter my mental state; it is strictly a religious duty.

15. Psychologically, how do you view the doorstep boundary where the Panthei is placed?

- ☐ As a high-risk transition point where outside negativity/illness must be stopped.
- ☐ Simply as an aesthetic entrance to welcome guests and the divine.
- ☐ As a neutral physical space with no spiritual or mental boundaries.

16. Does the process of manually preparing, drawing, and centering the geometric Panthei act as a stress-relieving or meditative activity for you?

- ☐ Yes, it demands deep focus and completely calms my mind.
- ☐ Yes, but only because of the festive family bonding involved.
- ☐ No, it feels like an exhausting, time-pressured household chore.

17. When you observe matching Panthei structures placed at every single doorstep down your street, what is your primary psychological response?

- ☐ A profound sense of community unity, shared reality, and social support.
- ☐ A feeling of competitive religious pride among neighbors.
- ☐ It feels normal and does not evoke any specific emotional response.

Part E: Heritage Continuity & Future Preservation

18. Are the younger members (children/grandchildren) of your household actively involved in learning the creation or geometry of the Panthei?

- ☐ Yes, they actively assist in drawing the geometry and setting it up.
- ☐ They watch passively but do not know how to execute it independently.
- ☐ No, they show a clear lack of interest due to modern lifestyle shifts.

19. What do you observe as the greatest threat to the survival of the traditional clay Panthei tradition? (Select the primary reason)

- ☐ Non-availability of authentic river silt clay due to environmental bans.
- ☐ Commercialization and the replacement of clay with plastic/metal plates.
- ☐ Loss of oral construction knowledge among local potter families.
- ☐ Lack of time among modern working women to perform elaborate threshold rituals.

20. What step should cultural institutions (like Mishrashala) take to preserve this unique Odia ethno-engineering tradition?

- ☐ Create free, accessible digital 3D archives and video tutorials of the geometry.
- ☐ Host hands-on clay modeling workshops led by traditional potters.
- ☐ Set up specialized seasonal exhibitions to educate urban youths.
- ☐ Offer financial subsidies to traditional potters to keep making clay molds.

Thank you for your valuable participation. Your insights will greatly assist in preserving the living folk heritage of Odisha.

● ACTIVITY LOG/DAILY DIARY

J.K.B.K Govt. Degree College

Internship

Log Book

Academic Year: 2025-26

Faculty: Psychology

Name of Student: Sanjibani Jena

College Roll. No: BA24-027

Topic: Mindfulness in mind: Psychology of the Pandemic

University Regd. No: 2401011720070208

Area/Place: Mishra Shala, Rajendra Nagar, Cuttack, Odisha 753010

Sl. No	Date	Nature of activity	Time From-to	Sign of the student	Sign of the Mentor (weekly)	Sign of concerned authority
1.	09.05.26	Orientation	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
2.	10.05.26	Environment analysis	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
3.	11.05.26	Historical study	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
4.	12.05.26	Traffic Mapping	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
5.	13.05.26	Exhibit Analysis	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
6.	14.05.26	Cultural context- Utilization	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
7.	15.05.26	Behavioral Tracking	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
8.	16.05.26	Guest Engagement Study	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
9.	17.05.26	Youth Engagement Study	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
10.	18.05.26	Group Dynamics	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
11.	19.05.26	Cultural Psychology	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
12.	20.05.26	Field Observation	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
13.	21.05.26	Data Collection	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
14.	22.05.26	Sentiment Analysis	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am
15.	23.05.26	Archival Assistance	9:00 am to 1:00 pm	Sanjibani Jena	Dash	Am

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<http://ignca.gov.in/cultural-mapping-odisha>

(Provides ethnographic footage and field notes regarding seasonal clay tool production across coastal potting clusters).

Mishrashala YouTube Channel / OTV News Archive. (2023). Mishrashala Museum Showcase:

Preserving the Dying Lifestyles and Antiques of Rural Odisha. Available at:

<https://www.youtube.com/watch?v=ZKVZap7erLQ>

(Broadcast clip detailing the exact host museum ecosystem, layout methodology, and rural sourcing methods used during the internship).