

# KNOWLEDGE REPRESENTATION AND MODELLING OF ELEMENTS OF VERNACULAR ARCHITECTURE

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# PURPOSE OF RESEARCH

1

Study of vernacular architecture  
as cultural heritage

2

Representation of vernacular  
architectural knowledge in digital  
environments

3

Development of a conceptual  
model based on CIDOC CRM

# VERNACULAR ARCHITECTURE

Structures constructed without formal scientific principles or professional architectural guidance

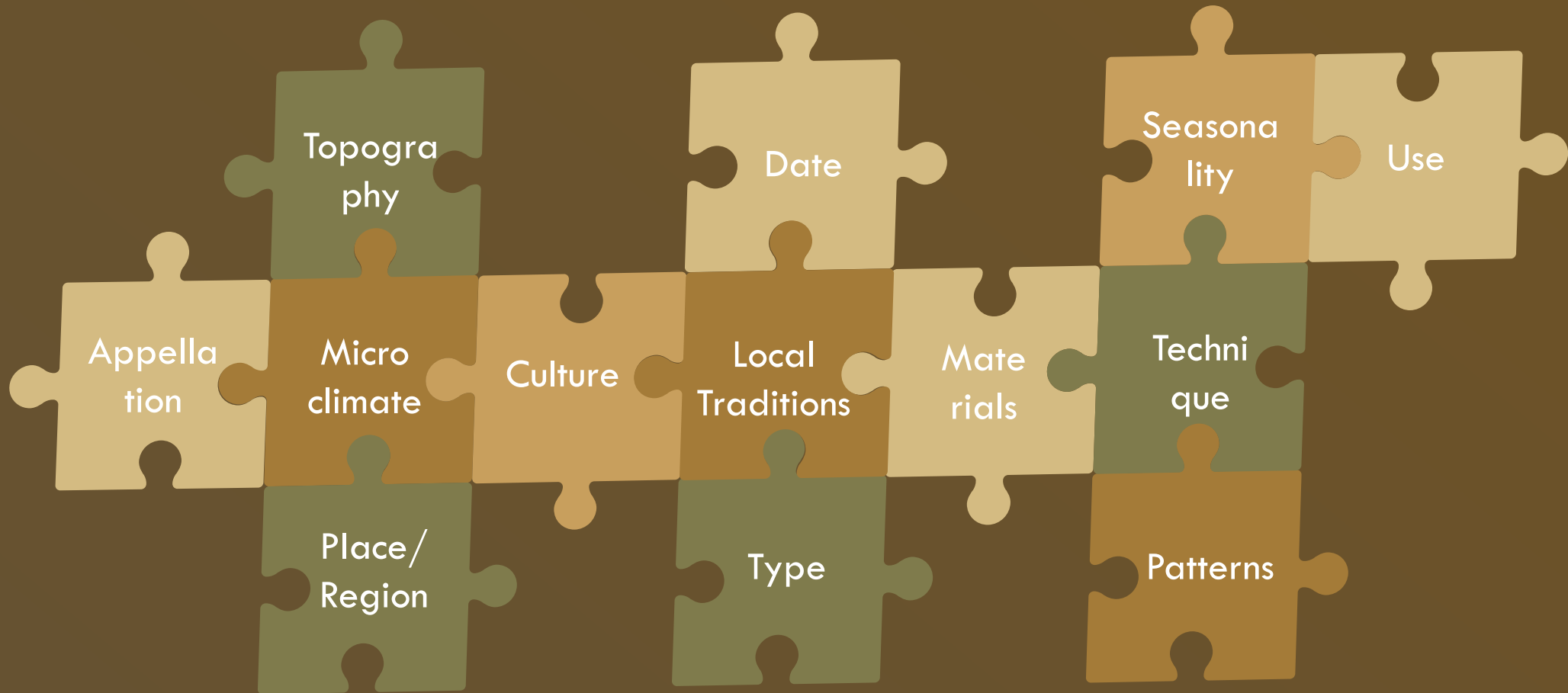
Traditional, locally available materials and construction techniques

Collective knowledge and experience of local communities, passed down through generations

Local environmental and climatic conditions

Not a specific architectural style, but a design approach that evolves over time

# VERNACULAR ARCHITECTURE ATTRIBUTES



# CIDOC CRM

An international standard ontology for cultural heritage documentation

Provides a formal semantic framework for describing cultural heritage information

Follows an event-based modeling approach

Developed to support interoperability between heterogenous datasets

Enables  Integration  
Exchange  
Long-term preservation of cultural information

## SCOPE

Covers scholarly and scientific documentation of cultural heritage

Focuses on cultural entities and their relationships

Enables meaningful data exchange and transformation

Ensures compatibility with existing documentation standards

# WHY CIDOC CRM?

It is event-centered model

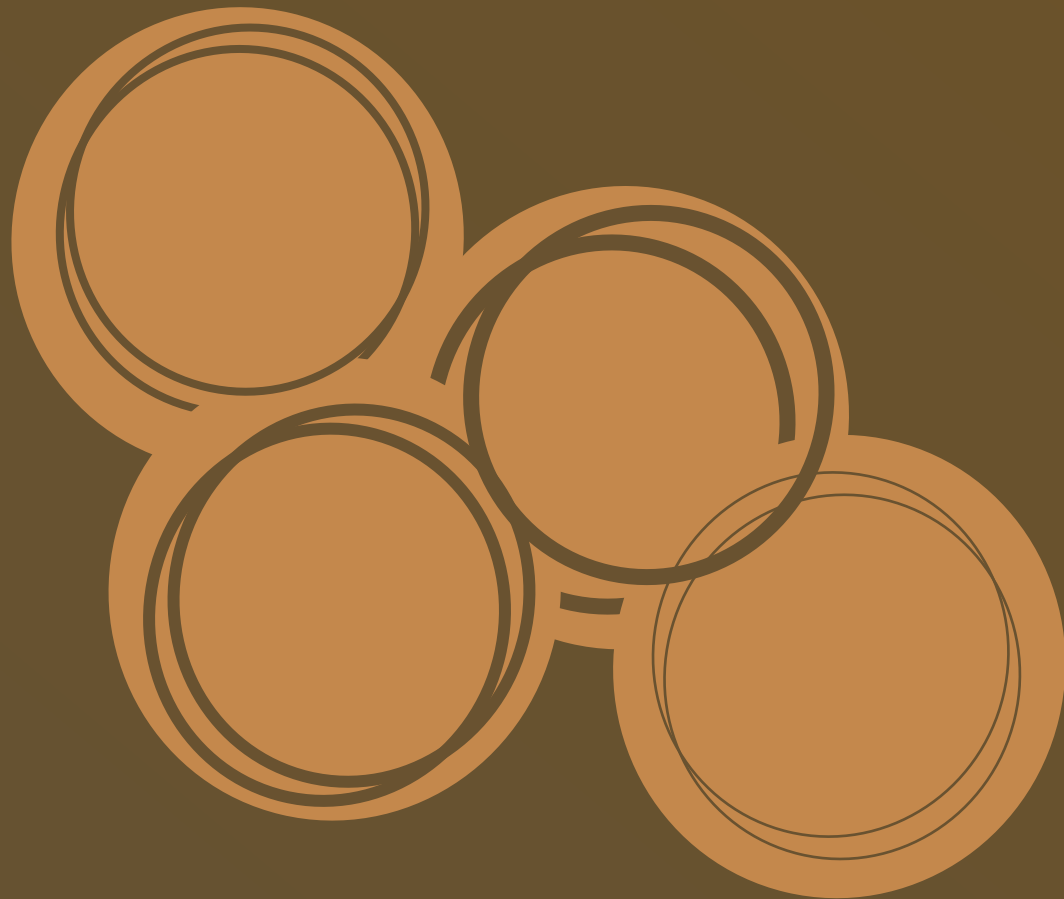
Supports both tangible & intangible cultural heritage

Emphasize in relationships, not isolated data

Ensures Semantic Interoperability

It is extensible & flexible

# RELATED WORK



## Documenting Architectural Styles Using CIDOC CRM

Documentation & management of cultural  
heritage information

Representation of: Architectural styles



Historical periods



Architectural elements



# VERNACULAR ARCHITECTURE VS ARCHITECTURAL STYLES

## Architectural Styles

## Vernacular Architecture



Aesthetic rules & formal design principles

Not standardized design rules

Different regions

Specific location shaped by environmental & cultural conditions



Imported materials & industrial techniques

Local materials & traditional construction techniques



Clearly defined historical periods & stylistic phases

Develops through time



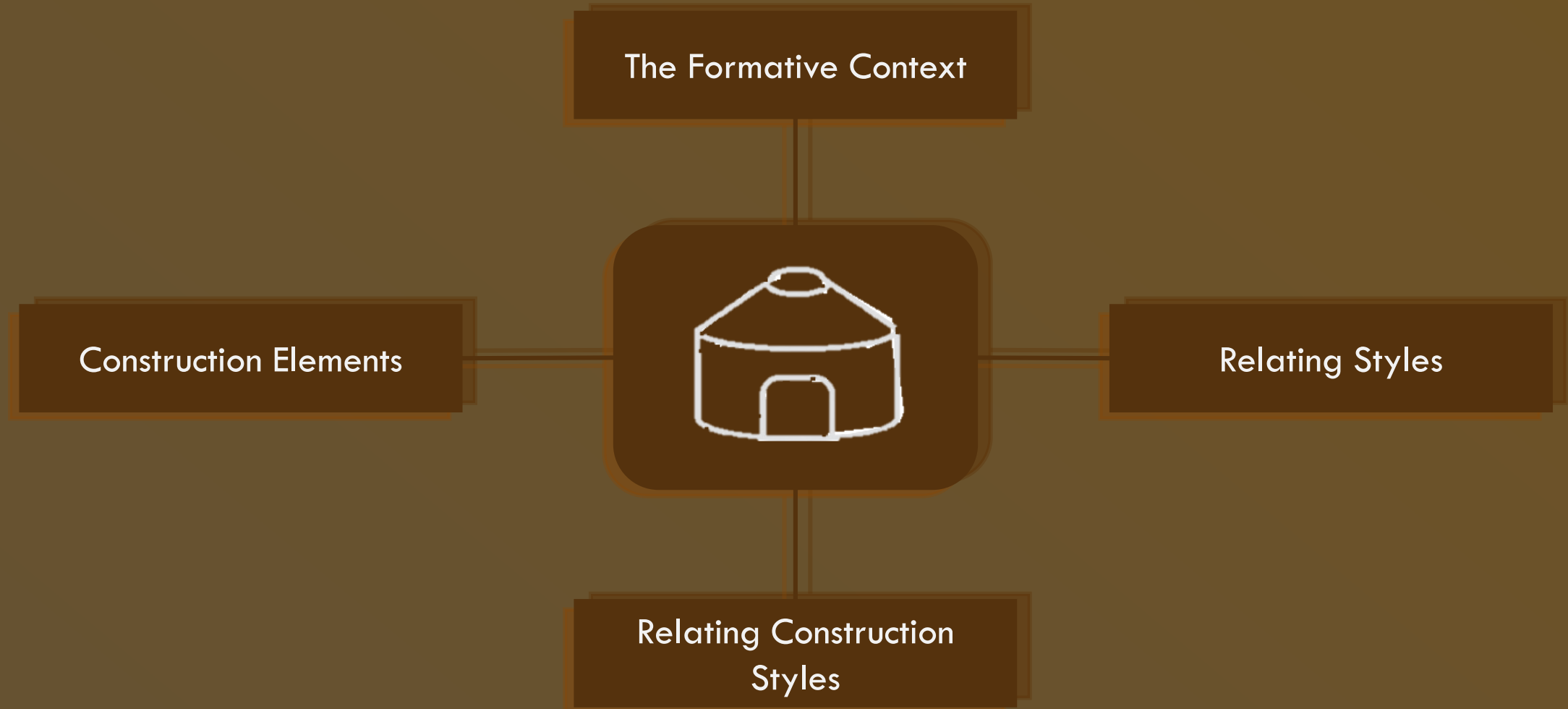
Ideological, political or artistic movements

Everyday life, local identity & community-based knowledge

Easily categorized within typologies & hierarchical stylistic systems

Difficult to strictly classify

# CASE STUDY: MONGOLIAN YURT



# CASE STUDY: MONGOLIAN YURT



# THE FORMATIVE CONTEXT



Environmental conditions

Microclimate

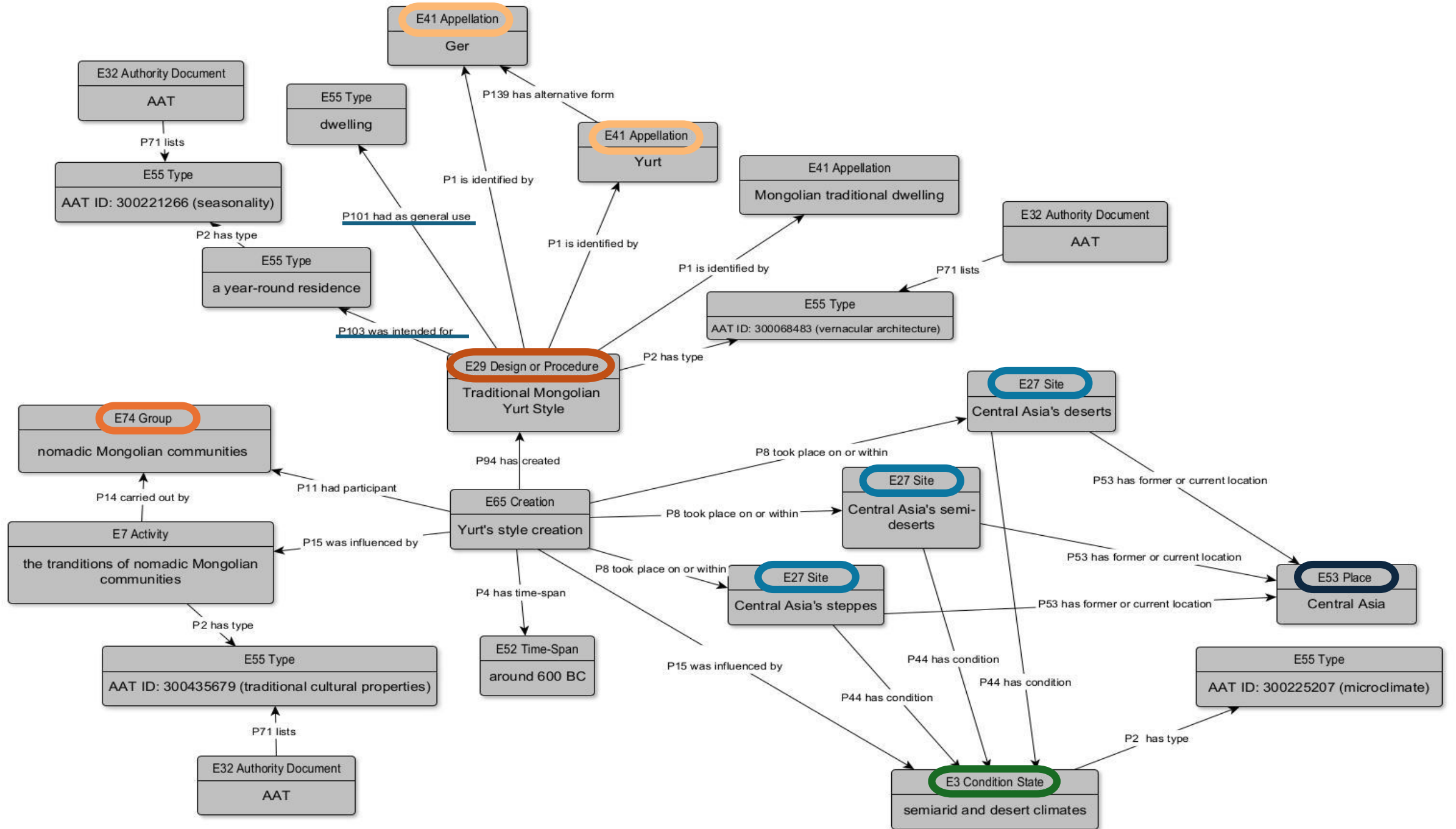
Cultural practices

Topography

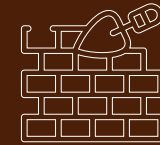
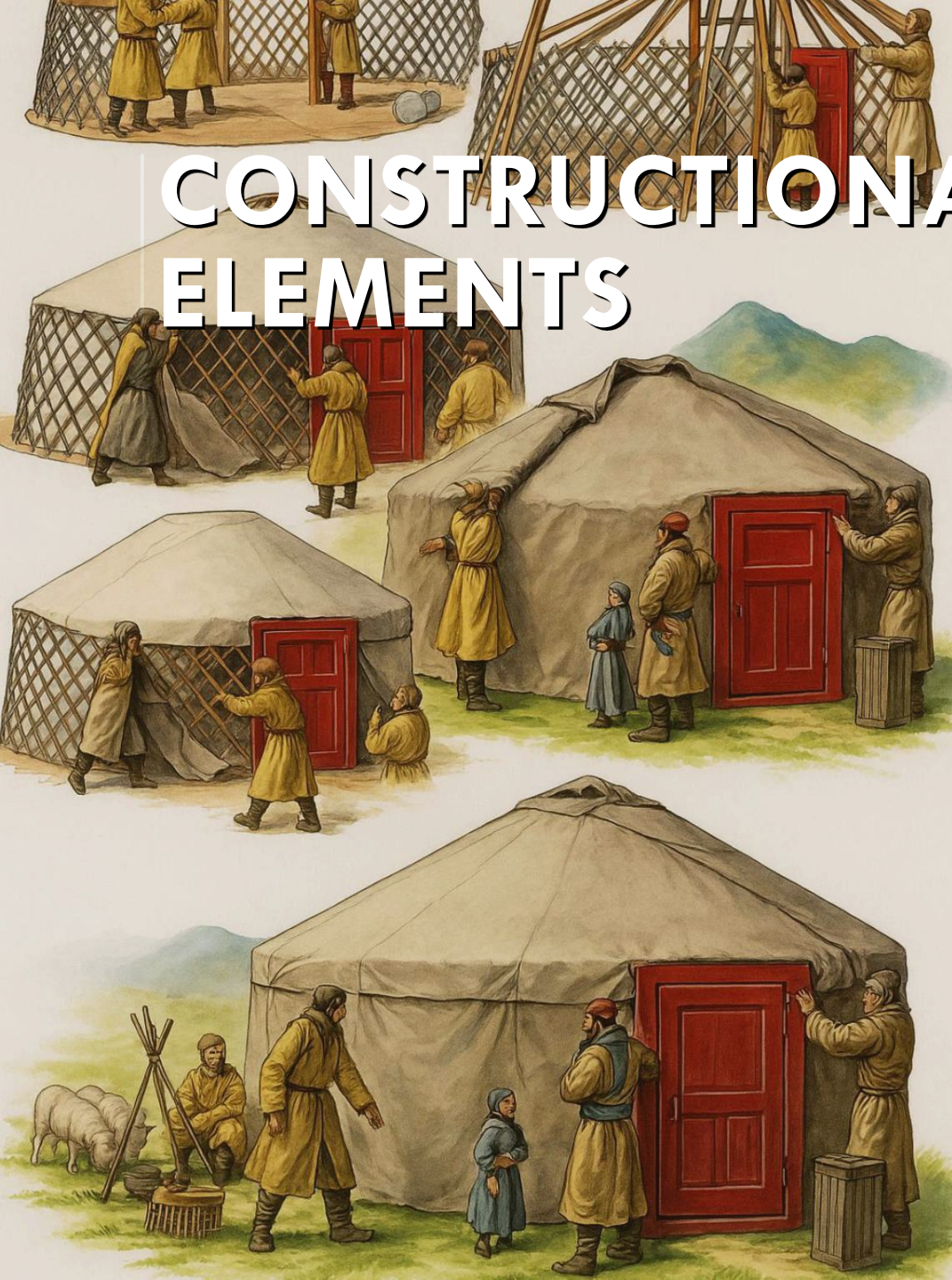
Available materials

Socio-economic structures





# CONSTRUCTIONAL & MORPHOLOGICAL ELEMENTS



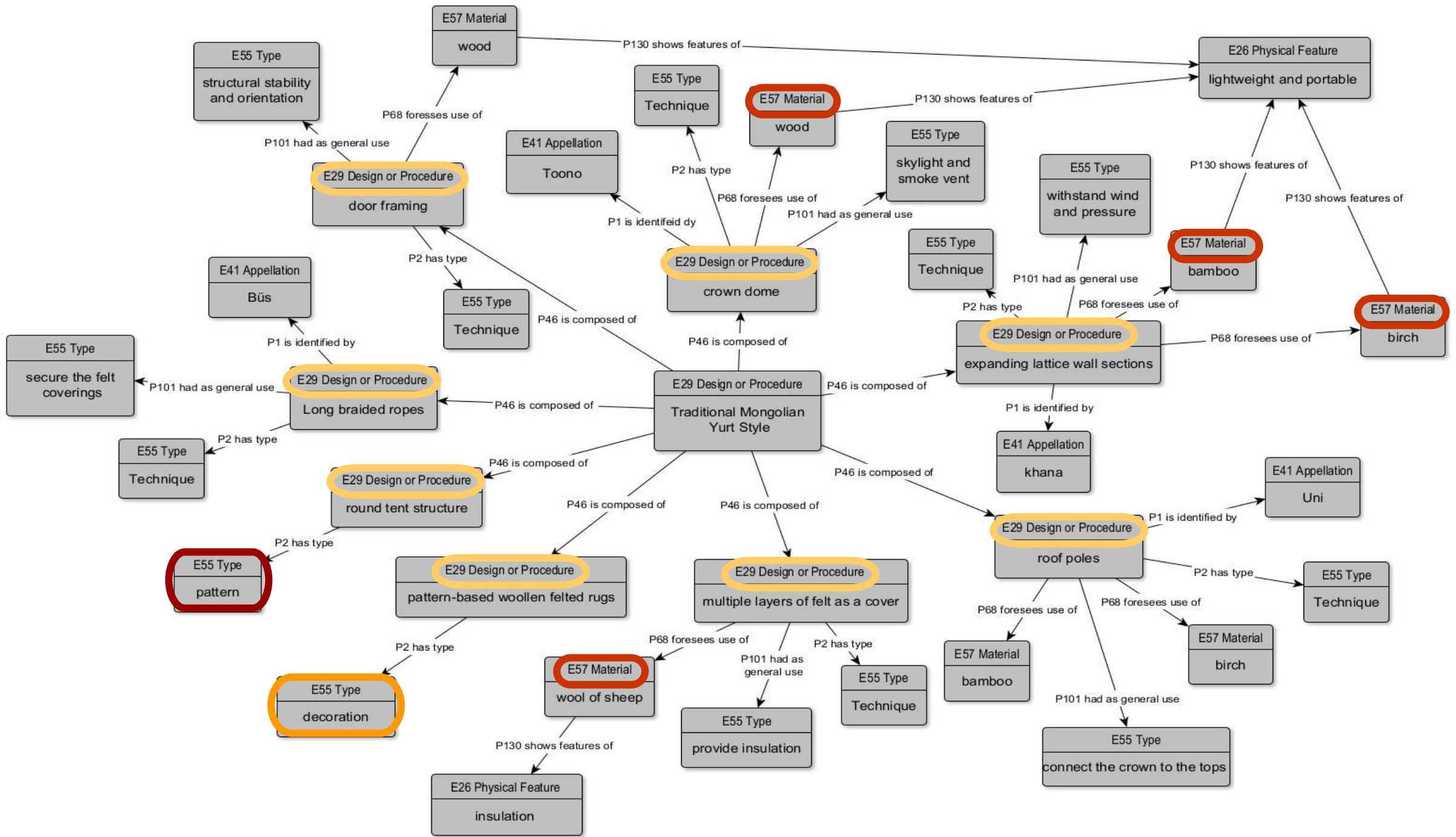
Local materials & traditional techniques

Functional features & climate-responsive forms

Building types

- Domestic use
- Agricultural use
- Communal use

Decorative elements reflecting local identity



# RELATING VERNACULAR STYLES

Shared principles

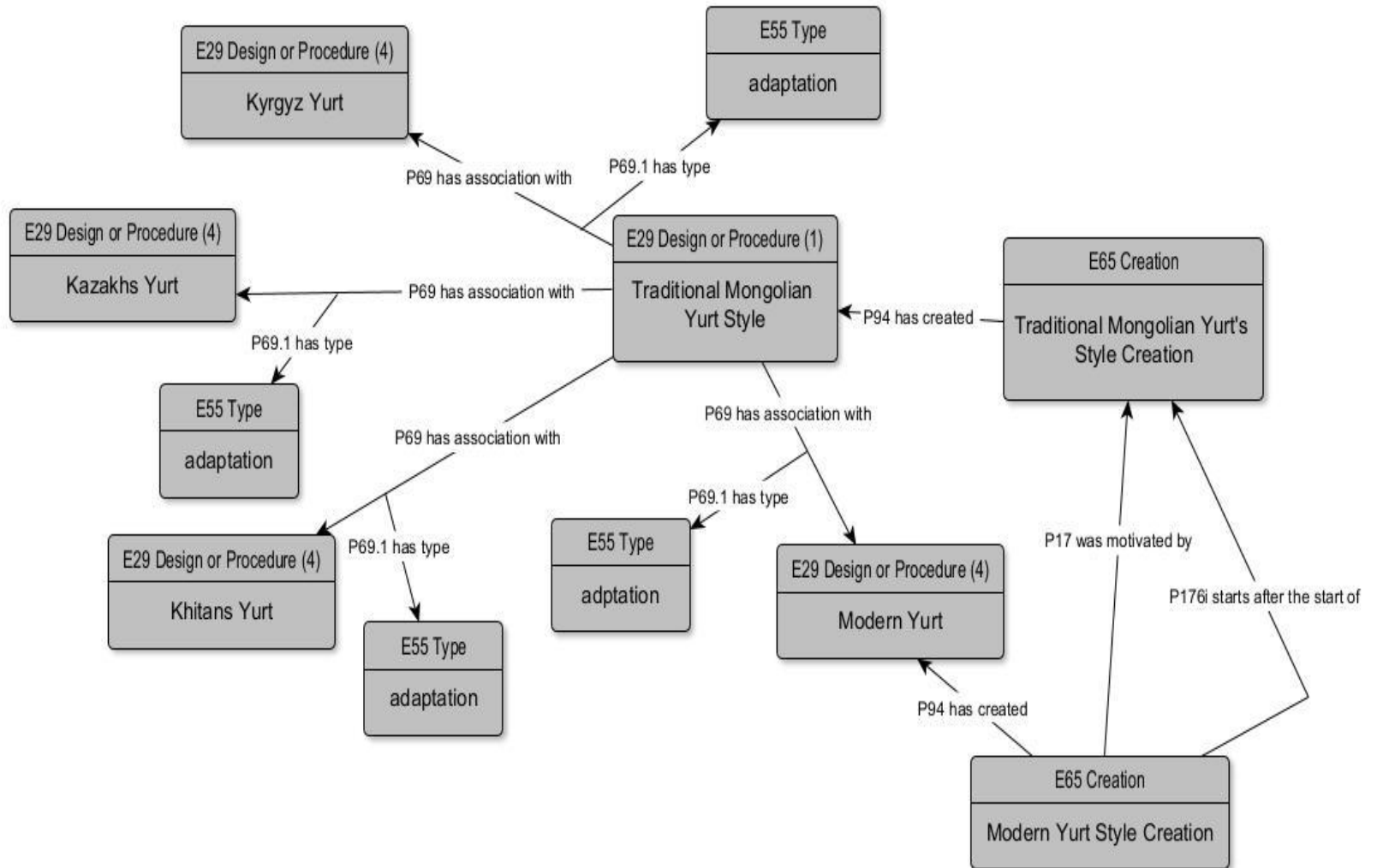
Environmental challenges

Cultural practices

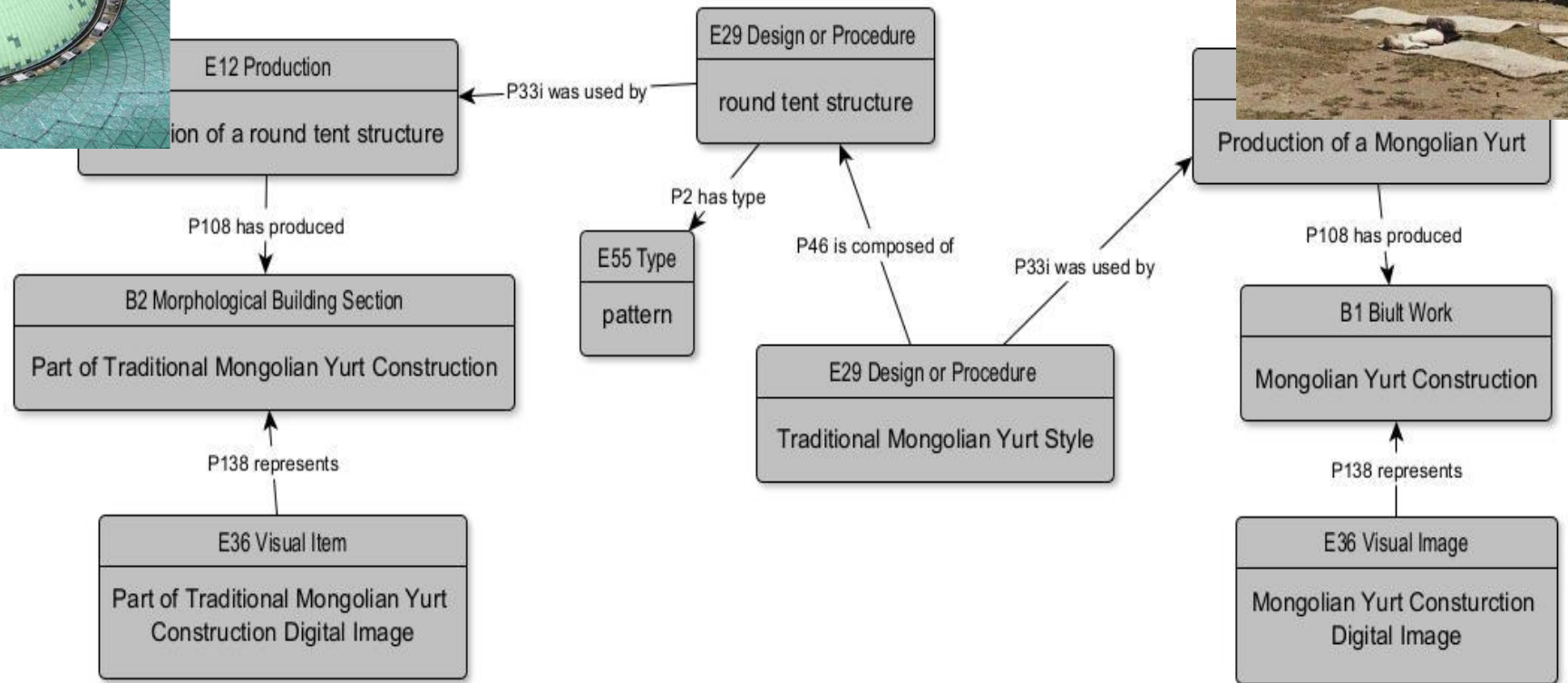
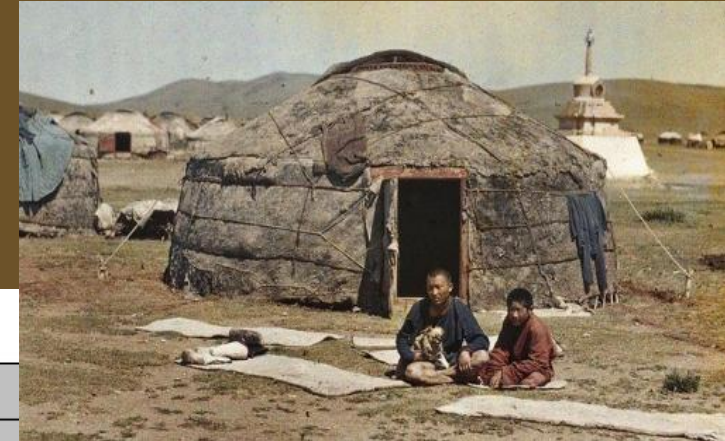
Material constraints

Patterns in techniques,  
organization & usage

*Vernacular architecture continues to influence contemporary construction*



# RELATING VERNACULAR CONSTRUCTION STYLES



# CASE STUDY: IGLOO



# FROM THEORY TO ICADL 2025

## Modeling Styles of Vernacular Architecture using CIDOC CRM

by

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ICADL 2025, 3-5 December 2025

Presentation on ICADL (International Conference  
on Asia-Pacific Digital Libraries) 2025



Manila, Philippines



3-5 December

Conference is about:

Digital libraries & archives

Knowledge organization & representation

Cultural heritage & documentation

Information & data technologies

Access, preservation & management of digital content

# CONCLUSION

Vernacular architecture is a living cultural process, not a fixed architectural style

Style-based models are insufficient to capture its multifaceted & collective character

CIDOC CRM provides a robust semantic framework for modeling cultural complexity

Effective modeling requires careful conceptual decisions, not automatic mapping

The proposed data model bridges tangible structures & intangible cultural knowledge

**THANK YOU FOR YOUR TIME**

