TOWARDS MORE CULTURALLY COMPREHENSIVE DESIGN

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Outline

- Background
- Research Objective
- Elements of Culture
- Preliminary Study: Design Requirements
- Next Steps

Background: Design and DGD&HA

- Engineering Design → meeting design requirements
  - Requirements:
    - End user needs
    - End user context
  - Successful in local context, not as successful in frontier context

- Design for Global Development and Humanitarian Applications (DGD&HA)
  - Improve livelihood
  - Decrease negative health impacts
  - Increase global access to electricity
  - Economic development

Design for Global Development Efforts

Adoption and diffusion struggle because of 3 themes. [1-48]

Lack of Awareness
- o Models showing impacts on the community if they adopted alternative fuels
- o Integrated impact models on health, economics, and social well-being.
- o Models of changed energy profiles

Resource Availability
- o Models on how fuels and resources can be introduced and managed
- o Studies on proposed business models to increase fuel availability.
- o Models on how energy markets can be developed

Needs Not Met Post-Deployment
- o Uncovered religious needs, social needs, and cooking needs, health impacts, economic benefit
- o Use of methods to improve understanding of needs initially
- o More research goals:
  - • Increase knowledge sharing
  - • Increase emphasis on human dimension
  - • Comprehensive assessment of target population

Figure 4: Three themes for why design solutions not adopted in design for global development and the research efforts that resulted. [1-48]

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- A review of DGD&HA outcomes highlights designs are abandoned they don't have cultural fit
  - Religious
    - Cookstoves
  - Traditions & Customs
    - Cookstoves
    - Latrines
  - Economic Systems
    - Biomass pellets vs. wood fuel
  - Social Organization
    - Water projects

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Research Objective

- Design solutions provided are abandoned because they don't have cultural fit.
  - Wastes money
  - Diminishes end user's trust in designer/stakeholders

- **Objective:**

  Understand how designer's perceive the value of end user culture, define an understanding of end user culture, and acknowledge end user culture in design projects.

  Understand how introducing anthropological perspectives on culture influences designer's perception, definition, and acknowledgement of culture in DGD&HA projects.

- Design is ultimately about meeting design requirements
- 1st Background Study: measure the extent of cultural elements in design requirements.

Elements of Culture[49-58]

- ## Social Organization
  - Social structure and units within the society, family patterns, nuclear family, extended family, and social classes

- ## Religion
  - Answers basic questions about the meaning of life and supports values that society feels are important

- ## Economic Systems
  - Ways in which a society uses its limited resources to satisfy their wants and needs, what to produce, how to produce it, and for whom.

- ## Language and Symbols
  - Spoken language or symbols used within the society to relay messages

- ## Customs and Traditions
  - Rules of behavior are enforced ideas of right and wrong, customs, traditions, rules or written laws.

- ## Arts and Literature
  - Products and artifacts that help pass on the cultures' basic beliefs; art, music, literature, and folk tales

- ## Forms of Government
  - Systems and units developed to provide for the society's common needs, keep order, and protect from outside threats.

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Goal:

Describe the extent of end user cultural elements in design requirements established for design for global development and humanitarian applications projects in frontier context.

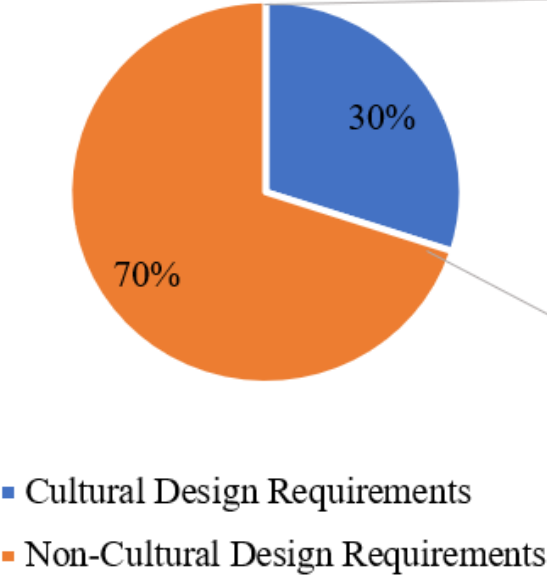## Preliminary Research Question 1:

What elements of the end user's culture do engineers focus on in the design requirements for design for global development and humanitarian applications projects in frontier context?

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Preliminary Study: Methodology

1. Collect DGD&HA project reports and guidelines.
   - *CRITERIA:*
     - Explicitly detail design requirements in documentation
     - Alternative technology, alternative energy devices, mobility aids, and medical devices.
     - Projects conducted by designers that are not members of the end user's society.

2. Record the document type designers, target end user and locale, product/design type, goal, method to acquire end user information, if end user engagement occurred, and the explicit design/user requirements.

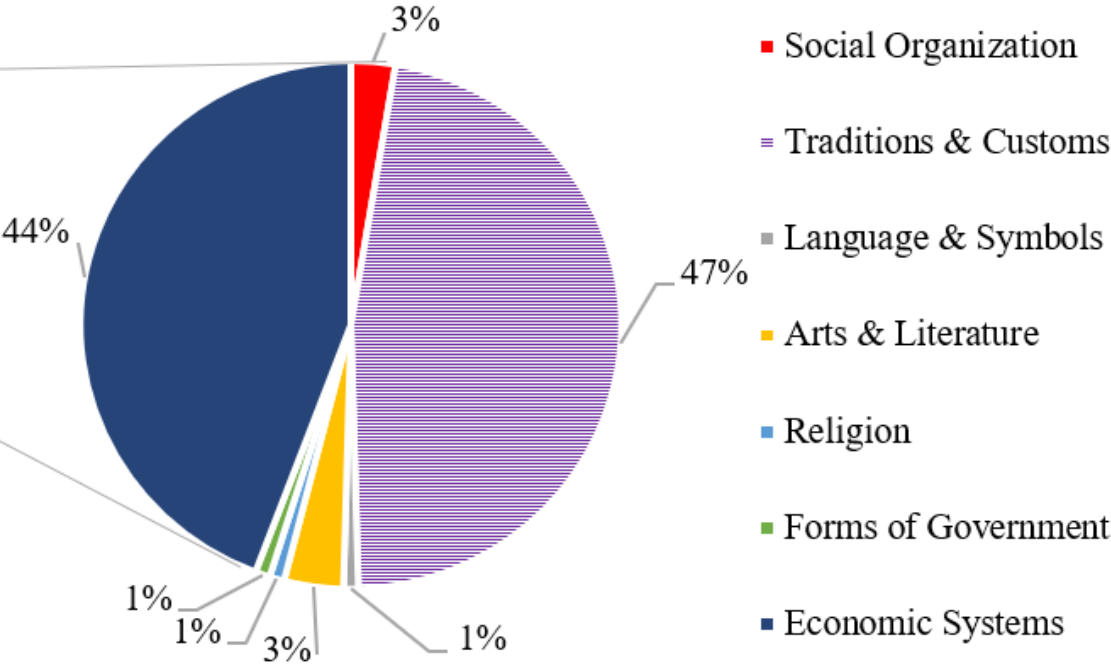3. Categorize the requirements that fall within the elements of culture.

Preliminary Study: Methodology

Author	Date	Type (Journal Article, Conference Proceeding, Project Report, Technical Paper)	Approach						Requirement Reflecting an Cultural Appraisal Category						
			Designer (Engineer Undergrad Student Team/Group, Graduate Research Team, Industry/NGO, IGO)	End User and Locale	Product/Design Type (Mobility Aid/Medical Device/Alternative Energy System/Alternative Tech)	Goal	Method (Interview, Survey, Field Study, Existing product, Persona Design, Etc.)	End User Engagement (With whom?)	User/Design Requirements	Social Org.	Customs & Traditions	Language & Symbols	Arts & Literature (Artifacts)	Religion (Beliefs, values)	Forms of Govt.	Economic Systems
Bowser, T.	2016	Journal Article	Student Team (Engineers at Oklahoma State)	Remote communities in Developing Countries	Alternative Technology (Bio sand Filter)	Develop low-cost bio sand water filter	Evaluation of existing products; Development of Prototype	None	Rugged; inflatable with hand pump; inflation valve located on the distal end; means of anchoring the inflatable in the form; low cost; availability							Low cost, availability (Local Materials
Burleson, G.	2017	Journal Article	Student Team (Engineers at OSU)	Ugandans (Soroti)	Alternative Technology (Improve a soap-making process)	Expand income-generating opportunities for women served by TERREWODE	Interviews (Used Social Justice Criteria)		create quality soap; two women must be able to carry device; ergonomic for the user and women carrying it; use resources readily available; waste must be easily disposable in Soroti, Uganda; Device must be consistent; durable; easily maintainable; theft protection; safe for users; inexpensive to manufacture; take minimal operator time to manufacture soap; simple and easy to manufacture; soap making process and device must be scalable for future improvements; process must create a sellable soap product allowing women to generate income	Sellable product so Women Generate Income	Ergonomic for user and women carrying it; safe for user					Low Cost; sellable product so Women Generate income; Local materials

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Preliminary Study: Results

- 38 reports on projects and guidelines
  - 12 – Journal articles
  - 11 – Conference Proceedings
  - 3 – Technical reports
  - 6 – Thesis
    - 1 PhD
    - 1 Masters
    - 4 B.S.
  - 6 – Project Reports

- 383 design requirements
  - 113 – design requirements that reflected culture
  - 270 – design requirements that did not reflect culture

Preliminary Study: Results

Measure of Culture in Design Requirements

- Cultural Design Requirements
- Non-Cultural Design Requirements

30%
70%

Measure of 7 Elements of Culture in Cultural Design Requirements

3%
44%
47%
1%
1%
3%
1%

- Social Organization
- Traditions & Customs
- Language & Symbols
- Arts & Literature
- Religion
- Forms of Government
- Economic Systems

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Conclusions and Next Steps

- Gaps within cultural elements considered in design requirement may correlate to gaps in outcomes, however, little data exists on why projects succeeded.

- *Preliminary Study 1*
  - Inter-rater reliability

- *Preliminary Study 2 – (Currently)*
  - Describe extent requirement generation methods and tools used in engineering design explicitly encourage designers to consider a cultural element of the end user.
  - ***Preliminary Research Question 2:*** *What elements of the end user's culture do engineers focus on in the methods and tools used to solicit end user information?*
  - Is there a correlation to the gaps in design requirements?

- *Preliminary Study 3 – (Currently)*
  - Describe anthropologist's perceive the value of culture, define an understanding of culture, and acknowledge culture in their work.
  - Interviews
    - Provide me with a perspective on culture to introduce to designers

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- ***Objective:***

  – Understand how designer's perceive the value of end user culture, define an understanding of end user culture, and acknowledge end user culture in design projects.

  – Understand how introducing anthropological perspectives on culture influences designer's perception, definition, and acknowledgement of culture in DGD&HA projects.

- RQ1: How do designers perceive the value of understanding culture of the end user in design projects?

- RQ2: How do designers acknowledge culture of the end user in their design process used for design projects?

- RQ3: How do designers define what it means to understand culture of the end user in design projects?

- RQ4: How does incorporating anthropological perspectives on culture influence the way designer's value, understand, and acknowledge culture of the end user in humanitarian design projects?

Thank You For Your Attention

Questions ?

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