Investigating the Perception of Ecological Sustainability Measures in Online Computing Services

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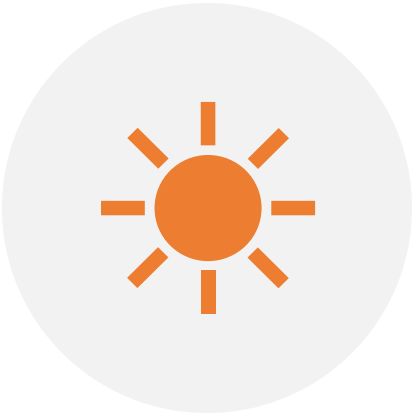
Motivation

- Sustainability in Computing
- Communicating Measures of Sustainability
- Transparency promotes informed decision and can influence change

Measures



using sustainable energy sources

optimizing server cooling systems to consume less power

optimizing worktime and workload distribution to consume less power

Dimensions of Communication

Graphical

Simple

Textual

Complex

Hypotheses

H1: The sustainability perception of the online computing service differs based on which display form is used.

H2: A graphical display leads to a higher sustainability perception of the online computing service than a textual display.

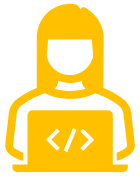
H3: A bigger scope of information leads to a higher sustainability perception of the online computing service.

The Online Survey

- Demographics

- Environmental Consciousness
  - pre-defined Environmentally Friendly Consumer Behavior Scale [1]

- Technology Affinity
  - pre-defined Affinity for Technology Interaction Scale [2]



Presentation Forms

Display Form


Seal


Table


Text

×

Information Scope


Simple


Complex

=

- **6 combinations** ordered by balanced Latin Square
- measured as sustainability perception [3]

Examples

Shop Design **A**

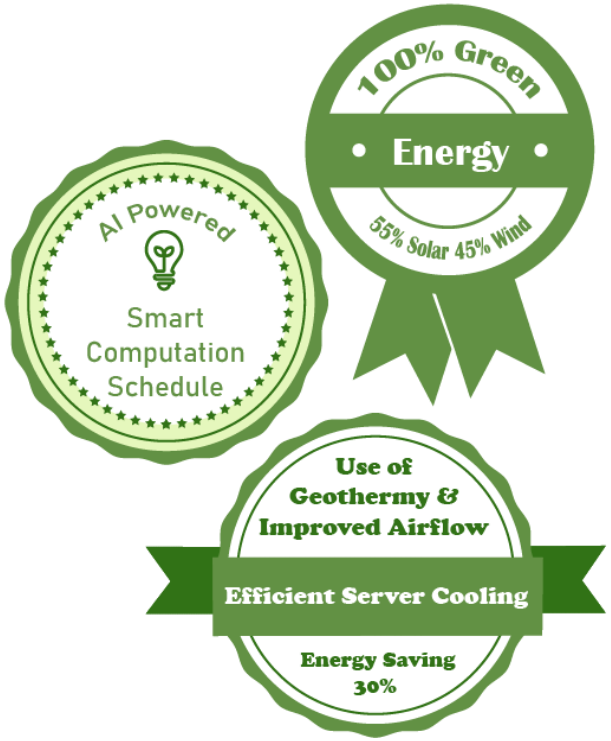
ShopBlue

Your Online Shopping Experience

Simple x Table

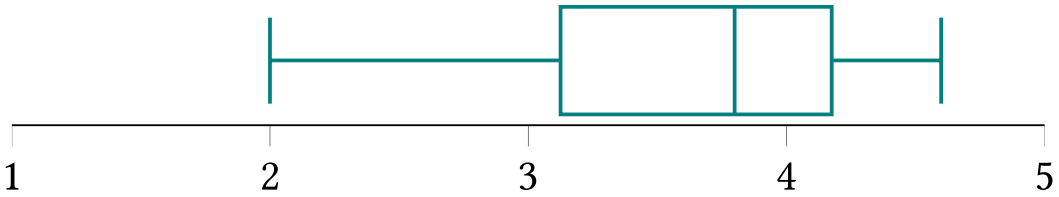
Energy Source	100% renewable sources
Server Cooling	30% energy savings compared to similar data centers
Computation workload distribution	Efficient and smart distribution of computational workload

Complex x Logo



Analysis: Participant Group

- 18 participants
- young, highly educated
- high environmental consciousness
- high technology affinity



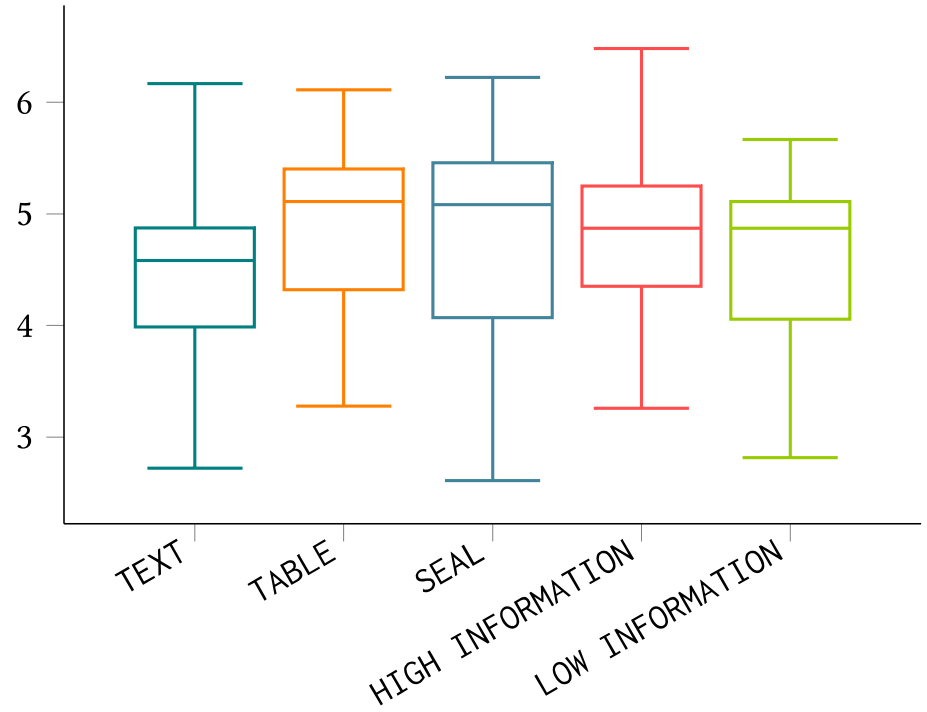
Box Plot Environmental Consciousness

Box Plot Technology Affinity

Analysis: Sustainability Perception

- **H1** tested with One-Way Repeated-Measures ANOVA
- **H2** & **H3** tested with Paired t-Test

→ not significant



Box Plot of the sustainability perceptions of the display forms and information scope variants

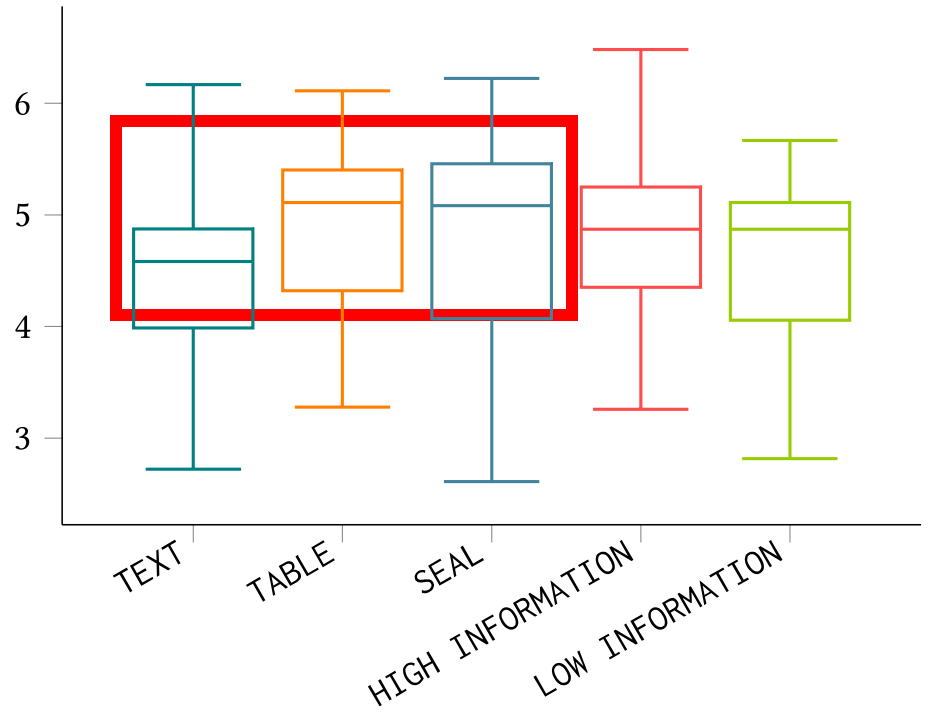
Discussion

No significanct differences found:
Accept null hypotheses

Display form and information scope do not influence the sustainability perception of an online computing service

Discussion

But:



Discussion

Limitations

Homogenous sample

Small sample size

Possibly lack of tangibleness of scenario

Discussion

Implication

- Might lower threshold for companies to display sustainability measures

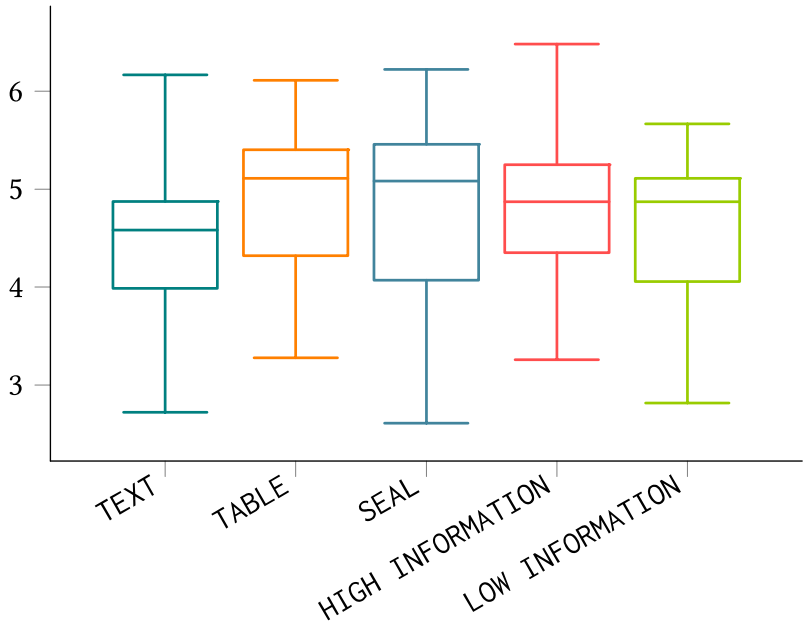
Future Work

- Repeat research:
  - With greater and more diverse sample
  - Examine influence of user factors
- Use other or more scenarios for online computing services
- Other display forms that were not considered

Conclusion

Energy Source	100% renewable sources
Server Cooling	30% energy savings compared to similar data centers
Computation workload distribution	Efficient and smart distribution of computational workload

- We explored if and how the presentation form of sustainability measures influences the sustainability perception of a computing service.
- No difference was found between the different forms.
- More research is needed to support or rebut our findings.
- Transparency promotes informed decision and can influence change, the question remains on how to improve transparency in communicating sustainability measures in computing services.



References

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