



Affordability Culture in Organizations

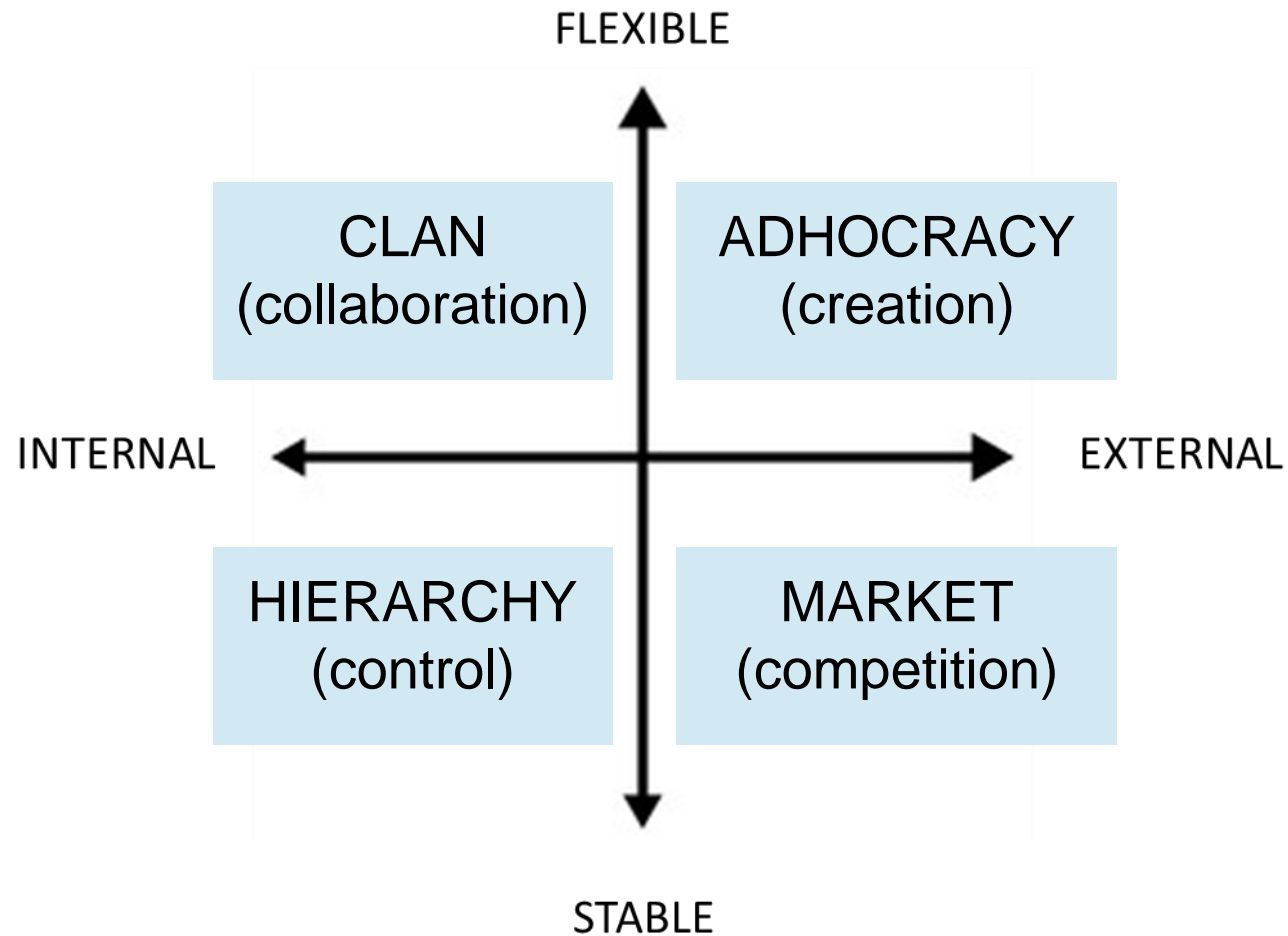
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Introduction

- Behavioral norms & values held by organization members lay basis for culture to form
 - Behaviors in turn drive performance of the organization (Balthazard et al., 2006)
- Competing values framework (Quinn & Rohrbaugh, 1983)
 - Flexible vs stable
 - Internal vs external
- Four main culture types (Cameron & Quinn, 2011)

Four Types of Organizational Culture



Adapted from Hartnell et al., 2011



Affordability

- Innovative and efficient approaches to reduce cost while maintaining high level of safety and mission success (Safie, Stutts, & Broussard, 2014)
 - Many definitions, general idea of “doing more with less”
- Systems perspective of affordability
 - Development, production, maintenance processes (Armengaud et al., 2017)

Reliability, Maintainability, and Affordability

- Optimized and adequate levels of R&M critical for achieving high level of safety, mission success, and low sustainment cost (Safie, Stutts, & Broussard, 2014)
- Systems designed more reliable & maintainable can lower total life cycle cost (Safie, Stutts & Broussard, 2014)
 - Most beneficial early in the design phase

Organizational Subcultures

- Within organizational cultures exist subcultures (Van Maanen & Barley, 1984)
 - Safety culture after Chernobyl (Cooper, 2000)
 - Affordability culture
- Only looking at systems approach of affordability too narrow
- In addition to engineering processes, looking at organizational components to cultivate an affordability culture



Safety Culture

- Parallels to be drawn from the implementation of safety culture
- Development of safety culture dependent on deliberate manipulation of various organizational characteristics perceived to impact safety
- Evaluating organizational behaviors related to affordability

Organizational Behaviors Informing Affordability Culture

- Non-monetary considerations associated with affordability
 - System's schedule of development & responsiveness to emerging needs (Schaffner et al., 2013)
 - Incentives and rewards (Jordan et al., 2012; Ngcobo & Naidoo, 2015; Shakeel & But, 2015)
 - Discretionary effort in organizations (Redmond & Sharafizad, 2020)
 - Implementation effort of new systems (Annarelli et al., 2018)
- These organizational behaviors often difficult to measure in dollar amounts

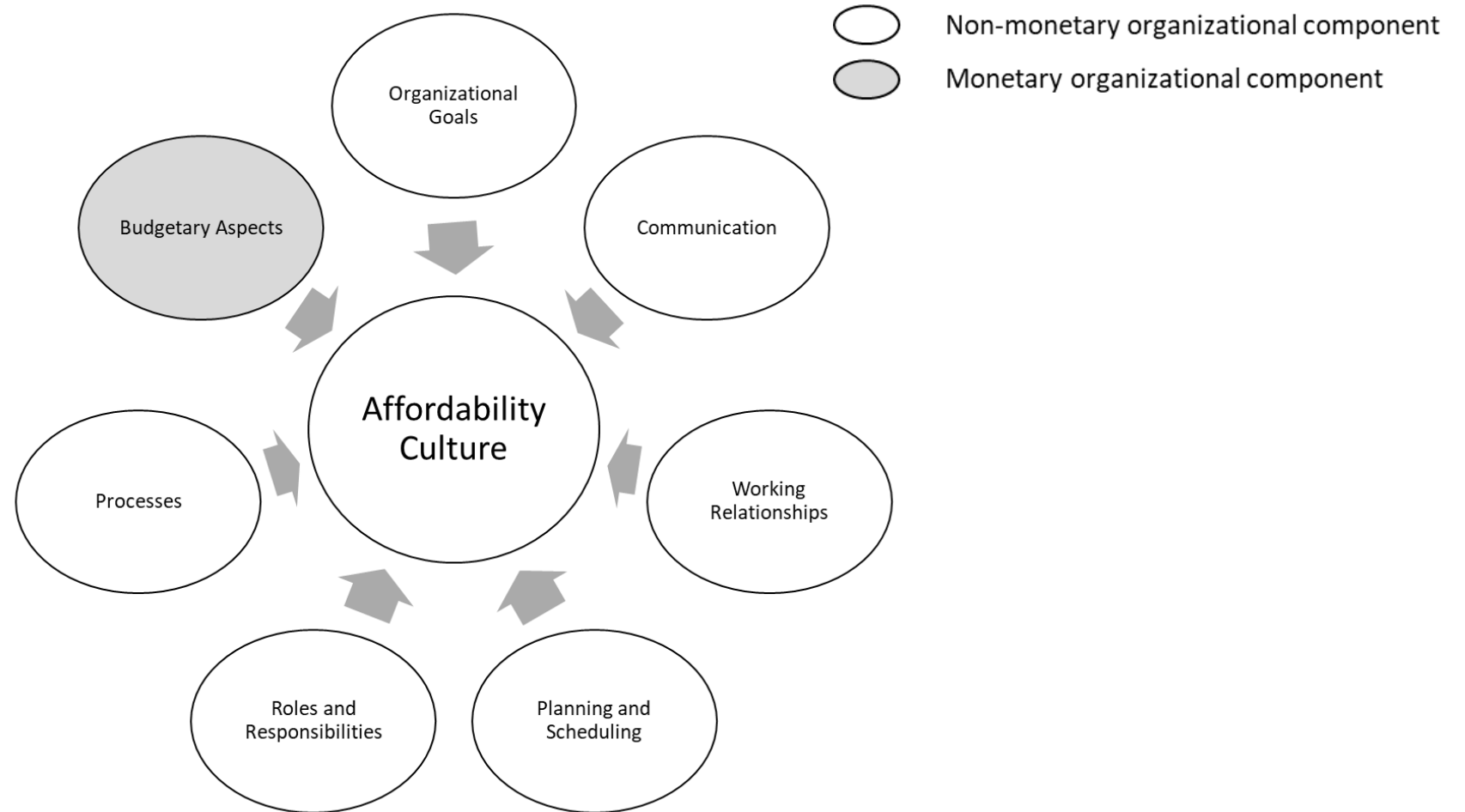
Organizational Components

Organizational Component	Potential Impacts to Affordability	Source
Organizational Goals	Goal ambiguity as a significant predictor of organizational turnover rates	Jung, 2010
	Clarity of goals associated with higher levels of performance and organizational commitment	Moon, 2000; Rainey, 1997
Communication	Poor communication associated with productivity and financial losses	Grossman, 2011
	Effective communication linked with higher total returns to shareholders	Grossman, 2011
Working Relationships	Low quality leader-member exchange associated with organizational vulnerability in terms of performance, turnover intentions, and actual turnover	Bauer et al., 2006
Planning and Scheduling	Planning and scheduling associated with organizational financial efficiency	Perthame et al., 2017
	Planning and scheduling associated with employee retention and turnover rates	Banaszak-Holl et al., 2015
	Planning and scheduling influence organizational performance and success	Aldrich & Pullman, 2019
	Scheduling issues and delays associated with cost overruns as well as adverse effects on working relationships & monetary resources	Ahmed et al., 2002; Chidambaram et al., 2012

Organizational Components

Organizational Component	Potential Impacts to Affordability	Source
Roles and Responsibilities	Workforce training beneficial for role clarity & profession development though costly for organizations	Freifeld, 2020
	Duplication of work as a waste of financial resources	Bandara, 2021; Fervers et al., 2006
	Role ambiguity associated with turnover intention	De Clercq & Belausteguigoitia, 2017; Shin et al., 2020
Efficiency in Processes	Waste as a drain of profitability	Gay, 2022
Budgetary Aspects of Affordability	Budget impact analysis utilized to determine affordability	Mauskopf, 2014
	Affordability assessed relative to budget	Brueckner & Lall, 2015

Organizational Components of an Affordability Culture



Research Objective

- Goal: to gain a better understanding of perceptions of affordability regarding affordability practices and currently existing affordability cultures
- Survey sent to NASA MSFC, industry members, student respondents at UAH
- Responses compared to examining potential differences or similarities in perceptions of organizational behaviors relating to affordability

Methods

Participants

- 171 NASA MSFC employees
- 143 currently employed student participants
- 32 industry participants

Materials

- Qualtrics to administer survey
- SONA for student participants
- Personal device

Survey

- 4 open ended questions
- 17 questions from OCM
- 13 questions from POCF
- 15 original questions
- Demographics

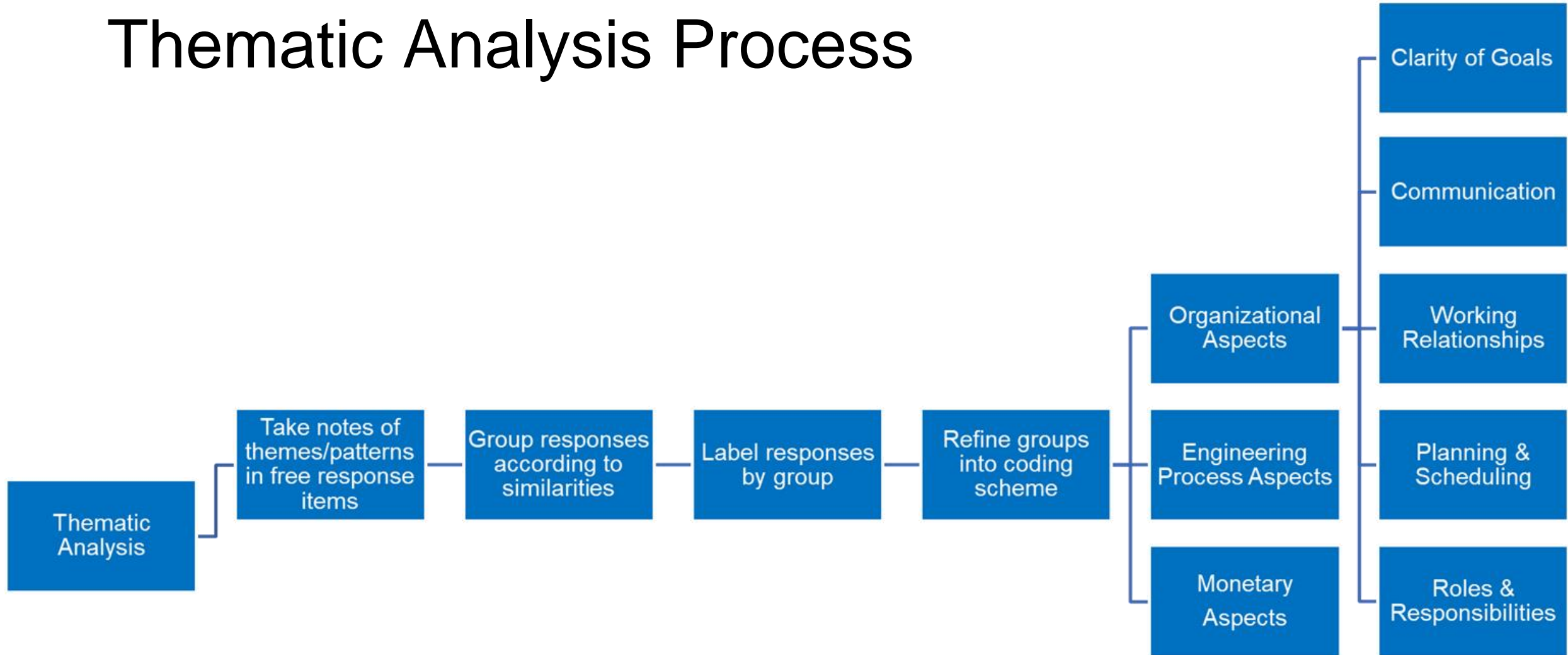
Procedure

- NASA & Industry sent link via email
- Students signed up via SONA
- 1 hour to complete survey online
- Debriefing

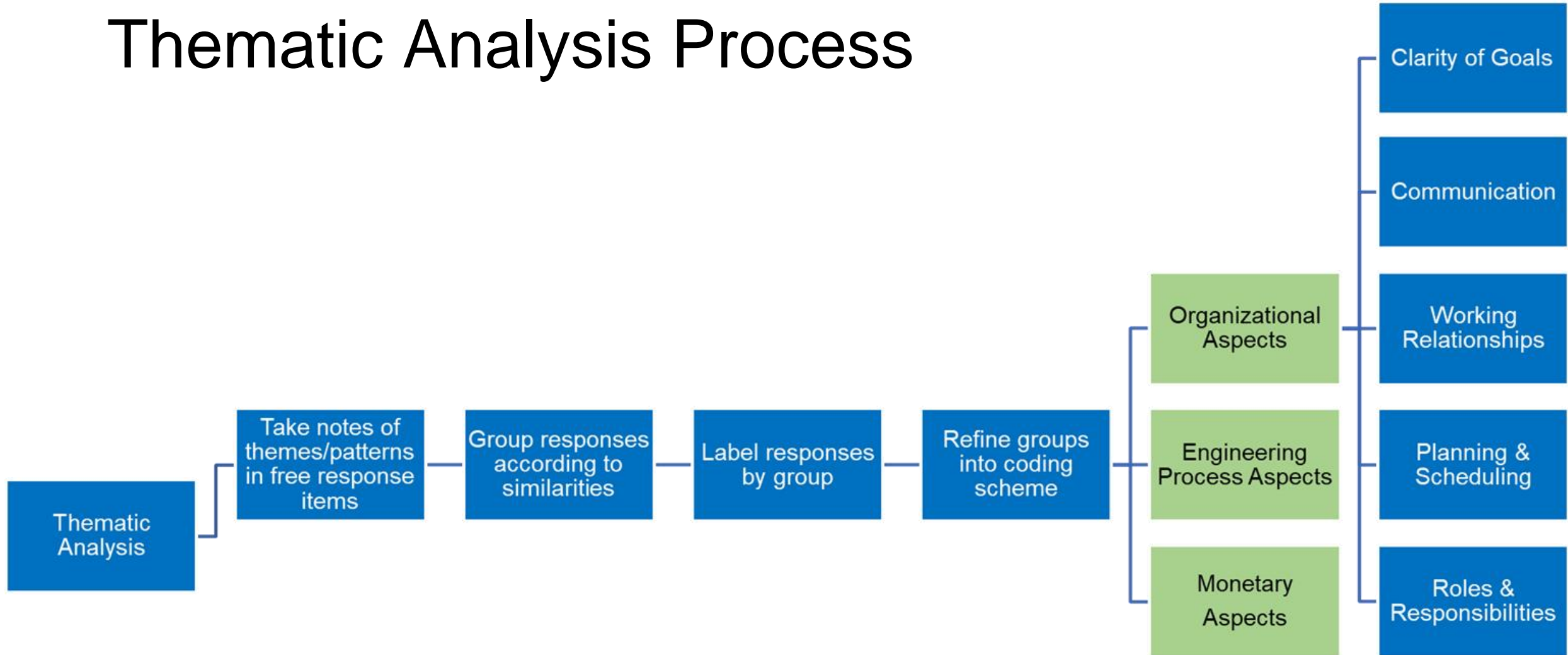
Results: NASA x Industry x Student Comparison

Affordability Grouping	Kruskal-Wallis H	p	NASA Median	Industry Median	Student Median
Clarity of Organizational Goals	2.49	.288	Slightly Agree	Slightly Agree	Slightly Agree
Efficiency in Communication	0.27	.987	Slightly Agree	Slightly Agree	Slightly Agree
Effective Working Relationships	.691	.708	Slightly Agree	Slightly Agree	Slightly Agree
Efficiency in Planning & Scheduling	5.86	.053	Slightly Disagree	Slightly Disagree	Neutral
Clarity of Roles & Responsibilities	1.67	.433	Slightly Agree	Slightly Agree	Slightly Agree
Efficiency in Processes	7.88	.019	Slightly Agree	Slightly Agree	Slightly Agree
Budgetary Aspects of Affordability	79.26	.000	Slightly Disagree	Neutral	Slightly Agree

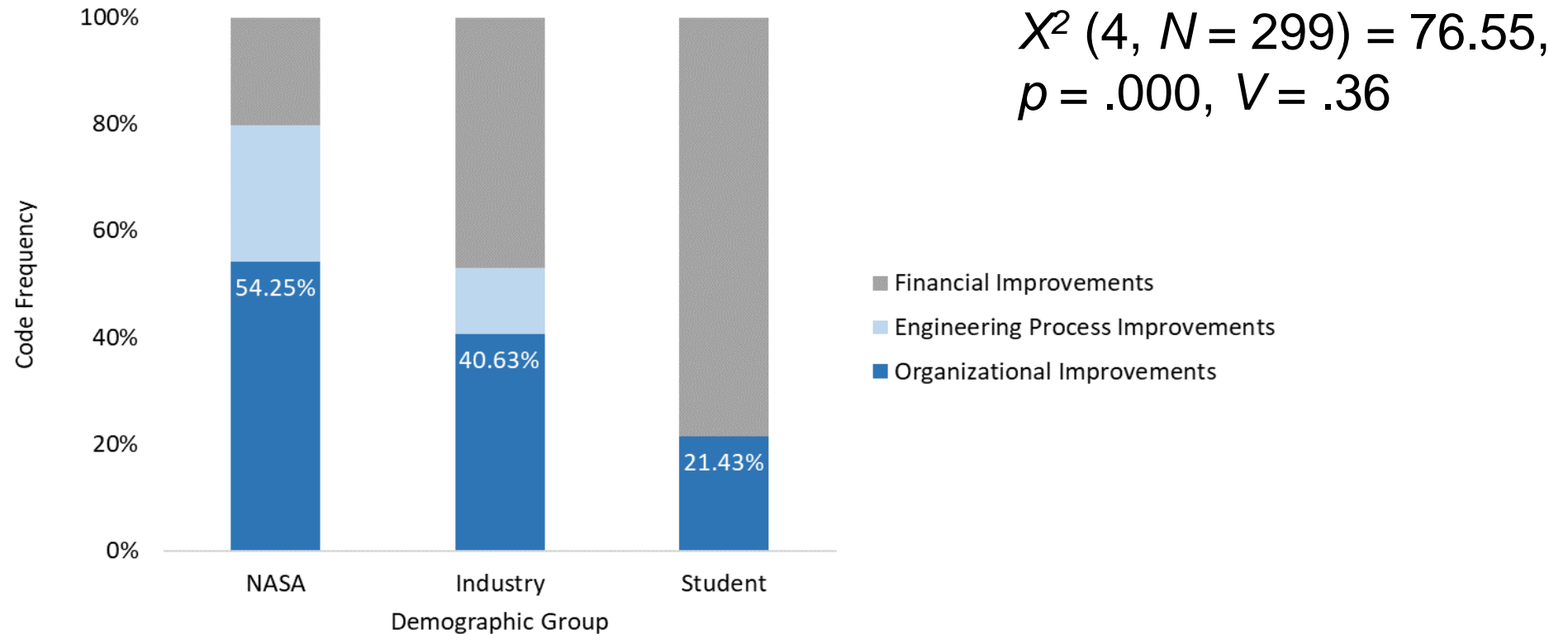
Thematic Analysis Process



Thematic Analysis Process

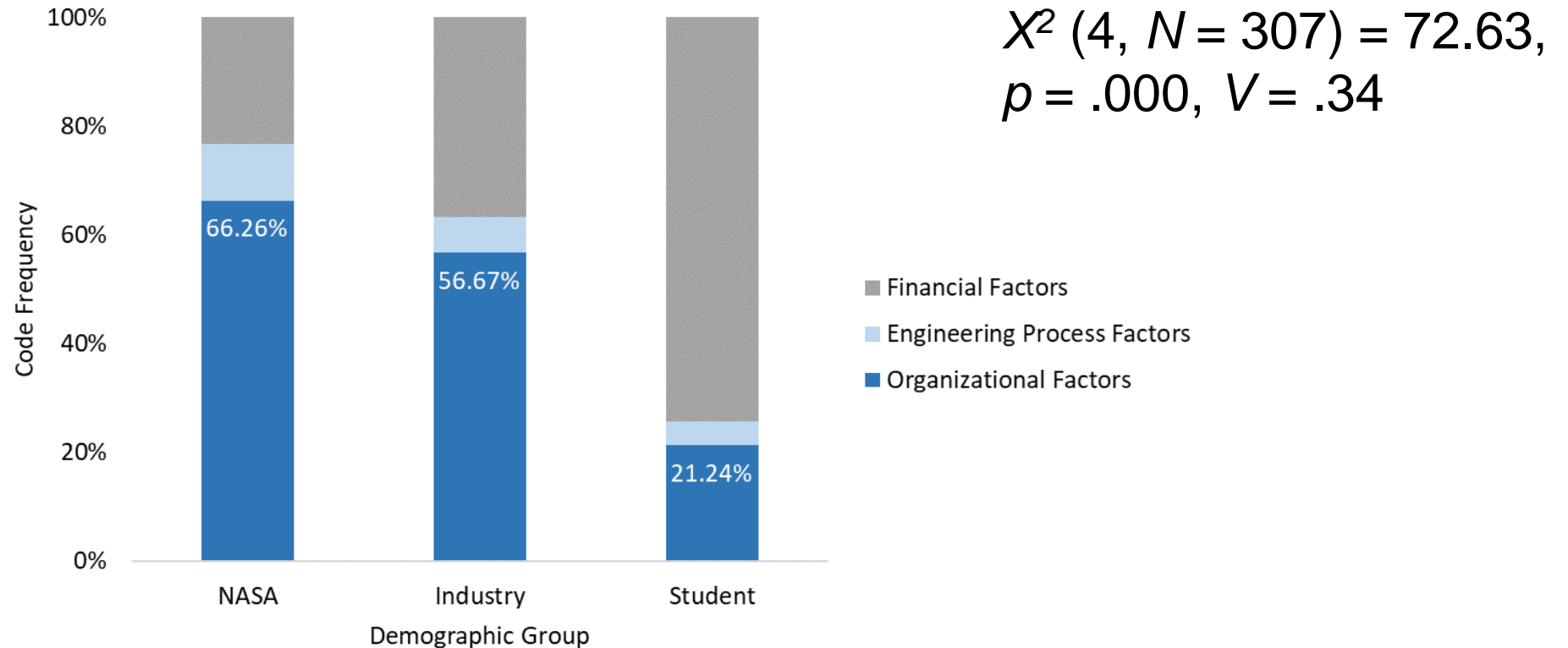


Free Response Results: Comparison of Improvement



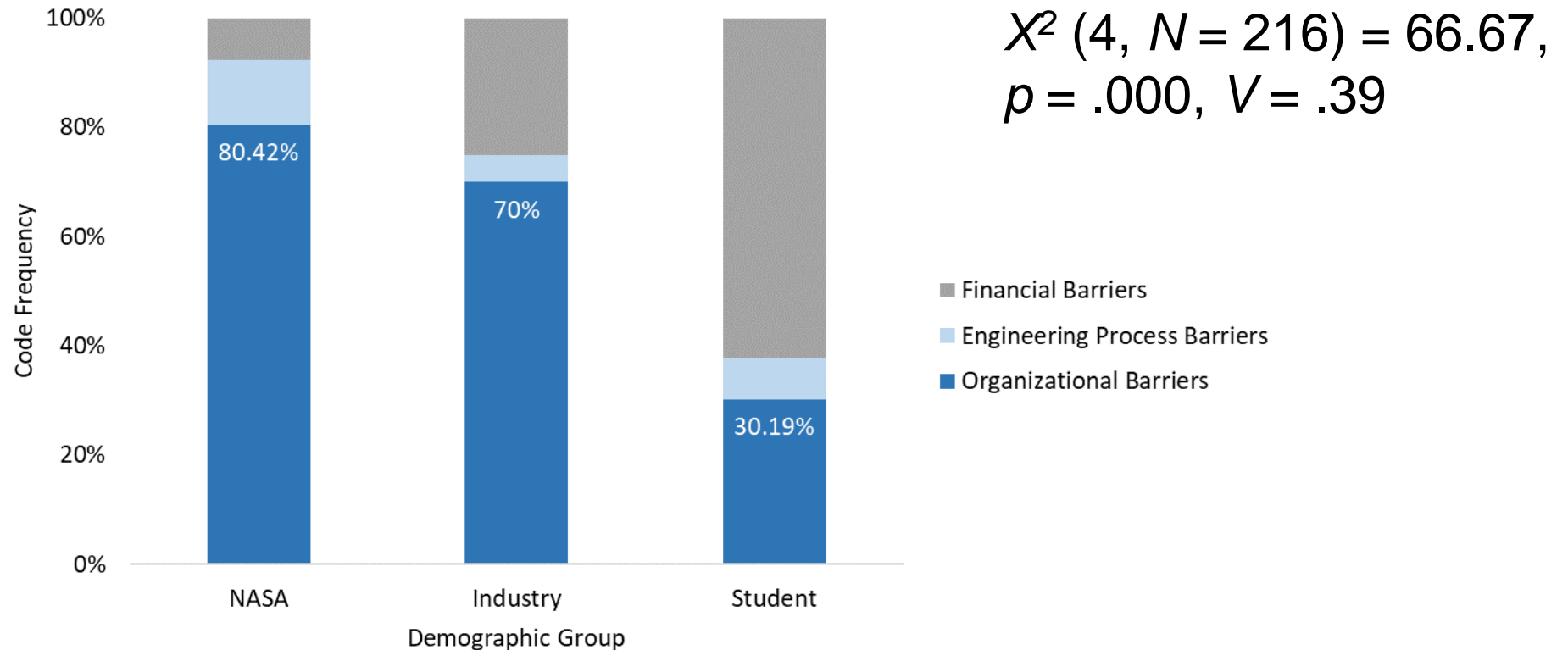
NASA & Industry predominantly suggesting organizational improvements, Students suggesting financial improvements

Free Response Results: Comparison of Cultural Wants



NASA & Industry predominantly suggesting organizational benefits, Students suggesting financial benefits

Free Response Results: Comparison of Cultural Barriers



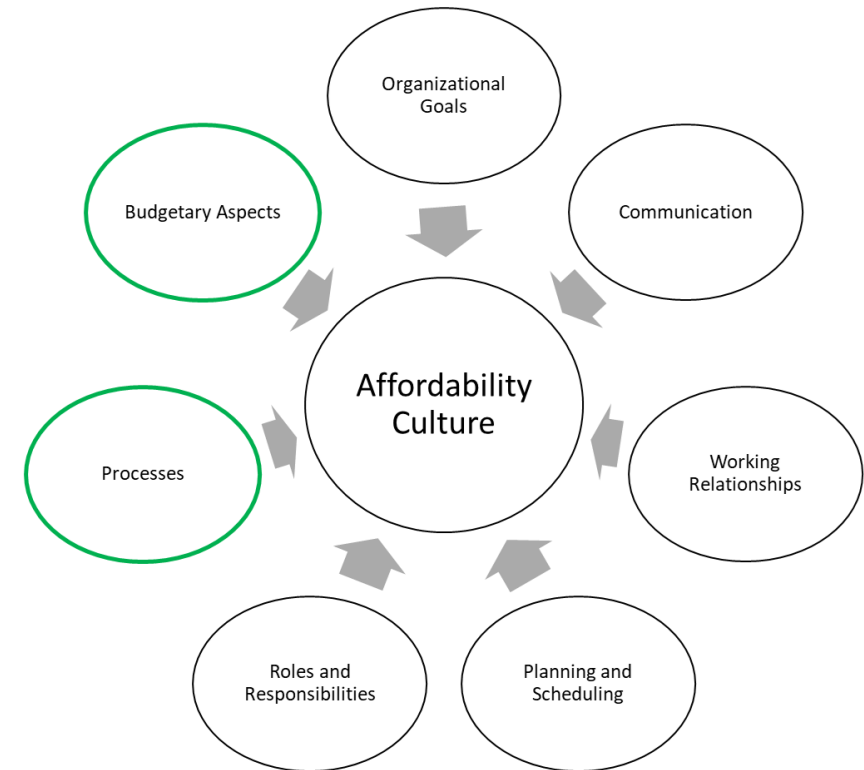
NASA & Industry predominantly suggesting organizational barriers, Students suggesting financial barriers

Affordability Across Organizations

- Significant group differences when prompted regarding affordability improvement, wants for an affordability culture, and cultural barriers
 - NASA and industry similar, focusing on organizational aspects
 - Students tended to focus on financial aspects
- No significant group differences in Likert ratings of organizational behaviors suggest perceptions of non-monetary aspects align with one another
 - Differences may exist on item-level

Organizational Components of an Affordability Culture

- Similar to OCM and POCF, decomposes an organization into components to evaluate perceptions surrounding current practices
 - Expands to focus specifically on organizational components of an affordability culture



Application for Practitioners

- Survey of employees allows organizations to evaluate perceptions of current practices related to affordability
- Specific areas of concern within an organization can be pinpointed to direct focus efforts
- Newly graduated students and those early in career may not understand affordability as an organizational concept
 - Onboarding efforts may benefit from including organizational expectations regarding affordability



Limitations & Future Work

- Sample size & population
 - Future work to focus on industry and NASA
 - Larger population to validate model
- Survey research approach
 - Long surveys resulting in fatigue
- Nature of affordability
 - Lack of willingness to share beliefs

Conclusion

- When evaluating an organization's current affordability practices, perceptions were measured across various organizational domains related to affordability
 - Goals, communication, working relationships, planning and scheduling, roles and responsibilities, engineering processes
- Students tended to view affordability in terms of finances, industry and NASA viewed in terms of organizational impact



References

- Ahmed, S., Azher, S., Castillo, M. and Kappagantula, P. (2002) Construction delays in Florida; an empirical study, Florida. [http://www.cm.fiu.edu/publication/Delays .pdf](http://www.cm.fiu.edu/publication/Delays.pdf)
- Aldrich, P., & Pullman, A. (2019). *Building an Outstanding Workforce: Developing People to Drive Individual and Organizational Success*. Kogan Page Publishers.
- Annarelli, A., Battistella, C., Borgianni, Y., & Nonino, F. (2018). Estimating the value of servitization: A non-monetary method based on forecasted competitive advantage. *Journal of Cleaner Production*, 200, 74-85.
- Armengaud, E., Sams, C., Von Falck, G., List, G., Kreiner, C., & Riel, A. (2017). Industry 4.0 as digitalization over the entire product lifecycle: Opportunities in the automotive domain. *Systems, Software and Services Process Improvement. EuroSPI 2017. Communications in Computer and Information Science*, 748. https://doi.org/10.1007/978-3-319-64218-5_28
- Balthazard, P., & Cooke, R., & Potter, R. (2006). Dysfunctional culture, dysfunctional organization: Capturing the behavioral norms that form organizational culture and drive performance. *Journal of Managerial Psychology*, 21, 709-732. [10.1108/02683940610713253](https://doi.org/10.1108/02683940610713253).
- Banaszak-Holl, J., Castle, N. G., Lin, M. K., Shrivastwa, N., & Spreitzer, G. (2015). The role of organizational culture in retaining nursing workforce. *The Gerontologist*, 55(3), 462-471.
- Bandara, H. (2021). How to prevent duplication of work: Best practices and templates. *Creately Blog*. <https://creately.com/blog/project-management/how-to-prevent-overlapping-and-duplication-of-work/#:~:text=Duplication%20of%20work%20happens%20due,have%20collaborated%20and%20researched%20together>.
- Bauer, T. N., Erdogan, B., Liden, R. C., & Wayne, S. J. (2006). A longitudinal study of the moderating role of extraversion: Leader-member exchange, performance, and turnover during new executive development. *Journal of Applied Psychology*, 91(2), 298–310. <https://doi-org.elib.uah.edu/10.1037/0021-9010.91.2.298>
- Brueckner, J. K., & Lall, S. V. (2015). Cities in developing countries: fueled by rural–urban migration, lacking in tenure security, and short of affordable housing. *Handbook of regional and urban economics*, 5, 1399-1455.
- Cameron, K. S., & Quinn, R. E. (2011). *Diagnosing and Changing Organizational Culture: Based on the Competing Values Framework* (3rd ed.). San Francisco: Jossey-Bass.
- Chidambaram, R., Narayanan, S. P., & Idrus, A. B. (2012). Construction delays causing risks on time and cost-a critical review. *The Australasian Journal of Construction Economics and Building*, 12(1), 37-57.
- Cooper, M. D. (2000). Towards a model of safety culture. *Safety Science*, 36(2), 111–136. [https://doi.org/10.1016/s0925-7535\(00\)00035-7](https://doi.org/10.1016/s0925-7535(00)00035-7)
- De Clercq, D., & Belausteguigoitia, I. (2017). Reducing the harmful effect of role ambiguity on turnover intentions: The roles of innovation propensity, goodwill trust, and procedural justice. *Personnel Review*, 46(6), 1046-1069.
- Fervers, B., Burgers, J. S., Haugh, M. C., Latreille, J., Mlika-Cabanne, N., Paquet, L., & Burnand, B. (2006). Adaptation of clinical guidelines: literature review and proposition for a framework and procedure. *International Journal for Quality in Health Care*, 18(3), 167-176.



References

- Freifeld, L. (2020). Training Industry Report. Training Magazine. <https://trainingmag.com/2020-training-industry-report/>
- Gay, C. (2022). 8 wastes of Lean Manufacturing. MachineMetrics. <https://www.machinemetrics.com/blog/8-wastes-of-lean-manufacturing>
- Grossman, D. (2011). The Cost of Poor Communications. The Holmes Report.
- Hartnell, C. A., Ou, A. Y., & Kinicki, A. (2011). Organizational culture and organizational effectiveness: A meta-analytic investigation of the competing values framework's theoretical
- Jordan, M. H., Lindsay, D. R., & Schraeder, M. (2012). An examination of salient, non-monetary, factors influencing performance in public sector organizations: A conceptual model. *Public Personnel Management*, 41(4), 661-684.
- Jung, C. S. (2010). Predicting organizational actual turnover rates in the US federal government. *International Public Management Journal*, 13(3), 297-317.
- Mauskopf, J. (2014). Budget-Impact Analysis. In *Encyclopedia of Health Economics* (pp. 98–107). RTI International, NC, USA.
- Moon, M. J. (2000). Organizational commitment revisited in new public management: Motivation, organizational culture, sector, and managerial level. *Public Performance & Management Review*, 177-194.
- Ngcobo, S., & Naidoo, V. (2015). Effectiveness of non-monetary factors on staff retention within the South African banking sector. *Dear Readers!*, 4(1), 19.
- Perthame, B., Ribes, E., Touahri, K., & Salort, D. (2017). A model for cost efficient Workforce Organizational Dynamics and its optimization. arXiv preprint arXiv:1707.05056.
- Quinn, R.E. and Rohrbaugh, J. (1983), "A spatial model of effectiveness criteria: towards a competing values approach to organizational analysis", *Management Science*, 29(3), 363-377
- Rainey, H. (1997). *Understanding and managing public organizations*. San Francisco: Jossey-Bass
- Redmond, J., & Sharafizad, J. (2020). Discretionary effort of regional hospitality small business employees: Impact of non-monetary work factors. *International Journal of Hospitality Management*, 86, 102452.
- Safie, F. M., Stutts, R. G., & Broussard, S. K. (2014, January). Reliability and Maintainability—Key to launch Vehicle affordability. In *2014 Reliability and Maintainability Symposium* (pp. 1-6). IEEE.
- Schaffner, M. A., Shihong, M. W., Ross, A. M., & Rhodes, D. H. (2013). *Enabling design for affordability: an epoch-era analysis approach*. MASSACHUSETTS INST OF TECH CAMBRIDGE.
- Shin, Y., Hur, W. M., Park, K., & Hwang, H. (2020). How managers' job crafting reduces turnover intention: The mediating roles of role ambiguity and emotional exhaustion. *International journal of environmental research and public health*, 17(11), 3972.
- Van Maanen, J. V. and S. R. Barley (1984). Occupational Communities: Culture and Control in Organizations. *Research in Organizational Behavior* 6, 287-365.



Questions?

