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Open Government Data Adoption and Implementation Research: A Meta-Analysis

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Abstract:

Open Government Data (OGD) is catalyzed with advances in electronic government, digital technologies, and citizen's sense of ownership over the last decade. Earlier OGD studies has applied different theoretical bases to explore organization's behavior to adopt or implement OGD but has also produced uneven results. This study combines various theoretical bases and conducts weight and meta-analysis in OGD research. Further, an interconnected model of existing factors impacting OGD adoption or implementation is portrayed by synthesizing empirical results in OGD studies. Inconsistencies in the level of effect and significance among several factors within empirical OGD studies at organizational level (represented by decision-makers) provide the basis for conducting a weight and meta-analysis. Therefore, the main purpose of this study is to carry out weight and meta-analysis of all factors for confirming their overall influence on adoption or implementation of OGD. The results of this study suggest that organizational capacity, external pressures, and organizational readiness are found to be significant factors of adoption behavior. While implementation intention, organizational arrangement, technical capacity, and organizational awareness are the significant factors of implementation behavior of OGD. The recommendations drawn from this research would help to decide if and when to use such antecedents for predicting adoption and implementation of OGD.

Keywords: Open Data; Open Government Data; Adoption; Implementation; Public Sector Organizations

Introduction

- “Open government data refer to making any public sector data and information available in formats and ways that enable free access, use and distribution and facilitate exploitation.” ([Wirtz et al., 2016](#))
- OGD improves economic growth, transparency, and accountability in organizations ([Wang and Shepherd, 2019](#)).
- It increases participation, collaboration, decision-making and policy development ([Kleiman et al., 2020a](#)).
- OGD is still at infancy stage.
- Scholarly literature on OGD is emerging but not matured yet.
- Despite the significant benefits of OGD to date, only a few methodical and comprehensive studies have been undertaken on OGD.

Introduction

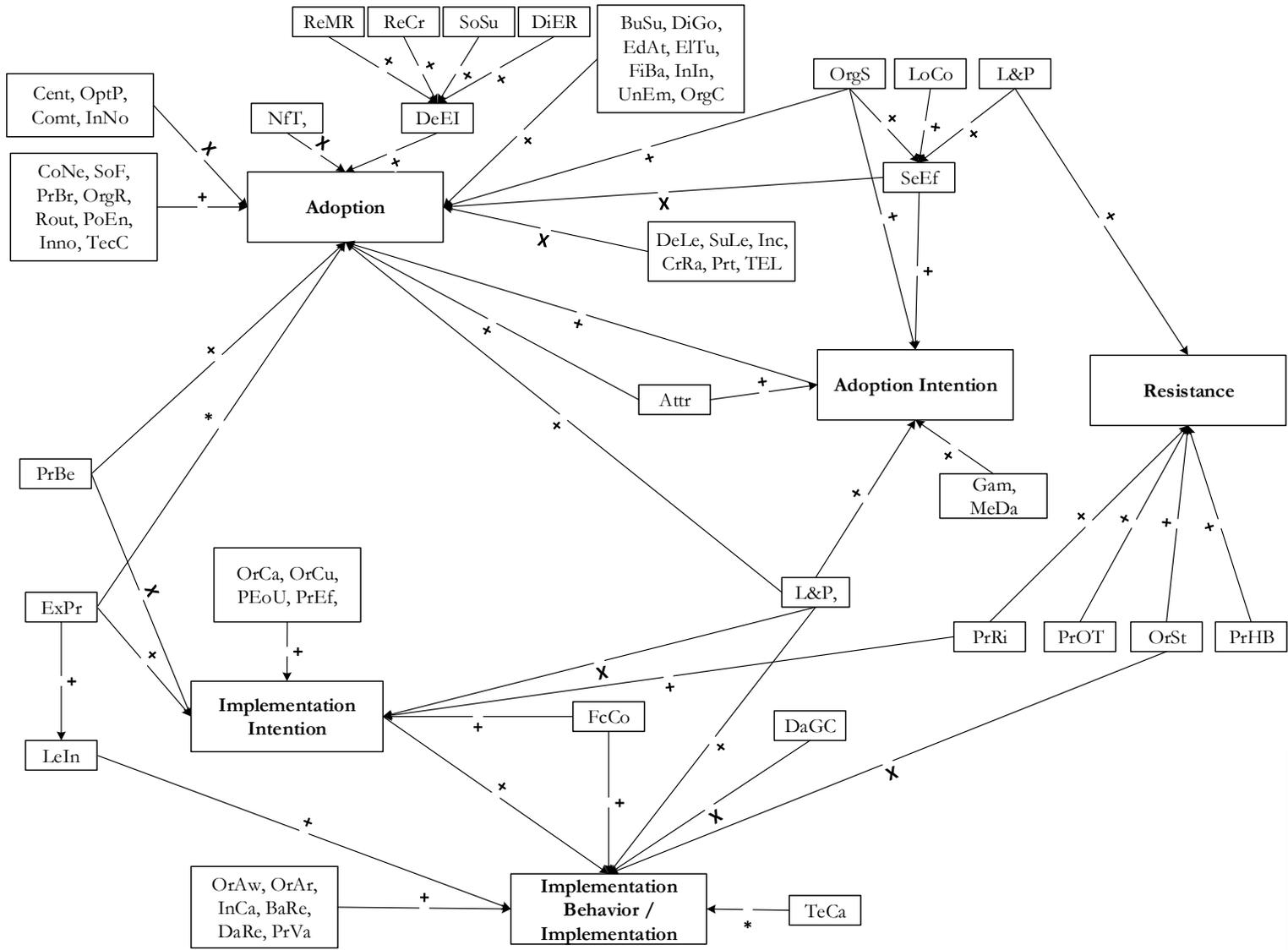
- Although research on OGD is being explored across different countries, the authenticity and consistency of the various theoretical approaches being used in OGD adoption and implementation research has yet to be examined.
- No study made collective design of factors to determine the trend of OGD adoption in public sector.
- No attempt has been made towards performing a comprehensive meta-analysis of the existing empirical publications.
- In order to understand the OGD publication and progression of research models, *the aim of this study is to perform a weight analysis and to undertake a meta-analysis of findings reported in existing research on the adoption and implementation of OGD.*

Methodology

- In order to accomplish the research aim, both the review and meta-analysis approaches have been used.
- Searched articles related to Open Government Data.
- Keywords used 'Open Data', 'Open Government Data', 'OGD', 'adoption', 'publication', 'publishing', 'implementation', 'public sector', in all possible permutations and combinations.
- Logical operators AND and OR are used.
- Online databases such as Pakistan Research Database, Web of Science, and Scopus were used.
- In total, 83 publications were found.
- 13 studies used a range of different constructs to investigate quantitatively.

Results

Constructs' Relationships



Results

Weight Analysis (Adoption)

Table 1. Weight analysis of the most frequently used relationships regarding OGD Adoption (Approach adapted from: Jeyaraj *et al.* (2006))

Independent Variable	Dependent Variable	Sig	Not-Sig	Total	Weight (Sig/Total)
Organizational Capacity	Adoption Behavior	2		2	1.00
External Pressures	Adoption Behavior	2	1	3	0.67
Organizational Readiness	Adoption Behavior	3		3	1.00

Results

Weight Analysis (Implementation)

Table 2. Weight analysis of the most frequently used relationships regarding OGD Implementation (Approach adapted from: Jeyaraj *et al.* (2006))

Independent Variable	Dependent Variable	Sig	Not-Sig	Total	Weight (Sig / Total)
External Influence	Implementation Intention	2	0	2	1.00
Facilitating Condition	Implementation Intention	2	0	2	1.00
Organizational Capability	Implementation Intention	2	0	2	1.00
Perceived Risks	Implementation Intention	2	0	2	1.00
Perceived Usefulness	Implementation Intention	2	0	2	1.00
Perceived Effort	Implementation Intention	2	0	2	1.00
Implementation Intention	Implementation Behavior	2	0	2	1.00
Institutional capacity	Implementation Behavior	2	0	2	1.00
Organizational arrangement	Implementation Behavior	3	0	3	1.00
Technical Capacity	Implementation Behavior	2	1	3	0.67
Awareness	Implementation Behavior	2	0	2	1.00

Results

Meta-Analysis Studies

Table 3. Studies used in the Meta-Analysis and their Details

Author(s)	Country	Data Collection Method	Unit of Analysis	Sample Size
(Chen et al., 2019)	US	Documentary Analysis	State	50, 350
(Grimmelikhuijsen and Feeney, 2017)	US	Survey and Content Analysis	City Government Managers AND Local Government Websites	790, 500
(Wang and Lo, 2016)	Taiwan	Survey	Organizations	342
(Yang and Wu, 2016a)	Taiwan	Survey	Organizations	284
(Sayogo and Pardo, 2012)	North America, Europe, Other Regions	Survey	Individuals (including decision-makers)	587
(Zhao and Fan, 2018)	China	Survey	Individuals	191
(Yang and Wu, 2020)	Taiwan	Survey	Organizations	436
(Fan and Zhao, 2017)	China	Government Websites and Internal Meeting Documents	Govt Departments	128
(Wirtz et al., 2016)	Germany	Survey	Organization Employees	265
(Zhenbin et al., 2019)	Singapore	Survey	CIOs, IT Directors and Managers	102
(Choi, 2017)	Korea	Survey	Public Agencies	52
(Kleiman et al., 2020a)	Europe	Game set-up and quasi-experiment	Civil Servants	77
(Zhao and Fan, 2021)	China	Survey	Public Servants	237

Results

Moderator Variables and their Categories

Table 4. Moderator Variable and Categories

Moderator Variable	Category
Year or open data experience	Categorical
Pressure from higher-level governments	Continuous
Public pressure	Continuous
Power Distance	Continuous
Uncertainty Avoidance	Continuous
Organizational Awareness	Continuous
Organizational Readiness	Continuous
Institutional Capacity	Continuous

Discussion

- When the weight of a factor (independent variable) is high, its significance corresponding to dependent variable may be considered high.
- Organizational capacity, external pressures, organizational readiness are the significant factors of OGD adoption behavior.
- External influence, facilitating condition, organizational capability, perceived risks, perceived usefulness, and perceived effort are the significant predictors of implementation intention.
- Implementation intention, institutional capacity, organizational arrangement, technical capacity, and organizational awareness are the significant predictors of implementation behavior.
- Year or open data experience, pressure from higher-level governments, public pressure, power distance, uncertainty avoidance, organizational awareness, organizational readiness, and institutional capacity are the moderator variables.

Limitations and Future Research Directions

- Only Weight Analysis was performed.
- Meta-Analysis on zero-order random correlations is to be performed.
- No longitudinal study exists in OGD adoption literature.
- Some other models, which were only presented and not empirically investigated, are not included in the current study such as ([Hossain and Chan, 2015](#)) and ([Khurshid et al., 2020](#)).

Conclusions

This OGD research allowed the researchers to identify the theoretical gaps in the existing knowledge and would suggest the further lines of research in this area about the possible pattern of constructs and their overall performance.