

Implementation and Outcomes:

Evidence from Information Kiosks in Rural India

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'Traditional' interactions between stakeholders



- **Policy can facilitate the availability of relevant data for research**
- **Research can engage more closely with practice to enable systems to collect data**
- **Practitioners can set the research agenda; participate in policy forums**

Presentation outline

- **Using a concrete example: The implementation of a large scale program to deploy information kiosks in rural India demonstrate:**
 1. The need for implementation research
 2. The existing 'knowledge gap' with regard to implementation
 3. Practical requirements for implementation research
 4. Methodological caveats in empirical research on implementation
 5. Summarize recommendations from the analysis of information kiosks for:
 - Policy
 - Practice
 - Research

Focus: Use of ‘information kiosks’ in rural India

A basic definition

- Point of public access to the Internet and IT-services in remote and rural areas



Three tier business model

- Franchisor (headquartered in the city): Internet provider
- Local Service Partner (at each district office): Local technical support
- Kiosk Franchisee (in every village): Points of delivery of IT-based services

Existing studies to understand usage

- Demand side:
 - Socio-economic variables: education, income, gender/cultural factors
 - Population size
- Supply side:
 - Business models
 - Locally appropriate technologies and services
 - Entrepreneurial talent
- Institutional factors:
 - Spatial planning of deployments
 - Links with the government
- Role of implementation not considered

Implications of overlooking implementation

➤ Research

- Outcomes attributed within available set of observed variables
- Ex: In the case of new products (insurance) or services (technology-based), poor outcomes ascribed to the state of the market (low level of purchasing power; illiteracy). However, hasty implementation could have played a part

➤ Policy

- False rejection of a project that has been poorly implemented
- False selection of a project that has required extraordinary efforts for success

➤ Practitioners

- No useful/practical information on what to do next or better

Why is there a knowledge gap?

- Implementing organizations:
 - Don't have systems to routinely capture implementation related data
- Researchers:
 - Typically distanced from operations side in survey research
 - Sensitivity issues with sharing data
- The result:
 - Data on implementation limited for analysis

The practical solution to facilitate research

- A closer engagement between practitioners and researchers:
 - To identify implementation 'levers'
 - Assist in setting up a system to collect relevant internal data
- Necessary for organizations in monitoring and feedback as they grow in size and expand geographically
- Achievable at a relatively low cost and effort

Analysis: Identifying implementation ‘shocks’

- Outcome variable:
 - Average number of customers per week
- Explanatory variables:
 - Implementation ‘shocks’
 - Power outages
 - Internet connectivity disruptions
 - Hardware repairs requiring technical assistance
 - Additional investment over the life of the business
 - Marketing expenditure
- Panel data: Firm-level fixed-effects model (robust set of controls)
 - Short run (three quarters)
 - Long run (additional year: a total of seven quarters) – to corroborate results; investigate implications of sample attrition

Short run: Implementation shocks are significant

Variables	-1	-2	-3	-4
Power outages	0.009	-0.016	-0.21	0.091
	0.04	0.09	0.5	0.29
Internet disruptions	-1.148*	-0.27	-0.528	-0.412
	1.88	0.56	0.53	0.41
Hardware repairs	-1.874**	0.226	-2.260**	-1.69
	2.53	0.43	2.07	1.55
Marketing activity	2.157***	0.425	3.472***	1.757*
	3.13	0.74	2.92	1.72
Investment	0.656***	0.034	0.941**	-0.43
	2.82	0.13	2.19	1.05
Quarter 2	0.062	-0.394	0.038	-0.623
	0.11	0.51	0.07	0.76
Quarter 3	0.274	0.208	0.234	-0.17
	0.51	0.27	0.43	0.21
Quarter 4		-2.498***		
		3.13		
Quarter 5		-1.754**		
		2.21		
Quarter 6		-0.983		
		1.23		
Quarter 7		-0.558		
		0.69		
S_Power outages			0.3	
			0.6	
S_Internet disruptions			-1.006	
			0.8	
S_Hardware repairs			0.858	
			0.57	
S_Marketing activity			-1.988	
			1.36	
S_Investment			-0.4	
			0.78	
Constant	7.533***	8.052***	7.566***	8.589***
	-12.48	11.84	12.42	9.1
Observations	396	523	396	228
Number of firms	132	76	132	76
Number of quarters	3	7	3	3

Long run: Implementation shocks disappear

Variables	-1	-2	-3	-4
Power outages	0.009	-0.016	-0.21	0.091
	0.04	0.09	0.5	0.29
Internet disruptions	-1.148*	-0.27	-0.528	-0.412
	1.88	0.56	0.53	0.41
Hardware repairs	-1.874**	0.226	-2.260**	-1.69
	2.53	0.43	2.07	1.55
Marketing activity	2.157***	0.425	3.472***	1.757*
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Is there an attrition bias?

- Attrition bias is likely to occur when the outcome variable of interest is correlated with attrition
 - Likely when considering firm performance and exit
- When considering implementation we might further expect:
 - Those who dropped out faced more shocks related to implementation
 - The model as a whole is systematically different for non survivors relative to survivors due to observable and unobservable factors that make these firms intrinsically less resilient

Were the shocks faced different?: No

Variable	Round	Sample Group	Observations	Mean	SD	t-statistic	p-value
Power outages	1	Non Survivors	56	.946	1.271	-1.3425	0.1818
		Survivors	76	1.316	1.745		
		Total Sample	132	1.159	1.567		
	2	Non Survivors	56	.893	1.344	-1.744	0.0835
		Survivors	76	1.303	.1522		
		Total Sample	132	1.129	1.345		
	3	Non Survivors	56	1.036	.7619	-3.4756	0.0007
		Survivors	76	1.553	.900		
		Total Sample	132	1.333	.880		
Hardware breakdowns	1	Non Survivors	56	.214	.414	0.4198	0.7901
		Survivors	76	.276	.450		
		Total Sample	132	.250	.435		
	2	Non Survivors	56	.286	.456	0.6307	0.5293
		Survivors	76	.237	.428		
		Total Sample	132	.258	.439		
	3	Non Survivors	56	.161	.371	-0.7178	0.4742
		Survivors	76	.212	.410		
		Total Sample	132	.189	.393		
Internet disruptions	1	Non Survivors	56	.375	.489	-1.1282	0.2613
		Survivors	76	.474	.503		
		Total Sample	132	.432	.497		
	2	Non Survivors	56	.232	.426	0.1137	0.9096
		Survivors	76	.224	.419		
		Total Sample	132	.227	.421		
	3	Non Survivors	56	.179	.38	-2.5702	0.0113
		Survivors	76	.382	.489		
		Total Sample	132	.295	.458		

Is the model different for survivors?: No

Variables	-1	-2	-3	-4
Power outages	0.009	-0.016	-0.21	0.091
	0.04	0.09	0.5	0.29
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Constant	7.533***	8.052***	7.566***	8.589***
	-12.48	11.84	12.42	9.1
Observations	396	523	396	228
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Is time-specific data causing the difference?: No

	Iteration 1	Iteration 2	Iteration 3	Iteration 4	Iteration 5
Variables	All Rounds	Drop Round 7	Drop Round 6	Drop Round 5	Drop Round 4
Power outages	-0.016	0.112	0.341*	0.207	0.091
	0.09	0.6	1.81	0.91	0.29
Internet disruptions	-0.27	-0.132	-0.036	0.137	-0.412
	0.56	0.26	0.07	0.21	0.41
Hardware repairs	0.226	-0.128	-0.838	-1.551**	-1.69
	0.43	0.23	1.34	2.06	1.55
Marketing activity	0.425	0.6	0.923	1.252*	1.757*
	0.74	0.98	1.48	1.75	1.72
Investment	0.034	-0.023	-0.199	-0.353	-0.43
	0.13	0.09	0.68	1.06	1.05
Quarter 2	-0.394	-0.372	-0.391	-0.446	-0.623
	0.51	0.5	0.55	0.62	0.76
Quarter 3	0.208	0.179	0.057	-0.03	-0.17
	0.27	0.24	0.08	0.04	0.21
Quarter 4	-2.498***	-2.601***	-2.784***	-2.765***	
	3.13	3.37	3.74	3.61	
Quarter 5	-1.754**	-1.786**	-1.853**		
	2.21	2.33	2.5		
Quarter 6	-0.983	-0.952			
	1.23	1.23			
Quarter 7	-0.558				
	0.69				
Constant	8.052***	7.955***	7.939***	8.274***	8.589***
	11.84	11.89	11.78	11.59	9.1

Is there a small sample size problem?: Yes

Variables	-1	-2	-3	-4
Power outages	0.009	-0.016	-0.21	0.091
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Summary of findings for research

- Practical standpoint:
 - Closer engagement with practitioners to set up relevant systems of internal data collection
- Methodological standpoint:
 - Short run panels in conjunction with long run panels
 - To avoid attrition bias or small sample problems
 - Data collection from early stages
 - Sample attrition is often highest in the early stages (especially for small firms)

Findings for practitioners

- Role of Local Service Provider is important in a decentralized service delivery:
 - No research on 'intermediate layer' thus far
 - Technical disruptions in novel technologies might be inevitable BUT prompt resolution would mitigate 'downstream impact'
 - Appropriate recruitment of LSP (qualifications, motivation); system of incentives

Findings for policy

- To enable ‘successful’ rural kiosks – or firms, more broadly – power supply, telecommunications and local support services jointly required:
 - Complementarities in infrastructure provision in order for ‘investments’ in particular infrastructure sectors to translate into improved economic performance
 - Consider a joint strategy across infrastructure
- Facilitating the availability of implementation related data (greater transparency, accountability):
 - Existing moves in this direction in India:
 - Institutionalizing monitoring and evaluation
 - Encouraging citizens’ participation (social audits; exercising ‘right to information’)

Thank you

Appendix slide: Literature on implementation

- Study of implementation came to the fore following the work by Wildavsky and Pressman (1973)
- Political economy of service delivery/governance:
 - Case for greater decentralization
 - Case for privatization
 - Emphasis on greater transparency and accountability
- Study of ‘institutions’ in economics:
 - “Institutions are the rules of the game in a society, or, more formally, they are the humanly-devised constraints that shape human interaction” (North 1990).
 - Range of ‘contextual variables’