Barriers to the Implementation of AI in Organizations: Findings from a Delphi Study

Online Appendix – Literature Review

Informed by our research question, our review of literature was performed in two phases. First, we searched for literature on IT implementation barriers in general. The objective here was to gain a deeper understanding of extant knowledge on this topic as well as to inform the next phase of our literature review. We focused our search in four main databases: ABI/Inform Business Source Complete, IEEE Xplore, Emerald Insight, and Web of Science. Search queries were based on combinations of keywords, including "implementation," "obstacle," "barriers," "technology" as well as variants of those terms. We restricted our search to sources published between 2000 and 2020 and only retained peer-reviewed articles and conference proceedings specifically focusing on IT implementation barriers. This last criterion was assessed based on article titles, abstracts, and a cursory look at the contents. After eliminating duplicate articles and removing articles deemed irrelevant for the topic of our own research, we retained 16 sources on IT implementation barriers. While enterprise resource planning (ERP) systems constituted the bulk of our final sample, we also found articles dealing with customer relationship management (CRM) systems as well as cloud-based technologies (e.g., SaaS). We therefore proceeded to categorize IT implementation barriers by technological artifact during our analysis to extract commonalities and discrepancies across technologies. The table below provides a high-level concept matrix that summarizes our review of literature on IT implementation barriers.

Barriers to implementation of IT																					
Source/Barrier	High costs	Inadequate training	Lack of top management support	Low organizational culture	Inadequate Org. structure	Security & Confidentiality	Lack of technical expertise	Lack of visibility on benefits	Lack of user involvement	Vendor-related problems	Resistance	Complexity	Innovation pace	IT infrastructure	Underperformance of the project team	Ambiguous strategic vision	Absence of process engineering	Technical problems	Lack of sufficient systems for measurement	Low data quality	Low level of technology maturity
Fletcher and Wright (1994	x		x	x	x		x	x			x	x		x							
Munkvold (1996	x	x	x				x				x	x		x							
Huda and Hussin (2010	x	x	x	x	x		x	x	x	x	x	x		x							
Ebrahim and Irani (2005	x	x	x	x		x	x				x	x	x	x							
Beaumaster (2002		x	x	x			x			x	x										
Twinomugisha (2003							x						x	x							
Edington and Shin (2006			x	x			x				x	x		x							
Bingimlas (2009		x	x	x			x	x			x			x							
Sabaliauskas and Pukelis (2004			x				x				x			x							
Zhang (2009								x					x	x							
Bhattacharya (2008			x								x	x									
Searson et al. (2011			x					x													
Yusuf (2007											x	x									

Saatçıoğlu Ömür (2009	x	x	x	x			x			x	x			x	x	x	x	x			
Elmuti et al. (2009			x	x			x	x			x	x							x	x	
Raut et al. (2018			x	x		x		x		x		x		x							x

The second phase of our review of literature focused on AI implementation barriers. To that end, we used the same keywords, but we also included specific terms such as “artificial intelligence,” “deep learning,” “machine learning,” and “neural network.” Unsurprisingly, a high number of search results were unrelated to the implementation of AI as we understand it in IS, and many focused on the technical implementation of AI models. We therefore screened search results and only retained those that dealt with the phenomenon related to our research question. Given the dearth of academic research on this nascent topic, we expanded our search to include professional sources as well (e.g., MIT Sloan Management Review, Harvard Business Review). In total, we retained 6 works specifically focusing on AI implementation barriers, which we summarize in the concept matrix below.

Barriers to implementation of AI																							
Source/Barrier	High costs	Inadequate training	Lack of top management support	Low organizational culture	Inadequate Org. structure	Security & Confidentiality	Lack of technical expertise	Lack of visibility on benefits	Lack of user involvement	Vendor-related problems	Resistance	Complexity	Innovation pace	IT infrastructure	Ambiguous strategic vision	Lack of understanding of what AI is	Ethics issues	Governance issues	Poor identification of clear use case	Low level of technology maturity	Immaturity of the legal environment	Low data quality	Iinsufficient quantity of available data	Responsibility and accountability
Goasduff (2019			x			x	x	x		x	x	x			x	x		x	x	x		x	x	x
Wirtz et al. (2019	x				x	x	x					x					x	x			x	x		x
Faraj et al. (2018											x						x					x	x	x
Broda (2019						x								x									x	
Bergstein (2019	x							x				x												
Ransbotham et al. (2017			x			x	x	x						x					x					

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