



SCHOOL OF BUSINESS

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How does IOS-enabled business intelligence enhance supply chain performance?

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Outline

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Introduction

- Adoption and use of Inter-organizational information systems (IOS) have grown in recent decades, and have become common tool in many sectors.
- IOS are network-enabled information systems that allow organizations to effectively manage business operations and supply chain activities across several organizations (Asamoah et al., 2020).
- Researchers have identified that adoption and use of IOS can be patterned to achieve three possible objectives; to enable communication, to achieve integration, and to enable business intelligence (Zhang and Cao, 2018; Subramani, 2004).
- In the present era of big data where large volumes of business data are created on a daily basis, deploying IOS for business intelligence has become particular relevant.





Motivation

- Exploring and understanding business data can help firms gain new insights into their operations, customers and market, and this can serve as the foundation of higher performance.
- IOS enabled business intelligence promises to foster the ability of an organization to gain and exploit business data for improved organizational performance (Zhang and Cao, 2018).
- Despite the relevance of IOS enabled business intelligence, studies on the area remains nascent (Mandal and Dubey, 2021).
- Again, little is known about the mechanisms through which how IOS enabled business intelligence improves organizational performance (Mandal and Dubey, 2021).



Research Question

- How does IOS-enabled business intelligence enhance supply chain performance?
- This study takes a deeper look into how IOS-enabled business intelligence may enhance the supply chain performance of firms.
- Specifically, we examine the role of information exchange capabilities, coordination capabilities, integration capabilities, and supply chain responsiveness capabilities.





Theoretical Background

- This study is underpinned by the resource-based view (RBV) theory.
- The RBV theory argues that organizations gain competitive advantage, when they must possess resources that are rare, valuable, inimitable, non-substitutable and can be deployed in manner that is difficult for competitor to replicate (Barney, 1991; Peteraf, 1993).
- We postulate that IOS-enabled business intelligence is resource that can help organizations to gain superior performance.
- Grounded on the RBV, the research model of the study traces the effect of IOS-enabled business intelligence on information exchange capabilities, coordination capabilities and integration capabilities, and how these capabilities subsequently impact on supply chain responsiveness and supply chain performance.





IOS-enabled business intelligence

- The extent to which the use of IOS facilitates learning and knowledge creation between members of a supply chain network (Zhang and Cao, 2018).
 - Applications for IOS-enabled business intelligence may take the form of shared database and decision support systems, shared knowledge acquisition, and artificial intelligence (Mandal and Dubey, 2021).

Information exchange capabilities

- The ability of an organization to share relevant information with its supply chain partners effectively and efficiently (Wu et al., 2006; Yeniyurt et al., 2019).





Coordination capabilities

- The ability of organizations to effectively and efficiently coordinate business activities with their supply chain partners (Wu et al., 2006).

Integration capabilities

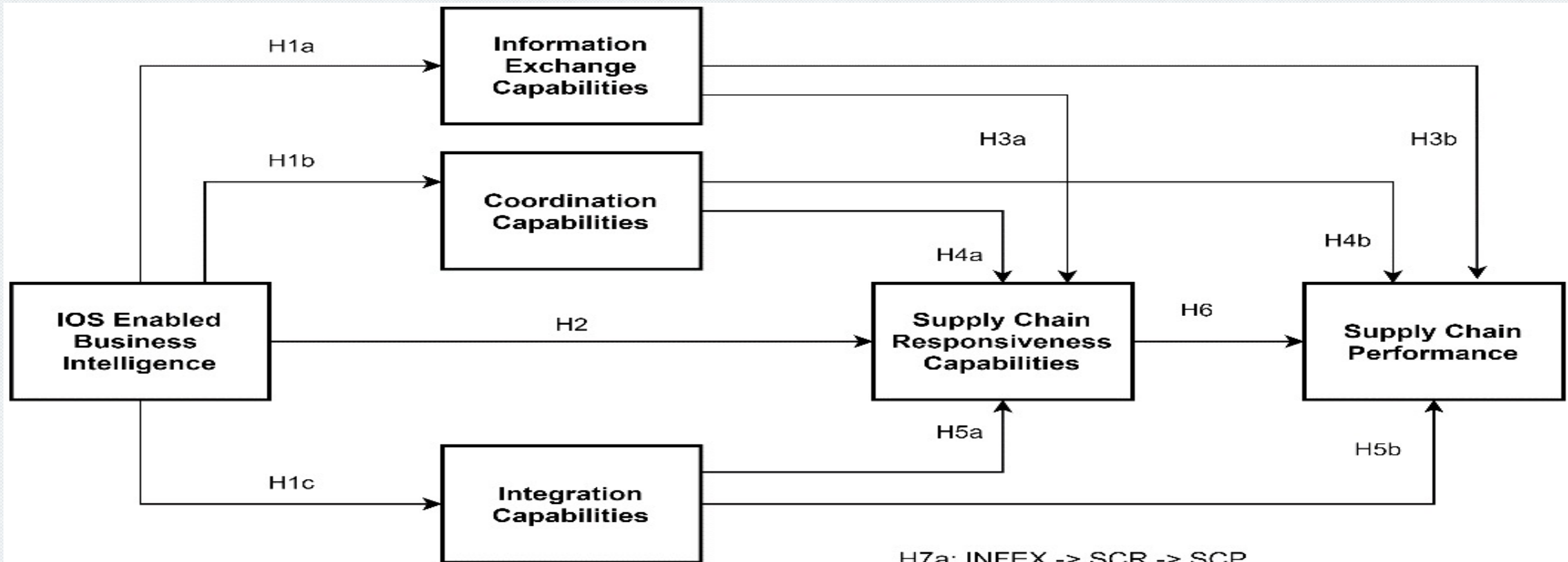
- The ability of organization to efficiently integrate their internal and external supply chain activities.

Supply chain responsiveness capabilities

- The extent to which members of a supply chain are able to cooperatively respond to changes presented by the environment (Wu et al., 2006; Yeniyurt et al., 2019).



Research model and hypotheses



H7a: INFEX -> SCR -> SCP
 H7b: CORD-> SCR -> SCP
 H7c: INTG-> SCR -> SCP





Methodology: Measurement items

- Measurement items for the research items were sourced from existing literature (Asamoah et al., 2020; Cao, 2018; Koçoğlu et al., 2011; Won Lee et al., 2007; Zhang and Wu et al., 2006)
- The measures were refined by three professors specializing in business intelligence and practitioner business intelligence experts.
- The measures were also subjected to pilot testing for further refinement.





Methodology: Data collection

- Data for the study was obtained from a survey of firms involved in retail trade in Ghana.
- IOS has seen increasing adoption in the retail operations in Ghana, particularly for fast-moving consumer goods (Asamoah et al., 2020).
- Five hundred firms directly involved in the wholesale and retail of fast-moving consumer goods were randomly selected from a database and targeted for data collection.
- Questionnaires were delivered to these organizations, together with a cover letter explaining the purpose of the study.
- In all, 161 usable responses were received.





Measurement model results

- Measurement model results were assessed by following the guidelines of Hair et al. (2019).
- Indicator loadings were found to be more than 0.708 as required, indicating good item reliability.
- Composite reliability values were greater than 0.7, indicating internal consistency reliability of the research constructs.
- The average variance extracted (AVE) values were larger than 0.5, indicating acceptable convergent validity of the model.





Psychometric properties of research constructs

Constructs	Composite Reliability	AVE
Coordination Capabilities (CORD)	0.916	0.685
Efficiency (EFF)	0.930	0.767
Flexibility (FLEX)	0.925	0.712
Information Exchange Capabilities (INFX)	0.930	0.768
Integration (INTG)	0.931	0.773
IOS-enabled business intelligence (INTL)	0.914	0.726
Reliability (REL)	0.927	0.718
Supply Chain responsiveness (RESP)	0.905	0.703





Measurement model results

- In establishing discriminant validity, we used the Fornell-Larcker criterion and the HTMT (Hair et al., 2019).

Table 3. Fornell-Larcker test results

	CORD	EFF	FLEX	INFX	INTG	INTL	REL	RESP
CORD	0.828							
EFF	0.672	0.876						
FLEX	0.614	0.708	0.844					
INFX	0.781	0.664	0.656	0.876				
INTG	0.638	0.530	0.492	0.615	0.879			
INTL	0.634	0.636	0.645	0.672	0.594	0.852		
REL	0.668	0.702	0.701	0.707	0.627	0.664	0.848	
RESP	0.717	0.663	0.697	0.765	0.712	0.766	0.726	0.839

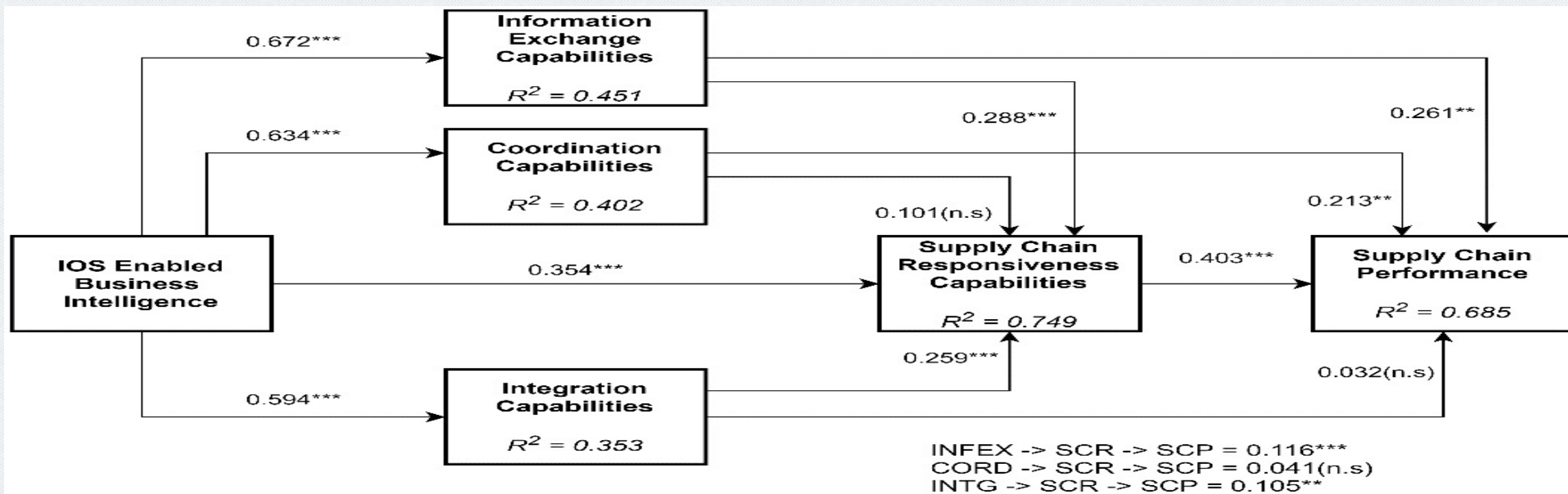
Table 4. HTMT results

	CORD	EFF	FLEX	INFX	INTG	INTL	REL	RESP
CORD								
EFF	0.748							
FLEX	0.678	0.786						
INFX	0.867	0.738	0.725					
INTG	0.709	0.587	0.545	0.682				
INTL	0.717	0.716	0.725	0.757	0.669			
REL	0.741	0.782	0.776	0.786	0.696	0.747		
RESP	0.816	0.753	0.791	0.868	0.810	0.883	0.825	



Measurement model results

- The predictive relevance of the model was also established since Q2 values ranged from 0.260 to 0.596, which are significantly larger than zero (Hair et al., 2019).





Discussion of Findings

- The study found that IOS-enabled business intelligence first allowed organizations to obtain information exchange capabilities, coordination capabilities and integration capabilities.
- We found that IOS-enabled business intelligence enhanced the supply chain responsiveness capabilities of firms.
- Additionally, the study revealed that information exchange capabilities and integration capabilities can be leveraged to achieve higher supply chain responsiveness.





Discussion of Findings

- It was observed that information exchange capabilities, coordination capabilities and supply chain responsiveness capabilities all resulted in higher supply chain performance.
- The study found a partial mediation role of supply chain responsiveness in explaining the effect of information exchange capabilities on supply chain performance.
- Also, the effect of integration capabilities on supply chain performance is fully mediated through supply chain responsiveness.





Implications

- The study provides a detailed understanding of how IOS-enabled business intelligence enhances supply chain performance, by bringing to light the role of supply chain management capabilities in enhancing supply chain performance.
- The study also foments an understanding in the interrelationships between supply chain capabilities that can guide future researchers who are studying supply chain capabilities.
- The study also adds up to the nascent studies on business intelligence within the African context.
- The study also provides insights for owners and managers of firms by creating a clear understanding of how IOS-enabled business intelligence may enhance their supply chain performance.





Conclusion

- The study examined into detail the mechanisms through which IOS-enabled business intelligence enhances the supply chain performance of firms by proposing that supply chain capabilities play an important, individual and staggered role in explaining this relationship.
- The findings of the study largely support the assertions of the study, with IOS-enabled business intelligence enhancing all four identified supply chain management capabilities, and three of the capabilities having a significant effect on supply chain responsiveness and performance.





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Thank You