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Re-Imagining the Use of Data Standards for Retail Products: The Case of GS1 through a Service-Dominant Logic

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Abstract. Though technological advancements offer a host of emergent opportunities, they also introduce fresh challenges for organizations. To overcome these challenges, organizations need to be sensitive to the evolving business needs and growing expectations of the customers. In this research-in-progress paper, through the case of GS1, we demonstrate that even for a seemingly stable business, there is a need to continuously evaluate the influence of changes in the situating technological environment, which may lead to changes in the societal demands. GS1, a non-profit organization that develops and maintains global standards for business communication is redefining itself in the face of e-commerce impacted supply chains and evolving customer needs. We posit that organizations need to espouse a service dominant logic mindset, which can help them continually assess and redefine their business models to address the evolving ecological requirements. Our ongoing work aims to identify a set of lessons for firms to tackle this perpetual challenge.

Keywords: Data standards, omni channel, barcode, supply chain, data as a service, service dominant logic

1 Introduction

In the current times organizations are becoming increasingly dependent on information technology (IT). From a mere support function, IT has evolved into becoming the bedrock of organization's business strategies [1]. Whether it is the quest for exploring new strategic opportunities enabled by artificial intelligence and social media analytics, or enrichment of the ongoing business operations through efficient enterprise resource planning systems, the role of IT is now deeply intertwined with the core business. Given the rapid rate at which IT is advancing, and the close interdependence between the IT and business strategy, results in both opportunities and challenges for organizations —opportunities to tap into the capabilities of the technological advancements and challenges to keep pace with the rapidly evolving technological landscape that can sometimes tend to impact the underlying logic on which the organization is

premised. It will be theoretically and practically interesting to examine how agile organizations are able to continuously redefine their strategies in the face of a continuously changing technological environment.

The next big obstacle after the industrial revolution was the need to develop a supply chain that could effectively and efficiently handle the distribution of the large variety of products manufactured in the numerous factories. In the non-Internet era, the retail supply chain relied on intermediaries such as warehouses, wholesales, and the retailers who were the final touch points with the end customers. However, as the number of products increased there was a growing need to *standardize* the "identification" of the products to ensure their error free traceability throughout the supply chain [2]. This pressing supply chain need was precipitated in the US where the retail industry was searching for ways to speed-up the checkout process at the point-of-sales. After the establishment of the ad hoc committee for a uniform grocery product identification code in 1969, it was not until 1973 when the Universal Product Code (UPC) was selected as the first single standard for unique product identification. In 1974, a pack of Wrigley's chewing gum became the first ever product with a bar code to be scanned in a shop [3]. Because of the grassroots need to exchange product related data in the retail market around the globe, a non-profit organization called GS1 gradually emerged as the nodal agency that served as a platform for fulfilling the need of *providing standards for product data exchange* for a seamless flow of products across supply chain partners to the end customers. However, with the growth of technological capabilities for data exchange, communication and the Internet, the data related needs of the supply chain partners and customers also evolved. Instead of viewing product related barcode data merely for "identification" to ensure *physical traceability*, supply chain partners started looking for enhanced "description" of the products to establish *informational traceability* for recombing this product related information with other informational sources to create value for different customers (supply chain partners and end customers).

We examine this evolution in the needs of the supply chain customers through the lens of GS1, which is a non-profit organization that develops and maintains global standards for business communication. GS1 presents a unique study context for two reasons (1) maintaining standards, by definition appears to be a static concept with seemingly stable business logic, and (2) customers for such a business also appear to be relatively fixed. However, as aforementioned, we observe that both the *standards* and the *customers* of product supply chain standards have been evolving. GS1 has been endeavoring to meticulously address the changing demands in this evolutionary journey. Consequently, through the case of GS1 we examine the following research questions:

1. How can the technological advancements impact a seemingly stable business logic?

2. How can organizations premised on principles of stability instill agility in their organizations in response to the evolving business logic?

Grounding our study in service-dominant logic (SDL) literature and adopting a case study research approach we examine how the definition and need for data exchange evolved over time. And how because of this evolution, GS1, the organization providing the platform and standards for data exchange had to incorporate appropriate changes in its business model through innovative solutions such as CodeOnline by GS1 France. The case reiterates the importance of examining the seemingly product-centric business models through a service-centric lens. We observe that because of technological evolution, data standards, which are seemingly static attributes of products could be used for providing value added services. In addition, the study reiterates the importance of instilling agility into traditional product centric organizations that may be impacted by the enhanced informational connectivity and other technological advancements.

2 Theoretical Background and Study Context

Business models are premised on value creation for the key stakeholders. Traditional models of value creation are based on the goods-dominant (G-D) logic, in which a firm's output is the source of value creation. G-D logic is based on a push philosophy, viewing produced goods as the source of value for the consumer. The value produced is thus "value-in-exchange," where the product is the starting point for value creation and the product is expected to create value for the consumer when they are consumed. G-D logic thus views producers and consumers as separate entities with distinct roles in the value creation process. Producer playing the key role, conceptualized "as a series of activities performed by the firm" [4, p.146]. The consumer is only expected to benefit from the value created by the producer. Going by the described G-D logic, GS1 as the platform for the provision of data standards to the supply chain partners is supposed to provide the rules and a classification system (e.g. in the form of barcodes) that provides a language of communication across supply chain partners for seamless exchange of physical products. By definition, the application and usage of the formulated data standard rules are expected to be static over time and the primary use that could be imagined by the GS1 users is to have an error free "identification" of the physical products as they move from the producer to the end customer through the supply chain partners such as wholesalers and retailers.

Vargo and Lusch [4, 5] proposed an alternative view, a service-dominant (S-D) logic in which the roles of producers and consumers in the value creation process are intertwined rather than distinct. The focus is on the requirements of the service consumers (users) and the offerings of service producers (providers) that aim at creating "value-in-use." Value in the S-D logic is created jointly and reciprocally through mutual interactions, facilitating integration of resources among the producers and consumers [4]. This new pull-based S-D logic has a user-centric perspective in which the producer and the consumer together create value by designing processes that mutually leverage available resources [6, 7, 8]. However, service provision entails greater use of intangible resources such as knowledge and skills for value creation, in addition to tangible re-

sources such as technology or standards. Thus, in contrast to G-D logic, S-D logic emphasizes an appropriate configuration of resources—intangibles along with tangibles—to create value for consumers. In the case of GS1, the data standards are the rules that define the basis of data exchange across the supply chain partners. The implementation of these rules of standardization was left to the supply chain partners specifically the brand owners who were interested in a smooth supply chain journey for their products. However, with the growth of Internet and e-commerce there were two challenges for GS1. First, to make the data standards *accessible* to all the possibly interested players in the product supply chain, e.g. the small and medium enterprises (SMEs) who could now benefit from the Internet enabled supply chains. Such a shift entailed GS1 adopting a service-centric mindset to provide not only the 'data standards' but also the necessary 'toolkit' to implement these data standards. Second, because of the ease of access to information, the end customers want customized product related solutions which could be orchestrated by combining specific product related information with other contextual information e.g. to have a lunch menu based on the nutritional properties of the packaged food products. Such value-added solutions require GS1 to capture and provide the appropriate product related "information" to the ecosystem partners to enable them design customer-centric solutions.

The need to provide value-added solutions to different customer segments signifies the growing importance of operant resources in the current supply chain context. *Operand resources* represent tangible assets, for example, in the case of GS1 these were the rules for data standards linked with the Global Trade Item Numbers (GTIN) and bar codes for identifying products in the supply chains [9]. However, now GS1 sees a need to shift to develop *operant resources*, which are generally invisible and intangible and shaped out of knowledge and recombined capacities, for example, the GTIN implementation tool kit or customized product related solutions. In our study, we examine this shift and also identify the practices that GS1 adopted to overcome the challenges for developing the operant resources.

3 Method

This research aims at identifying the specific actions that GS1 took to overcome the challenges imposed on it because of the growing importance of e-commerce and online supply chains. Specifically, we first identify the challenges faced by GS1 and then examine the key actions taken by GS1 to overcome the identified challenges. We adopt a systematic retrospective longitudinal case study research approach to examine how the definition and need for product data exchange evolved over time and how because of this evolution, GS1 had to incorporate appropriate changes in its business model through innovative solutions such as CodeOnline for providing access to an enhanced set of supply chain partners, or initiating efforts to capture product related data which could perhaps be used by ecosystem partners for providing value added customer-centric solutions.

Consistent with the case study research approach, we will provide an overview of some of the streams of research that will contribute to our analysis, namely, service dominant logic in conjunction with literature on operand and operant resources [8, 10, 11].

Our study uses a mix of primary and secondary data to analyze the research questions. We have already conducted 5 interviews and have attended several presentations given by the ecosystem partners and management team at GS1. Some of the key respondents were interviewed multiple times to clarify the facts as they emerged during the data collection process. We have audio recorded and transcribed all the interviews conducted thus far, which provided us with about 100 pages of single-spaced transcripts. We also took detailed notes during all interviews. For secondary data, we went through the organizations' activity reports, websites, published articles, internal reports, and video clips. We are using a longitudinal process view to analyze the data, aimed at understanding the actions taken in response to the specific challenges encountered [12, 13, 14]. In the coming months, we intend to interview two other categories of GS1 stakeholders (1) supply chain partners who are using GS1 services directly, and (2) final consumers of products, who need new value-added services.

4 Preliminary Findings and Expected Implications

Technological advancements do offer new opportunities but may also be instrumental in inducing unprecedented challenges even for traditionally product-centric organizations. GS1, a global non-profit organization, established for determining and maintaining commonly agreed data standards for product identification, faced challenges with the growth of Internet in two ways.

First, the growth of Internet heralded the use of e-commerce which initially connected the big brands directly to the end-customers. However, with the passage of time marketplace platforms such as Amazon, replaced the direct sales from the brand owners. Such marketplaces are very similar to the physical supermarkets with some major differences: (1) the products sold through marketplaces do not need to be physically scanned at the checkout, which obviates the need for barcodes, (2) marketplaces could stock and sell white-labelled goods from unknown suppliers, which may not have a GS1 allocated GTIN, (3) marketplaces could stock and sell integrated/assembled products from different sub-suppliers where the individual sub-components may have different GTINs.

Second, because of the increased Internet enabled connectivity end consumers have increased access to information. The product needs for these informed consumers has become more sophisticated with the growing demand for customized products. Consumers would need more information about the products before purchasing them e.g. nutritional value related information for food products. In fact, if such product related information is readily available, entrepreneurs could work out customized solutions for specific consumers based on their tastes and preferences e.g. proposing a nutritious vegetarian meal to a diabetic consumer.

From the two aforementioned challenges, it is clear that GS1 product data standards, which were till now required primarily for an error free product identification and used mainly by big brands, needs to be reimagined in two ways (a) the GTIN standards need to made *accessible* to all possible users of e-commerce supply chain such as owners of SMEs and white-labelled product manufactures, and (2) GS1 needs to provide more *product related information* so that customized value added solutions can be proposed to different consumer segments by GS1 or its ecosystem partners.

Hence, there is a definite shift in the use of data by GS1 from a mere "identification" of products to getting detailed "information" about the products, which can be used to create value-added solutions for the consumers. GS1 is currently focused on overcoming these challenges through various initiatives such as CodeOnline and involvement of ecosystem partners to offer customizable solutions to different customer segments. In our study, we are delving deeper into the different actions taken by GS1 in this transformational journey from "data as a product" to "data as a service". Our study hopes to unearth specific lessons for traditionally product-centric organizations contemplating a shift to the emerging service-centric milieu because of the enhanced technological connectivity and information access.

References

1. Huang, M. H., Rust, R. T. Technology-driven service strategy. Journal of the Academy of Marketing Science, 45(6), 906-924, (2017).
2. Teo, T. S. H., Ranganathan, C., Srivastava, S.C., and Loo, J. W. K. Fostering IT-enabled Business Innovation at YCH Group, MIS Quarterly Executive, 6(4): 211-223, (2007).
3. GS1 details - accessed on August 4, 2020 - https://en.wikipedia.org/wiki/GS1, (2020).
4. Vargo, S. L., and Lusch, R. F. Service-Dominant Logic: Continuing the Evolution, Journal of the Academy of Marketing Science (36:1), 1-10, (2008).
5. Vargo, S. L., and Lusch, R. F. Evolving to a New Dominant Logic for Marketing, Journal of Marketing (68), pp. 1-17, (2004).
6. Sheth, J., and Parvatiyar, A. 2000. Relationship Marketing in Consumer Markets: Antecedents and Consequences, in Handbook of Relationship Marketing, J. Sheth and A. Parvatiyar (eds.), Thousand Oaks, CA: Sage Publications, (2000).
7. Teo, T. S. H., Srivastava, S. C., and C.K., Ho. 2006. "The Trident Model for Customer-Centric Enterprise System at Comfort Transportation, Singapore," MIS Quarterly Executive (5:3), 109-124, (2006).
8. Srivastava, S.C., and Shainesh, G. 2015. Bridging the Service Divide through Digitally Enabled Service Innovations: Evidence from Indian Healthcare Service Providers, MIS Quarterly, 39(1): 245-267, (2015).
9. GS1 GTIN- accessed on August 4, 2020 - https://www.gs1.org/standards/id-keys/gtin, (2020)
10. Nambisan, S. Information technology and product/service innovation: A brief assessment and some suggestions for future research. Journal of the association for information systems, 14(4), 1, (2013).
11. Madhavaram, S., & Hunt, S. D. The service-dominant logic and a hierarchy of operant resources: developing masterful operant resources and implications for marketing strategy. Journal of the academy of marketing science, 36(1), 67-82, (2008).

12. Teo, T. S. H., Srivastava, S.C., Ranganathan, C. & Loo, J. W. K. A Framework for Stakeholder Oriented Mindfulness: Case of RFID Implementation at YCH Group, Singapore, European Journal of Information Systems, 20: 201-220, (2011).
13. Chakraborty, S., Sarker, S., Sarker, S.: An Exploration into the Process Requirements Elicitation: A Grounded Approach. Journal of the Association for Information Systems 11(4), 212-249 (2010). https://doi.org/10.17705/1jais.00225
14. Lyytinen, K., Newman, M.: Explaining Information System Change: A Punctuated Socio-Technical Change Model, European Journal of Information Systems, 17(6), 589-613 (2008). https://doi.org/10.1057/ejis.2008.50