Towards Consumer Preference-Aware Requirements

Eric-Oluf Svee, Constantinos Giannoulis, and Jelena Zdravkovic

Stockholm University, Department of Computer and Systems Sciences,
Forum 100, 16440 Kista, Sweden
{eric-sve,constantinos,jelenaz}@dsv.su.se

Abstract. From the business perspective, one of the core concerns within Business-IT alignment is coordinating strategic initiatives and plans with Information Systems (IS). However, while substantial work has been done on linking strategy to requirements for IS development, it has usually been focused on the core value exchanges offered by the business, overlooking other aspects influencing the implementation of strategy. One of these, *consumer preferences*, has been proven to influence the successful provisioning of the business's customer value proposition, and this study aims to establish a conceptual link between them and system requirements. The core contention is that reflecting consumer preferences through business strategy in system requirements allows for the development of systems aligned to consumer preferences, and therefore systems that better support a consumer orientation, where the reasoning behind a particular solution stems from them. The contribution of this paper is the proposal of a consumer preference meta-model along with an illustration of its relationship to a requirements' technique (i*) through the Strategy Maps business strategy formulation.

Keywords: consumer preference, strategy maps, balanced scorecards, i*.

1 Introduction

The term *value proposition* describes how a business will create differentiated, sustainable value for its customers [1]. They are generally expressed quantitatively, as an amount in goods, money, services or rights, considered as a suitable equivalent for something else: a fair price or return for an investment [2]. In counterpoise are qualitative measures, which detail how a good or a service is delivered to, or perceived by, the consumer. These include non-economic values [3], internal values [4], and consumer values [5], among others.

Kotler [6] considered consumer preferences as playing a key role in business; as the key motivator behind, and the primary driver within economic value exchanges, they induce the consumer to seek solutions to fulfill their needs. For the business to deliver on its value proposition by successfully providing those need-fulfilling goods or services which consumers desire in the method and manner which they prefer, it is necessary for it to create a supporting infrastructure, a key component of which often are information systems. Therefore, a model needs be developed capable of capturing consumer preferences, and then presenting these to the business at an appropriate

M. Bajec and J. Eder (Eds.): CAiSE 2012 Workshops, LNBIP 112, pp. 531–542, 2012.

level and in an understandable way, such as through requirements for developing such information systems.

Book selling, a highly dynamic and price-sensitive business, can illustrate the significant impact consumer preferences can have on the IT systems created to deliver the value proposition to customers. *Borders* was the largest book store in the United States, but they missed the shift of the book selling business from physical locations to e-sales, going so far as to completely outsource their online store to *Amazon*. Shopping online instead of in bookstores became appealing to consumers for reasons such as convenience, while the core value exchange remained money for books. However, a brick-and-mortar competitor *Barnes & Noble* did not overlook this shift in consumer preferences and extended its traditional business into the online world while preserving its book stores. The final outcome was that Borders recently went out of business [7].

Similarly, *Amazon* set up its entire business around this shift in consumer preferences, and soon dominated online book selling. For example, to support different consumer preferences surrounding convenience, the company developed entirely new capabilities to purchase and deliver e-books, something for which its infrastructure for processing and shipping physical goods would not have been designed. Again in this example, although the core value exchange remains money for books, the consumer preferences making this exchange appealing vary greatly, and this variability demonstrates how they directly influence the business's success or failure. Success depends on the business's capability to align its IT systems to efficiently marshal and align its resources to aid in effectively presenting, and delivering upon, its value proposition to consumers [8].

The goal of the paper is to relate consumer preferences to system requirements by using the model-driven approach for mapping consumer-related notions to business strategy, and further to the requirements. The proposal is based on three previous studies; first, where it was argued and illustrated how consumer preferences influence business strategy, with the latter being a natural container for capturing those preferences [9]; the second, where a model-level mapping from business strategy to system requirements using the i* technique was presented [10]; and the third, where the enterprise architecture standard ISO 42010 was made consumer-values aware [11].

Section 2 provides a background to research on consumer preferences and briefly introduces business strategy through Strategy Maps and Balanced Scorecards (SMBSC) [1]. Section 3 defines a meta-model for consumer preferences, which in Section 4 is mapped to the meta-model for SMBSC. In Section 5, the impact of the consumer-aware SMBSC on system requirements is demonstrated via i*, based on a business transaction from the book selling business, as well as on the mapping framework proposed in [10]. Section 6 presents conclusions and direction for further work.

2 Background

This section introduces the concept *value*, frameworks and methods for working with it, as well as SMBSC, an established conceptualized business strategy formulation.

2.1 Frameworks for Understanding Consumer Preferences

To clarify the concept of value, conceptual frameworks for its description and discussion, as well as means to measure it, are utilized within this research. There are a number of possibilities to choose from, coming from various fields such as psychology and organizational theory with McLelland's Three Needs Theory [12], and retailing with Parasuraman's ServQual [13], among others. For illustrative purposes, this report relies on three: Maslow's Hierarchy of Needs [14], Schwartz's Value Theory [15], and Holbrook's Typology of Consumer Values [5]. These were selected due to their wide acceptance, application across a variety of industries, and robust conceptual frameworks.

A term that captured both the intentional and evaluative aspects of what drives the value exchange process was sought, with *consumer preference* selected. This was chosen over the more commonly used *customer* to highlight and then reinforce the conceptual break that this research attempts to make; by adopting a term that is not explicitly bound by economic transaction, the focus shifts to the comparative act of consumption, rather than remaining on the level of simple resource exchange.

The choice of consumer preference is grounded in the work of Powell-Mantel et. al., who break down consumer preference into two types: attribute-based, involving comparing brands based on specific attributes, and attitude-based, involving overall evaluations [16]. The term will be used in this work as a rubric for the three primary drivers that cause consumers to seek out goods and services: *Consumer Need*, a basic human need that must be satisfied (derived from psychology via Maslow); *Consumer Motivation*, a belief for what is important in life (coming from psychology via Schwartz); and *Consumer Value*, a judgment based on a comparative, preferential experience (coming from marketing via Holbrook).

Consumer Needs.
Human motivation was explored by Maslow [14] in which he first proposed his *Hierarchy of Needs*. In its final form offered nearly thirty years later, there are seven categories. Beginning with those of a basic necessity then moving to those that are needed for a more fully realized life, these are: *Physiological* (breathing, eating, excreting), *Safety* (security of body, employment, resources, health, property), *Love* (friendship, family), *Esteem* (self-esteem, confidence, achievement), *Cognitive* (knowledge, meaning), *Aesthetic* (appreciation and search for beauty, balance, and form) and *Self-actualization* (realizing personal potential, self-fulfillment).

The *Maslowian Assessment Survey* (MAS), a 195-item, Likert-type instrument offered by Williams and Page [17], is designed to measure three levels of Maslow's Hierarchy in adult populations: safety and security, belongingness and love, and esteem. This relates to Powell-Mantel's attitude-based consumer preference.

Consumer Motivation.
Another type of consumer preference is found in the motivational constructs of Schwartz's *Value Theory* (SVT) [15]. It adopts the definition of value from Rokeach, summarized as a belief that a specific mode of conduct or end-state is personally or socially preferable to its opposite [18]. This relates to Powell-Mantel's attitude-based consumer preference. According to this, values serve as criteria for judgments, preferences, choices, and decisions as they support the person's knowledge, beliefs,

and attitudes. SVT emphasizes the profound nature of values, but at the same time can offer a new consumer research approach by concretely combining these value structures with an analysis of human motivation.

Schwartz claims that items found in earlier value theories, in value questionnaires from different cultures, as well as religious and philosophical discussions of values, can be classified into one of ten motivationally distinct basic values [15]: *Power*, *Universalism*, *Achievement*, *Benevolence*, *Hedonism*, *Tradition*, *Stimulation*, *Conformity*, *Self-direction*, and *Security.*

Schwartz's *Value Survey* (SVS) was developed to measure the basic values laid out in SVT. SVS focuses on a universally applicable method for capturing and describing values across cultures and has been applied in numerous places [15], among which business as well for business strategy development support [19]. The Value Survey operationalizes all ten values with a set of 56 items, and the answers from the questionnaire can be converted into a set of numerical results that can be used directly, or visualized via a value structure.

Consumer Value.

Holbrook's *Typology of Consumer Values* [5] refines the value concept, focusing on those held by individuals during a value exchange, referring to them as consumer values and classifying them into a Typology of Consumer Values.

A consumer value is "an interactive, relativistic preference experience" [5]; interactive entails an interaction between some subject and an object, relativistic refers to consumer values being comparative, preferential refers to consumer values embodying the outcome of an evaluative judgment, and experience refers to consumer values not residing in the product/service acquired but in the consumption experience. Holbrook's definition allows for a rather expansive view of value, because all products provide services in their capacity to create need- or want- satisfying experiences. This related to Powell-Mantel's attribute-based consumer preference.

Three consumer value dimensions are the basis for his typology [5]: *Extrinsic/Intrinsic*, *Self-oriented/Other-oriented*, and *Active/Reactive*. Based on these eight archetypes that represent distinct types of value in the consumption experience—*Efficiency*, *Excellence*, *Status*, *Esteem*, *Play*, *Aesthetics*, *Ethics*, and *Spirituality*—are identified.

In the business-IT alignment discipline, value is most commonly used in an economic sense, to mean an object that can be offered by one actor to another [20] often where the worth or desirability of something is expressed as an amount of money [21]. A value object (also called a resource) is considered as something of economic value for at least one actor, e.g., a car, a book, Internet access or a stream of music [3]. Henkel et.al. state that values can be of more psychological and social natures, such as beauty, pleasure, health state, honor or a feeling of safety [22]. According to Gordijn [23], a user experience is also recognized as having a value. To distinguish between these different kinds of values, Ilayperuma and Zdravkovic identified two categories of values—economic and internal [4] — where internal value could be a certain property attached to an actor, such as their beauty or health, or it could be a property of some enabling service, such as speedy delivery. In contrast to the present proposal, none of these terms from Business-IT alignment functions sufficiently to capture and classify explicitly what constitute the focus within the present work.

2.2 Strategy Maps and Balanced Scorecards (SMBSC)

A strategy map is a business strategy formulation serving as a mediator between the mission, core values, and the vision of a business to the work performed. Kaplan and Norton proposed a template for strategy maps representing how an organization can create value. Starting from a mission statement and core values, a strategic vision is defined, which projects the organization's overall goal. A set of goals is defined and initially grouped within the financial and customer perspectives, along with goals for all types of capital (both human and economic) [1]. Goals are extended to a set of targets using measures to evaluate their achievement, and thereafter, initiatives are identified to achieve the targets, the balanced scorecard. This extension of the strategy map is the balanced scorecard which is essential for monitoring and assessing the cause-effect links between strategic goals across an organization.

The figure below presents a conceptualization of SMBSC [10] that supports mappings of consumer preferences to four generic types of customer value proposition: *Best Total Cost*, *Product Leader*, *Complete Customer*, and *System Lock-In* [1]. These four generic types of customer value proposition proposed by Kaplan & Norton frame the set of generic goals set in the Customer Perspective

3 Consumer Preference Meta-model (CPMM)

A meta-model for expressing consumer preferences—the Consumer-Preference-aware Meta-model (CPMM)—is now proposed. After its explication, SMBSC—a meta-model capable of a business strategy is then related to it.

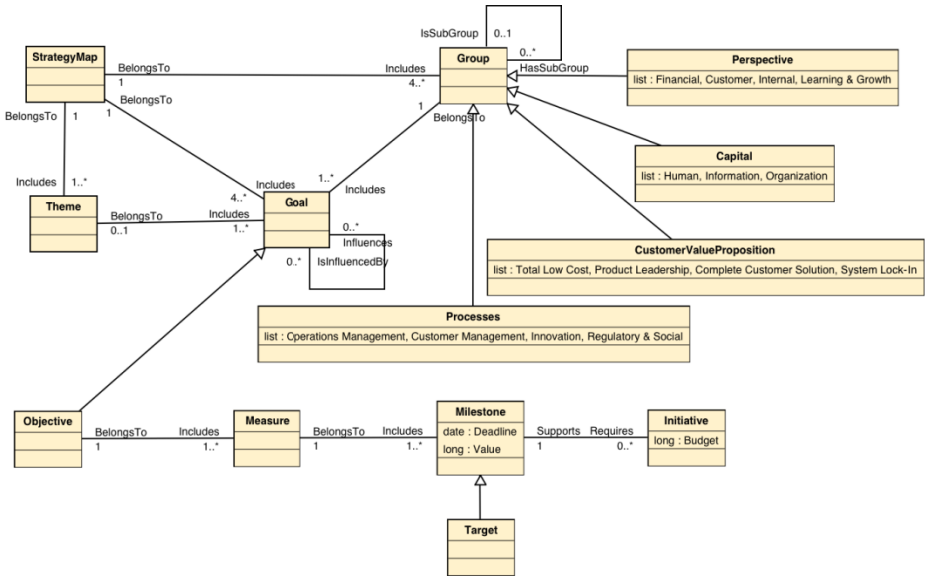

Fig. 1. SMBSC Meta-model [10]

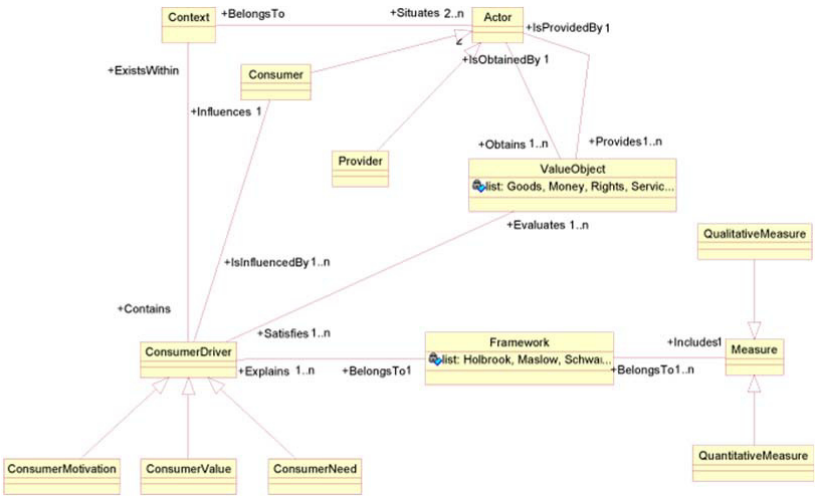

Fig. 2. Consumer Preference Meta-Model (CPMM)

Class Descriptions.

CPMM.Context represents the premises within which a transaction takes place (i.e. it may refer to location, either physical or virtual). For the bookselling scenario, an example of context would be an online store.

CPMM.Actor contains both *CPMM.Consumer* and *CPMM.Provider*, economically independent entities that are the primary participants within the exchange of goods, money, rights, or services. In the example, *CPMM.Consumer* is the consumer, the *CPMM.Provider* is the bookseller.

CPMM.ValueObject is the focus of the process wherein the consumer evaluates whether the value object satisfies the motivation, value or need driving their desire to participate in the exchange process. In the bookseller example, this would be a book.

CPMM.Framework provides a theoretical means to understand and explain consumer drivers that need to be satisfied through the consumption experience. In the bookseller example, a marketing survey reports that customers want to be actively engaged in an enjoyable shopping experience. An example of this is Maslow's Hierarchy.

CPMM.Measure quantifies and conceptualizes values. Its sub-classes– *CPMM.QualitativeMeasure* and *CPMM.QuantitativeMeasure*– are means contained within each of the various frameworks that can be used for conceptualization and quantification. An example of *CPMM.QualitativeMeasure* would be the core dimensions of Holbrook's Typology when used for classifying and explaining a consumer preference. *CPMM.QuantitativeMeasure* is exemplified via Schwartz's Value Survey [15] where the results of the questionaire can provide a value profile.

CPMM.ConsumerDriver is the preferences that drive a consumer's evaluative process as they seek fulfillment. Self-actualization is a consumer driver that could lead someone to purchase a self-help book from a book seller to aid their personal growth.

CPMM.Maslow:Framework contains Maslow's Hierarchy (Physiological, Safety, Love, Esteem, Cognitive, Aesthetic, Self-actualization).

CPMM.Holbrook:Framework, contains Holbrook's Typology (Efficiency, Excellence, Status, Esteem, Play, Aesthetics, Ethics, Spirituality).

CPMM.Schwartz:Framework, contains Schwartz's Values (Power, Universalism, Achievement, Benevolence, Hedonism, Tradition, Stimulation, Conformity, Self-direction, Security, and Spirituality).

Constraints.
Apart from the cardinality constraints included in the meta-model, a set of constraints is also introduced to capture the permissible instantiations of concepts found in the frameworks.

At least one instance of both *CPMM.Consumer* and *CPMM.Provider* must belong to the same *CPMM.Context.*

Moreover, an instance of *CPMM.ValueObject* provided by an instance of *CPMM.Provider* which is an instance of *CPMM.Actor* which belongs to an instance of *CPMM.Context* is the same instance of *CPMM.ValueObject* obtained by an instance of *CPMM.Consumer* which is an instance of *CPMM.Actor* that belongs to the same instance of *CPMM.Context.*

The frameworks of Maslow and Schwartz possess quantitative measures, whereas only Holbrook's includes qualitative measures. *CPMM.QuantitativeMeasure* is a *CPMM.Measure* that *BelongsTo CPMM.Framework:Schwartz* or *CPMM.Framework:Maslow. CPMM.QualitativeMeasure* is a *CPMM.Measure* that *BelongsTo CPMM.Framework:Holbrook*.

Furthermore, each sub-class of *CPMM.ConsumerDriver* is related to a particular framework. *CPMM.ConsumerDriver.ConsumerNeed* can only *BelongTo* an instance of *CPMM.Framework.Maslow*, *CPMM.ConsumerDriver.ConsumerMotivation* class can only *BelongTo* an instance of *CPMM.Framework.Schwartz*, and similarly an instance of *CPMM.ConsumerDriver.ConsumerValue* can only *BelongTo* an instance of *CPMM.Framework.Holbrook*.

3.1 Relating CPMM to SMBSC Meta-model

SMBSC includes four generic types of customer value proposition: *Best Total Cost*, *Product Leader*, *Complete Customer*, and *System Lock-In* [1], which consequently frames a set of generic goals under each customer value proposition type. Based on this grouping of goals and their mapping to consumer drivers as captured by CPMM, the Customer Perspective of SMBSC reflects customer preferences in a traceable manner. In Table 1, consumer drivers captured by *CPMM.ConsumerDriver* are related to the generic strategic goals of the four types of customer value proposition of SMBSC captured by *SMBSC.CustomerValueProposition*.

Generic strategic goals for Best Total Cost aim at consistent, timely and low-cost offerings [1], where goals on (i) lowest-cost suppliers, aiming at attractive prices, (ii) consistently high quality, aiming at excellent and consistent quality offering, (iii) speedy purchase, aiming at short lead times and ease of purchase, and (iv) appropriate selection, aiming at good selection offering. Following the mappings of Table 1

where generic strategic goals are mapped to consumer preferences, strategic goals can be linked to particular consumer drivers (need, motivation, value).

Considering the bookselling scenario, where a bookseller adopts the *Best Total Cost* customer value proposition, the strategic goal "*Select Lowest-Cost Supplier"* is an instance of *SMBSC.Goal*, which *BelongsTo SMBSC.CustomerValue Proposition:BestTotalCost*, which *IsSubGroupOf SMBSC.Perspective:Customer* which is a *SMBSC.Group*. Such a goal can be measured, thus is an instance of *SMBSC.Objective* and *Includes* a *SMBSC.Measure* captured by the cost offerings provided from suppliers, expressed in a monetary unit. According to Table 1, the *SMBSC.Goal* "*Select Lowest-Cost Supplier"* of the bookseller can be linked to following consumer drivers: *Safety*, *Security*, *Efficiency*, and *Excellence*.

Safety expresses security in resources and property. The bookseller must ensure that selecting the price being offered is the lowest among suppliers to constitute a safe investment. Ensuring the lowest price offered among suppliers is an instance of *CPMM.ConsumerNeed:Safety* which is a *CPMM.ConsumerDriver* and *BelongsTo CPMM.Framework:Maslow* that provides both the quantitative measure of a value, but also the conceptual framework to explain it.

Security expresses stability in relationships. The bookseller must ensure that selecting the supplier offering the lowest price constitutes a secure investment. Ensuring a secure investment among low-cost suppliers is an instance of *CPMM.ConsumerMotivation:Security* which is *a CPMM.ConsumerDriver* and *BelongsTo CPMM.Framework:Schwartz* that provides both the quantitative measure of a value, but also the conceptual framework to explain it.

Efficiency is often expressed as a ratio of inputs versus outputs. For the bookseller efficiency could be referring to a supplier that allows minimal shipments to customers. Choosing a low-cost supplier offering efficient shipments is an instance of *CPMM.ConsumerValue:Efficiency* which is a *CPMM.ConsumerDriver* and *BelongsTo CPMM.Framework:Holbrook* that provides both the qualitative means to both express and to measure it.

Excellence expresses an appreciation of something's potential ability to serve as a means to some end. The bookseller must ensure that when selecting the supplier offering the lowest price, reputation is considered. Ensuring supplier's reputation is an instance of *CPMM.ConsumerValue:Excellence* which is a *CPMM.ConsumerDriver* and *BelongsTo CPMM.Framework:Holbrook* that provides both the qualitative means to both express and to measure it.

Each instance of the aforementioned consumer drivers evaluates the same instance of *CPMM.ValueObject:Goods* which is book supplies, where each supplier is an instance of *CPMM.Provider* which is a *CPMM.Actor* and the bookseller is an instance of *CPMM.Consumer* that *IsInfluencedBy* all aforementioned *CPMM.ConsumerDriver*.

Additionally, *SMBSC.Measure* which captures the means to evaluate the achievement of a *SMBSC.Objective* which is a measureable goal, thus captures a quantifiable measure can be associated with *CPMM.Framework.QuantiativeMeasure* which also captures quantifiable measures.

Similar instantiations can be derived for each generic strategic goal of the four types of customer value propositions of SMBSC based on the mappings of Table 1.

Table 1. Strategic Goals Related to Consumer Drivers

Goals from Strategy Map Templates	Consumer Drivers		
	Consumer Need	**Consumer Motivation**	**Consumer Value**
Best Total Cost			
Lowest Cost Supplier	Safety	Security	Efficiency Excellence
Consistently High Quality	Aesthetic	Conformity, Security, Power, Hedonism, Tradition	Efficiency, Excellence
Speedy Purchase	Safety	Self-direction	Efficiency, Excellence
Appropriate Selection	Safety	Self-direction, Spirituality	Efficiency, Excellence
Product Leader			
High Performance Products	Esteem, Aesthetic	Conformity, Security, Power, Stimulation, Hedonism	Efficiency, Excellence, Play, Aesthetics
First to Market	Safety, Love, Esteem, Aesthetic, Self-actualization	Self-direction, Stimulation	Efficiency, Excellence
New Customer Segments	Safety, Love, Esteem, Aesthetic, Self-actualization	Stimulation, Tradition, Universalism, Spirituality	Efficiency, Excellence, Play, Aesthetics, Esteem Status, Ethics, Spirituality
Complete Customer Solutions			
Quality of Solutions Provided	Safety	Conformity, Security, Hedonism, Tradition, Power, Spirituality	Efficiency, Excellence, Play Aesthetics Esteem
Number of Products/ Services per Customer	Safety, Esteem	Self-direction	Efficiency, Excellence
Customer Retention	Safety, Love, Esteem, Aesthetic, Self-actualization	Conformity, Security, Tradition, Universalism, Spirituality	Efficiency, Excellence, Play, Aesthetics, Esteem, Status, Ethics, Spirituality
Lifetime Customer Profitability	Safety, Love, Esteem, Aesthetic, Self-actualization	Tradition, Spirituality	Efficiency, Excellence, Play, Aesthetics, Esteem
System Lock-in			
Broad Selection/ Convenient Access	Safety, Esteem	Self-direction, Security	Efficiency, Excellence
Widely Used Standard	Safety, Esteem	Conformity, Security, Achievement, Tradition, Universalism	Efficiency, Excellence
Stable Platform Innovation	Safety	Achievement, Tradition, Universalism	Efficiency, Excellence
Large Customer Base	Safety	Achievement, Tradition, Universalism	Efficiency, Excellence
Easy-to-Use Platform and Standard	Safety	Self-direction, Tradition, Universalism	Efficiency, Excellence

The linkages identified between generic strategic goals (SMBSC) and consumer preferences (CPMM) allow enriching the former with a set of goals focused on capturing consumer preferences, thus increasing the level of detail of SMBSC. This means that the generic strategic goal "*Select Lowest-Cost Supplier*" is influenced by

goals on safety, security, efficiency and excellence aiming at satisfying the need, the motivation and value of a consumer.

For the bookselling scenario, based on the linkages identified earlier, the *SMBSC.Goal "Select Lowest-Cost Supplier" BelongsTo SMBSC.CustomerValueProposition:BestTotalCost* which *IsSubGroupOf SMBSC.Perspective:Customer:*

- *IsInfluencedBy SMBSC.Goal "Ensure lowest price offered"* which *BelongsTo SMBSC.CustomerValueProposition:BestTotalCost* which *IsSubGroupOf SMBSC.Perspective:Customer,*
- *IsInfluencedBy SMBSC.Goal "Ensure secure investment among suppliers"* which *BelongsTo SMBSC.CustomerValueProposition:BestTotalCost* which *IsSubGroupOf SMBSC.Perspective:Customer,*
- *IsInfluencedBy SMBSC.Goal "Choose supplier offering efficient shipments"* which *BelongsTo SMBSC.CustomerValueProposition:BestTotalCost* which *IsSubGroupOf SMBSC.Perspective:Customer,*
- *IsInfluencedBy SMBSC.Goal "Ensure supplier's reputation"* which *BelongsTo SMBSC.CustomerValueProposition:BestTotalCost* which *IsSubGroupOf SMBSC.Perspective:Customer.*

4 Consumer Preference: From Strategy to Requirements Using i*

Relating consumer preference with SMBSC by introducing strategic goals that express consumer drivers allows the use of the model-level mapping of SMBSC concepts to system requirements using i* [10]. i* is a goal modeling technique used in requirements engineering operationalizing goals through concrete actions and design decisions [24]. Based on the mappings in [10], the SMBSC strategic goals introduced via consumer drivers of CPMM can be represented as goals or soft-goals in i* allowing the derivation of system requirements that support their operationalization.

Since consumer preference is strongly related to customer value proposition, mappings to i* are relevant only to the customer perspective of SMBSC. Additionally, strategic goals originating from consumer needs or consumer motivations are represented as goals in i* because the frameworks they belong to use quantitative measures (see CPMM). Strategic goals originating from consumer values are represented as soft-goals in i* because the framework they belong to uses qualitative measures (see CPMM).

For the bookselling scenario, Figure 3, presents a partial i* SRM of the SMBSC strategic goal "*Select Lowest-Cost Supplier*" including consumer preference. The goals derived are based on linkages to consumer drivers, e.g. "Lowest Priced Offer to be Ensured" and are accompanied with tasks pointing towards actions for their achievement through *Means-ends* links. Thus, pointing to their operationalization through concrete actions and design decisions for a system that should compare all prices offered, evaluate suppliers' trustworthiness, shipment policies and reputation.

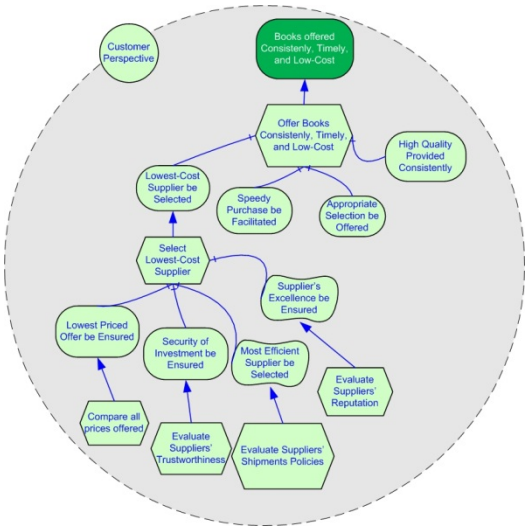

Fig. 3. A bookseller's Strategic Goals on Consumer Preference illustrated in i*

5 Conclusions and Future Work

In this study a Consumer Preference Meta-Model (CPMM) has been presented to establish linkages between consumer preferences and generic strategic goals formulated by SMBSC. Their purpose is to reflect consumer preferences through business strategy to system requirements allowing for the development of systems that better support a business's customer value proposition. Establishing such linkages provides traceability between consumer preferences and system requirements through business strategy. This allows consumer preferences to appear as stakeholder requirements (via SMBSC mappings to i* in a traceable manner through strategy.

The goal of the paper was to establish linkages between consumer preferences and business strategy to illustrate how consumer preferences can be reflected in requirements. The former has been achieved by modeling consumer preferences in CPMM and arguing for the relationships of consumer drivers to strategic goals of SMBSC based on four generic customer value propositions. The latter has been illustrated by using a model-level approach for mapping SMBSC concepts to i* constructs constituting transparent/clear what consumer preference strategic goals in the consumer perspective in SMBSC are directed towards. Throughout the paper, a bookselling scenario has been used to explain and illustrate the applicability of the proposal.

Future directions of the work are focused on applying a complete case to evaluate the presented meta-model, as well as the traceability of consumer preferences to requirements derived through SMBSC.

References

1. Kaplan, R., Norton, D.: Strategy Maps: Converting Intangible Assets into Tangible Outcomes. Harvard Business Review Press (2004)
2. McCarthy, W.E.: The REA Accounting Model: A Generalized Framework for Accounting Systems in a Shared Data Environment. The Accounting Review (1982)

3. Afuah, A., Tucci, C.: Internet Business Models & Strategies. McGraw Hill, Boston (2003)
4. Ilayperuma, T., Zdravkovic, J.: Exploring Business Value Models from the Inter-Organizational Collaboration Perspective. In: ACM Symposium on Applied Computing (SAC) Sierre, Switzerland, pp. 99–105 (2010)
5. Holbrook, M.B.: Consumer Value: A Framework for Analysis and Research. Routledge, London (1998)
6. Kotler, P.J.: Marketing Management, 7th edn. Prentice-Hall, Englewood Cliffs (1991)
7. The New York Times (January 25, 2012), http://nyti.ms/oThCIm
8. Inside Retailing (April 9, 2012), http://www.insideretailing.com.au/IR/IRnews/How-Amazon-is-redefining-the-book-market-4630.aspx
9. Svee, E.-O., Giannoulis, C., Zdravkovic, J.: Modeling Business Strategy: A Consumer Value Perspective. In: Johannesson, P., Krogstie, J., Opdahl, A.L. (eds.) PoEM 2011. LNBIP, vol. 92, pp. 67–81. Springer, Heidelberg (2011)
10. Giannoulis, C., Zdravkovic, J.: Modeling Strategy Maps and Balanced Scorecards using i*. In: 5th Int'l i* Workshop (iStar 2011), vol. 766, pp. 90–95. CEUR-WS, Aachen (2011)
11. Svee, E.-O., Zdravkovic, J., Giannoulis, C.: Consumer value-aware enterprise architecture. In: Venkatraman, B.I.N. (ed.) ICSOB 2012. LNBIP, vol. 114, pp. 55–69. Springer, Heidelberg (2012)
12. McClelland, D.C.: Human Motivation. Cambridge University Press (1988)
13. Parasuraman, A., Zeithaml, V., Berry, L.: SERVQUAL: A Multiple-Item Scale for Measuring Consumer Perception of Service Quality. J. Retailing 64, 12–40 (1988)
14. Maslow, A.H.: A Theory of Human Motivation. Psychological Rev. 50(4), 370–396 (1943)
15. Schwartz, S.H.: Universals in the Content and Structure of Values: Theoretical Advances and Empirical Tests in 20 Countries. In: Zanna, M. (ed.) Advances in Experimental Social Psychology, San Diego, vol. 25 (1992)
16. Powell-Mantel, S., Kardes, F.J.: The Role of Direction of Comparison, Attribute-Based Processing, and Attitude-Based Processing in Consumer Preference. J. Consumer Research 25, 335–352 (1999)
17. Williams, D., Page, M.M.: A multi-dimensional measure of Maslow's hierarchy of needs. Journal of Research in Personality 23, 192–213 (1989)
18. Rokeach, M.: The Nature of Human Values. The Free Press, New York (1973)
19. Epstein, M., Manzoni, J.F.: Implementing corporate strategy—from Tableaux de Bord to Balanced Scorecards. European Management J. 16(2), 190–203 (1998)
20. Weigand, H., Johannesson, P., Andersson, B., Bergholtz, M., Edirisuriya, A., Ilayperuma, T.: On the Notion of Value Object. In: Martinez, F.H., Pohl, K. (eds.) CAiSE 2006. LNCS, vol. 4001, pp. 321–335. Springer, Heidelberg (2006)
21. Wieringa, R., Gordijn, J., van Eck, P.: Value-Based Business-IT Alignment in Networked Constellations of Enterprises. In: 1st Int'l Workshop on Requirements Engineering for Business Need and IT Alignment (REBNITA 2005), Paris, France (2005)
22. Henkel, M., Johannesson, P., Perjons, E., Zdravkovic, J.: Value and Goal Driven Design of E-Services. In: IEEE Int'l Conf. on E-Business Engineering (ICEBE 2007). IEEE Computer Society Press, Hong Kong (2007)
23. Gordijn, J., Akkermans, H., van Vliet, H.: Business Modelling is Not Process Modelling. In: Mayr, H.C., Liddle, S.W., Thalheim, B. (eds.) ER Workshops 2000. LNCS, vol. 1921, pp. 40–51. Springer, Heidelberg (2000)
24. Yu, E.: Modeling Strategic Relationships for Process Reengineering. PhD. thesis. Department of Computer Science, University of Toronto, Canada (1995)