ALDERSONIAN SORTING: AN 'OLD' CONCEPT FOR A 'NEW' REALITY

Lars-Erik Gadde and Kajsa Hulthén

Department of Industrial Marketing
Chalmers University of Technology
SE-412 96 Gothenburg, Sweden
Tel: +46(31)-772 10 00, E-mail: largad/kajhul@mot.chalmers.se

Introduction

> *'Usually, upon hearing a mention of Wroe Alderson, the student of marketing feels vague stirrings in his mind of an almost mysterious notion known as sorting…'* (Hostiuck & Kurtz 1973, p. 141)

This paper deals with this 'mysterious' notion of sorting, which we consider to be one of the most important and useful concepts in marketing. According to Alderson (1957) the whole marketing process is at bottom a process of sorting. The sorting concept has been used mainly to explain the creation of assortments in distribution channels in terms of 'sorting out, allocation, assorting, and accumulation'. However, this is a partial interpretation only, because Aldersonian sorting is, in fact, a much richer concept. The aim of this paper is to illustrate the relevance of the sorting concept. We use sorting as a basis for the development of an analytical framework that can be used to better understand some of the recent developments in distribution channels for industrial goods. The framework is illustrated by examples from the distribution network in the PC industry. Finally, we provide some theoretical and practical conclusions and implications on the basis of our re-interpretation of sorting.

A framework for understanding the role of sorting

In his early publications Alderson discusses the marketing system's task of bringing together heterogeneous demand on the one hand and heterogeneous supply on the other (see e.g. Alderson 1957). He further states that some intermediate steps need to be taken in order to accomplish this 'match'. Sorting is a necessary part of these intermediate steps and contributes to economic effects that would be impossible to achieve if each and every segment of supply was to be matched with each and every

segment of demand. Alderson refers to sorting as the practice of breaking down or building up collections of goods, most often referred to as assortments. This means that sorting in this respect is about increasing or decreasing the homogeneity or heterogeneity in collections of goods.

Later on, he incorporated sorting in his transvection concept, which '*is generally regarded as his theoretical crowning glory*' (Brown 2002, p. 251). By introducing the transvection he linked sorting to the transformation of products. A transvection is defined as: '*...a single unit of action of the marketing system. This unit of action is consummated when an end-product is placed in the hands of the ultimate consumer, but the transvection comprises all prior action necessary to produce this final result, going all the way back to conglomerate resources*' (Alderson 1965, p. 92). In order to accomplish this, the conglomerates need to be physically transformed in various ways in order to land as an end-product in the hands of the ultimate consumer. Accordingly, two main types of activities are identified in transvections: transformations and sortings.

Transformation

Alderson & Martin (1965, p. 123) argue that: '*...a transformation is a change in the physical form of a product or in its location in time and space*...' On this basis, Hulthén (2002) makes a distinction between three types of transformations. First, transformations involved in refining conglomerate resources to an end-product in the hands of the user, are referred to as form transformation, including various production, assembly, and packaging activities. Second, place transformation is related to the physical movement along the transvection to the end-user, involving activities such as transportation and various handling operations, e.g. loading and unloading. Finally, time transformation is concerned with how the successively refined product is transformed in time, for example with regard to times of delivery and storage. Hence, the characteristics of a product change along the transvection as it undergoes transformations in form, place, and time. It begins as conglomerate resources and lands as an end-product in the hands of the ultimate consumer. Each transformation thus changes the features of the product as it appears as a new transformation output.

Sorting

Before each transformation, the product needs to be directed towards the appropriate transformation facility (Alderson 1965). This is where sorting becomes crucial, because sorting is the 'decision aspect of marketing' (Alderson 1965, p. 34). Hence, each transformation needs to be preceded by sorting and thus,'*...two transformations cannot appear successively without an intervening sort.*'. (ibid., p. 94). Alderson makes a distinction between two types of sorting: assignment and selection. 'Assigning' means directing a product to the facility to be used for the next transformation (a machine, a warehouse, a trailer, etc.). By assigning different products to the same facility it is possible to reap economies of scale through improved resource utilisation,

The second dimension of sorting is identified as 'selecting' and is conducted from the buyer's point of view. The buyer selects a product to be included in its collection of goods. Assigning and selecting are closely related. For example, in retailing, products that serve a similar function are assigned to the same area in the store to simplify the consumer's selection activities. These products might have the same basic function but differ in other dimensions, for example in terms of brand and physical form. The buyer selects a particular product to create a collection of goods that is valuable from its point of view.

Sorting in transvections

In transvection sconglomerate resources are alternately sorted and transformed in time, place, and form into what eventually ends up as an end-product in the hands of the end-user. It is important to observe that sorting is a decision activity but still highly related to the physical handling of products because it determines the next transformation. In line with the discussion above, a transvection can be conceptually sketched as outlined in Figure 1.

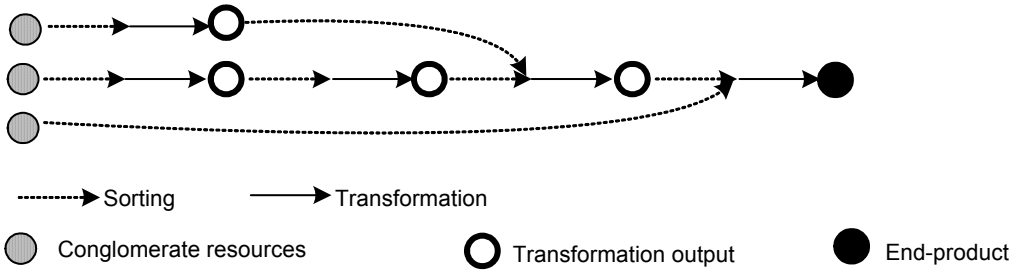

Figure 1. A conceptual illustration of a transvection (Source: Hulthén 2002)

Each transvection activates what Hulthén (2002) labels transformation resources (e.g. equipment for production, transportation and material handling), and sorting resources (e.g. product information, production plans, data bases, business systems, sales statistics). As sorting is about assigning products to transformation resources, *'sorting means making use of this transformation resource structure*' (ibid., p. 199). This resource structure might be used in a multitude of ways which means that there are numerous opportunities available for sorting in a particular transvection. Therefore, the transformation activities in a transvection must be 'sorted' in a way that makes the transvection efficient in some respect. There are two principles to consider in these efforts. The first concerns the efficient undertaking of the single activities in a transvection. The second is related to the sequential co-ordination among the activities in the transvection.

The efficiency of a single activity is mainly determined by the scale of the operations. Economies of scale are captured when the similarity among activities increase (Richardson 1972). Activities are similar when they make use of the same resource element. Sorting, thus, has an obvious impact on the degree of similarity (Hulthén 2002). Mass production and mass distribution follow from ambitions to increase similarity. This logic is what underlies what is often referred to as the 'principle of speculation' (see e.g. Bucklin 1965). According to this principle, differentiation *'in form, and the movement of goods to forward inventories, should be made at the earliest possible time in the marketing flow*' (ibid., p. 68).

The second aspect of sorting in transvections relates to the sequential coordination among the activities. When transformation activities are directed towards a specific counterpart, they are defined as closely complementary (Richardson 1972). This means that the product gets an identity, which is the case for customer adapted production and distribution solutions. Close complementarity among activities sets some limitations for how a specific product can be sorted in relation to other products. This logic is what underlies the 'principle of postponement' where differentiation in form is postponed '*to the latest possible time in the marketing flow*' (Alderson 1950, p. 1). For a manufacturer the ultimate postponement would be to initiate production activities only when an order from a specific customer has arrived.

Sorting in the PC distribution network

This section analyses sorting in two different transvections in the PC-industry. The first deals with a ‘traditional’ channel where distributors and dealers are significant, while the second is based on what is usually identified as a ‘direct’ channel.

Transvection 1: a 'traditional channel'

This transvection deals with what is normally labelled an 'indirect channel' in the PC-industry and illustrates a 'traditional' type of transvection, common in industries characterised by mass production and mass distribution. This implies that there is no direct exchange between manufacturer and end-user. Instead a number of intermediaries are involved in handling the transactions. This specific transvection deals with an end-user that decides to buy a PC from a home electronics store. The store provides a broad assortment of pre-defined models of PCs. Hence, the main issue for the store is to create an assortment of various products, implying that the form dimension is 'locked' at an early stage. In the store, a salesman (a sorting resource) assists the customer in the selection of a product, thus giving the PC its end-user identity. The transvection in Figure 2 illustrates how this PC eventually ends up at the specific end-user.

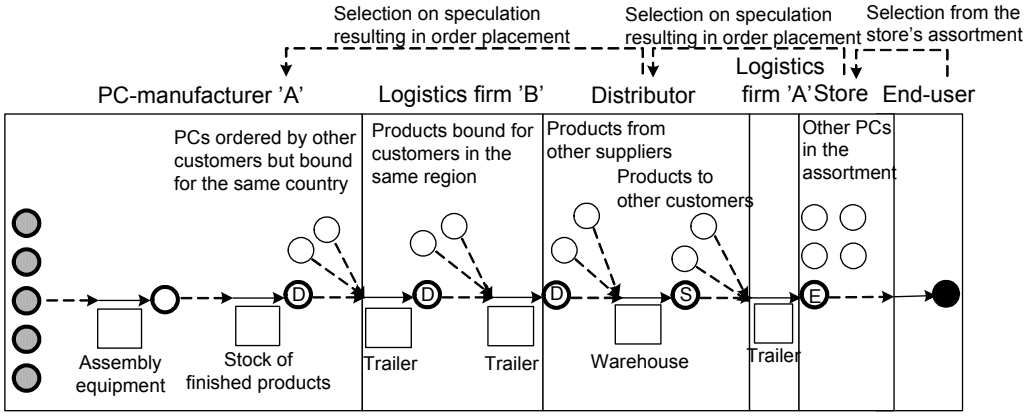

Figure 2. A simplified illustration of transvection 1

The specific PC was ordered by the store from a distributor as part of a large batch of products. This selection, manifested in an order, is based on information from the distributor concerning for example prices, and delivery times, as well as on the store’s own sales statistics. When the order is placed the products are assigned the identity of the store. The PC is then assigned to a trailer, operated by logistics firm 'A'.

The PC is co-packed with other products, which are potentially alike in place and time, i.e. they are bound for the same geographical region at about the same time. When the PC arrives it is stored until the end-user selects and purchases it.

The distributor, in turn, bought the PC as part of a larger batch of the same type from PC manufacturer 'A'. The distributor's selection of what to buy is based on information accessed through interaction with different customers and the supplier and is limited to quantitative aspects concerning how many to order and what pre-defined models to order. Hence, this type of transvection does not provide any opportunity for customers to influence the choice of conglomerate resources (components). The selection made by the distributor, is consequently a result of speculation. The PC is then assigned to a trailer, operated by logistics firm 'B', bound for the country in which the distributor is located. The PC is then transferred to a logistics hub operated by the same firm. The main activity in this facility is re-loading, i.e. the PC is assigned to another trailer bound for the distributor's warehouse. The PC is then stored in the warehouse until the order arrives from the store.

The production of PCs is also made on speculation. Consequently, the manufacturer decides what models and quantities to produce on the basis of sales forecasts. The standardisation of products in the form dimension to a number of predefined models provides the manufacturer with opportunities for capturing economies of scale in form transformation.

The many changes in identity from the manufacturer, to the distributor, to the store, and finally to the end-user, means that the transvection is successively coordinated in different 'steps'. The many changes in identity provide opportunities for the products to be sorted in time and place together with products in other transvections. This is possible because this transvection allows no adaptations in form, place, time, and identity from an end-user point of view. These limitations provide the opportunities for the capturing of economies of scale owing to the similarity in relation to activities belonging to 'equivalent' transvections. Furthermore, the stocks at the manufacturers, distributors, and the stores serve as buffers in the material flow. These buffers provide a necessary flexibility since the transvection is not locked to only one identity. In this case the main coordination of sorting and transformation activities is firm-internal, where each firm focuses on improving economies of scale in its own operations. By accessing information from various sorting resources, each firm tries to coordinate its internal sorting and transformation

activities as efficiently as possible with regard to their operations. Sorting, therefore, mainly becomes an internal issue in this kind of transvection.

Transvection 2: a 'direct channel'

This transvection illustrates what is labelled a 'direct channel' in the PC-industry. This implies that the manufacturer has a direct contact with the end-user (Figure 3).

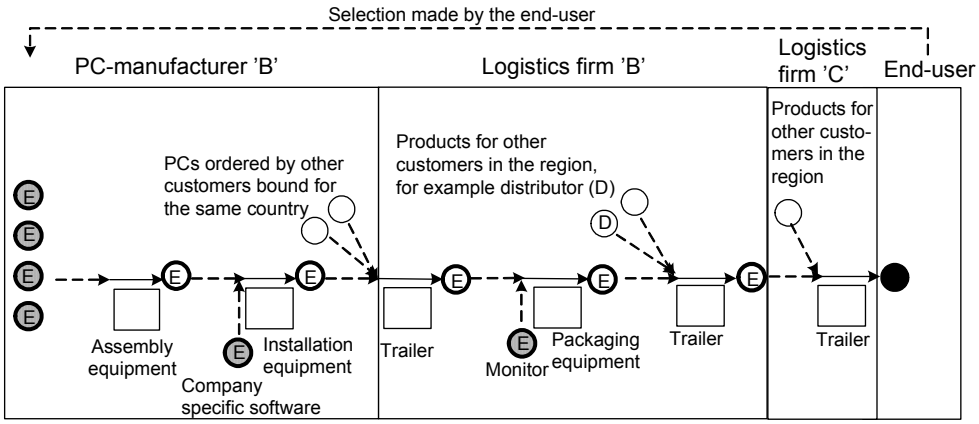

Figure 3. A simplified illustration of transvection 2

This specific transvection deals with an end-user who can select the components to be included in the PC, i.e. in contrast to transvection 1 this end-user can influence the form features of the product. When the PC is ordered an order number is generated that links the identity of the specific end-user to the order. This means that when assembly is initiated, the components are picked and assigned to this specific end-user. Hence, the conglomerate resources (components) get the identity of the end-user as soon as assembly is initiated. Consequently, the activation of the transvection is characterised by postponement in form, place, and time with regard to the end-user as no transformations or sortings are activated without orders from end-users. After assembly the PC is assigned to a trailer in accordance with its geographical destination, i.e. its features in the place dimension. The trailer transports the PC to the same logistics hub as in transvection 1, operated by logistics firm 'B'. The hub is consequently a transformation resource that is shared between the two transvections. The PC is then reloaded and assigned to a new trailer bound for the region in which the end-user is situated. At this time, the PC involved in transvection 1 might also be assigned to the same trailer if the warehouse of the distributor is situated in the same

region, i.e. if they are alike in place and time. The PC is then transported to a local re-loading hub, operated by logistics firm 'C', where it is assigned to another trailer and transported to the end-user's facility.

In contrast to transvection 1, the product does not change identity along its way from conglomerate resources to end-product. This means that the transvection is activated only once, when the end-user order is placed. Postponement reduces the risk associated with stock keeping, in turn requiring thorough coordination of the activities involved. Compared to transvection 1, this coordination is not primarily an internal issue, but requires extensive coordination of closely complementary activities across the boundaries of several firms. The challenge in this type of transvection resides in delivering an end-product with the features desired by the end-user. These features include form (product characteristics), time (delivery time should be as expected), and place (the end-product should end up as decided). In order to accomplish this, extensive information exchange is needed. This is achieved mainly through access to the business systems of the counterparts. For the companies involved, information concerning each single transvection and its features is crucial in order to coordinate this transvection in relation to other transvections in which they are involved.

Concluding discussion

We began this paper by stating that Alderson's sorting is an important concept for the understanding of marketing in general and distribution in particular. We further argued that the original concept has not been exploited to its full potential. Previous applications are mainly concerned with the relationship between assortment building, physical distribution, and warehousing activities in channels based on the principle of speculation. In these situations the opportunities for sorting in the place and time dimensions are almost endless because the end-user identity is not determined until the ultimate consumer's purchase. On the other hand, transformation in the form dimension cannot be considered. Our analysis of transvection 1 confirms that sorting in this traditional sense is crucial for the efficiency in distribution arrangements based on mass production, mass distribution and, thus, speculation. In this case sorting is mainly about building assortments in line with the traditional interpretation of the concept, i.e. sorting out, allocation, assorting, and accumulation. Accordingly, sorting is primarily a firm-internal issue related to the transformation in time and place.

As shown in this paper the sorting concept has much wider applicability. Aldersonian sorting provides opportunities for analysing other principles of distribution as well. Transvection 2, based on the principle of postponement, illustrates that sorting is a most useful concept for understanding the prerequisites for efficiency in customised operations. In particular, this 'extended' use of the concept allows for analysing the implications of sorting in the form dimension. In fact, sorting is even more crucial for efficiency in distribution arrangements based on postponement than in those relying on speculation.

Sorting in customised operations

The main objective of this paper is to illustrate the usefulness of the sorting concept in transvections characterised by postponement. In these distribution arrangements sorting is not an issue of creating assortments because there are no predetermined product characteristics and assortments to allocate in time and place. In this case sorting in relation to transformations in form becomes a crucial issue.

The real challenge in customisation is not to provide individual customers with unique solutions – but to do this at reasonable cost. The main problem for the supplier is that once customisation in the form dimension is undertaken the end-user identity of the product is determined. Assigning the product to a specific end-user at an early stage of the transvection restricts the opportunities for assigning in the place and time dimensions. These conditions set limits for economising in the handling of the product, in particular because the activities in the remaining part of the transvection are closely complementary. Therefore, postponement of form transformation requires that transformations in place and time are organised in relation to this 'locked' identity.

Sorting is crucial for economising in customised operations in two ways. Firstly, sorting in relation to transformation and sorting resources determines the efficiency and effectiveness in single transvections. Particularly, the close complementarity among the activities in customised transvections call for co-ordination actions. Secondly, sorting in single transvections impact on the utilisation, and thus the efficiency, of the whole set of transformation and sorting resources. In our examples from PC-distribution both transvections made use of the same trailer and the same logistics hub. Transformation resources where two or more transvections meet are identified as ‘crossing-points’ by Hulthén (2002). It is the

occurrence and utilisation of these crossing-points that determine economic performance in the distribution arrangements. Sorting among transvections thus affects the similarity in the utilisation of transformation and sorting resources. These efforts of establishing crossing-points must be balanced against the end-user requirements concerning customised solutions.

Implications

The organisation of a single transvection and its connections in crossing points requires co-ordination across the boundaries of several firms. This is because firms involved in transformation operations (either in form, time or place) tend to specialise in a limited part of the activity structures in which they are involved. In these network structures there is no clear division between 'production' and 'distribution'. Transformations in the form dimension may be undertaken anywhere in a transvection. Sometimes they are conducted by firms that we normally identify as manufacturers, while in other cases retailing firms may be responsible for final assembly. Similarly, for a manufacturer relying on distribution through a so-called direct channel the main challenge resides in organising transformations in place and time. However, as illustrated by transvection 2, these distribution arrangements are more 'network like' than 'channel like'.

Therefore, conceptualising emerging distribution arrangements as sets of crossing transvections provide major benefits from an analytical point-of-view. In particular, such models avoid the problems in making artificial distinctions between production and distribution, as well as between producers and distributors. In these frameworks sorting in its fundamental and original definition as the 'decision aspect' of marketing including the two subcategories selecting and assigning is a most useful concept.

Recent changes in distribution reality, particularly the development of 'direct channels', have made researchers in the area doubtful about the value of established models and frameworks. In most cases the authors advocate the need for developing complementary conceptualisations. Our analysis of Aldersonian sorting has convinced us that the best understanding of a 'new' distribution reality might be provided by an 'old' and partly neglected concept.

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