

Matching Electronic Distribution Channels to Product Characteristics: The Role of Congruence in Consideration Set Formation

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This article studies the determinants of whether consumers will consider new delivery vehicles for banking services. Building on the brand equity literature, a model is developed that suggests that consideration will depend on consumers' preference for the banking service, their preference for the distribution method, and the perceived congruence or fit between the distribution method and the banking service. Preference for banking services and distribution methods can be further decomposed into the utility of their perceived attributes and the associated information uncertainty. In an application, we find support for the model. Although preference for the distribution method (or delivery vehicle) is important and statistically significant, its influence is secondary to consumers' perceptions of whether the method is appropriate to the service to which it is being applied. This suggests that managers should seek to build up consumers' perceptions that new shopping methods are appropriate vehicles for delivering their services rather than trying to boost preference for the distribution method itself. J BUSN RES 1998, 41.223-229 © 1998 Elsevier Science Inc.

The Information Superhighway is fast becoming a technological reality. Its entry into every home, office, and public place is imminent. It has the potential to profoundly impact the ways in which the retailing, banking, and energy sectors conduct their business. Whereas the technological feasibility of changing the way commerce is conducted is unquestioned, consumer acceptance of the resultant new distribution methods is almost totally unknown. The role

of consideration as an important aspect to the adoption of innovative, high technology products is well established (e.g., Urban, Hulland, and Weinberg, 1993). This article explores the determinants of consideration of new means of distribution for existing services in terms of preference for the service, preference for the distribution vehicle, and the fit between the service and the distribution method, as viewed by consumers.

We separately examine the structure of existing beliefs about banking services and different distribution methods. We then model preference for different banking services and preference for delivery vehicles in terms of their respective perceptions and the information uncertainty associated with them. Finally, we look at the congruence between these two elements of the purchasing decision to establish whether consumers are likely to consider various distribution vehicles for specific banking services.

Distribution methods may be either traditional (banks, shops, etc.) or electronic. Electronic shopping methods provide new distribution vehicles to suppliers and include traditional telecommunication services (such as the telephone, facsimile); data communications (e.g., personal computers with modems); and sound and vision systems (including interactive television and videophone). Commercial services that are being developed to use these media include home banking, general goods retailing, and energy control. In this article, we examine solely consideration of various banking services. As the convergence of different electronic technologies makes the distinction between information delivery vehicles less meaningful, the extent to which each one will be able to drive the consumer choice process will depend (in part) on its perceived appropriateness for (or congruence with) the services it provides. This article proposes and tests a methodology for measuring that congruence and tests its effect on determining consideration of different distribution methods for access to banking services.

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The article proceeds by a literature review that discusses previous approaches to understanding technological adoption, as well as motivating the importance of congruence as a determinant of consideration and choice. Following development of the consideration model, details of the data collection to test it are provided. The analysis is undertaken in three parts:

1. The first part of the analysis examines perceptions of, and preference for, different modes of shopping (distribution vehicles).
2. Following the analysis of distribution vehicles, the structure of consumer perceptions for different banking services is derived, and their relation to preference is analyzed.
3. Finally, the fit between these two different elements of the marketing mix, the service and the distribution vehicle over which it is delivered, is tested. This establishes the congruence between different forms of banking service and the shopping modes that consumers might use to access them. The effect of congruence, preference for the shopping mode, and preference for the banking service on consideration is tested using a logit model.

Following the results of applying the model, the managerial implications that arise from its application are discussed.

Literature Review

Models for forecasting the acceptance of new technological innovations may be classified according to a number of dimensions (e.g., Mahajan and Wind, 1986). We focus on the first two criteria they use; time/space and units of analysis. In terms of time, models may be either static or dynamic. Thus, conjoint analysis and discrete choice theory are static models that aim to understand a new product's appeal at any point in time (for a review of these, see Roberts and Lilien, 1993). They may be contrasted with dynamic models, which look at the adoption of new products over time. The most popular of these are diffusion models, a comprehensive review of which is included in Mahajan, Muller, and Bass (1990).

Preference and choice models have the advantage that they are usually calibrated at the individual or segment level, making them highly diagnostic for the marketing manager in assessing how different elements of the marketing mix might affect different members of the adopting population. Diffusion models have the advantage that they explain the trajectory of sales over time, thus assisting in business planning.

Both types of model experience difficulties in being calibrated prelaunch, particularly for radically new products. A number of approaches have been advanced to address this problem. These include using analogous products, which have already diffused (Lawrence and Lawton, 1981); using sophisticated members of the population known as leading edge users

(von Hippel, 1986; Morrison, 1995); giving consumers experience with new products in field trials (Dolan and Mathews, 1993); and artificially educating consumers in the laboratory, using information acceleration techniques (Urban, Weinberg, and Hauser, 1996).

This article is concerned with the consumer decision process at any point in time. It builds on preference and choice models to study how one stage of the consumer choice process, consideration, is different for really new products and how the product itself and the distribution channel it uses interact in the consideration process. Although the model is static, like other new product choice models it can be applied at any point during the diffusion process.

The adoption of new products at any point in time has been shown to depend on a number of factors. Primary among these are product attributes and consumer perceptions of those attributes (e.g., Fishbein, 1967; Lancaster, 1966) and information uncertainty (e.g., Roberts and Urban, 1988). These correspond to the characteristics of relative advantage advanced by Rogers (1995) and perceived risk (Bauer, 1960). Ways of examining the structure of beliefs include multidimensional scaling and factor analysis (Roberts and Lilien, 1993). Data collection methods for use in these techniques include attribute ratings, similarity ratings, and card sorts (Urban, Weinberg, and Hauser, 1996). In addition to the two major factors of perceived attributes and information uncertainty, there are other factors that will determine the speed of diffusion. For example, Rogers (1995) suggests observability, trialability, complexity, and compatibility may also be important in the product's successful diffusion. Compatibility may be physical compatibility (for example, whether software will run on existing hardware) or it may be perceptual compatibility (for example, whether it seems right to leave voicemail). Concepts related to perceptual compatibility or congruence have been attracting a considerable amount of attention in the marketing literature over the last 10 years. For example, Bridges (1992) has stressed the importance of perceived fit when extending an existing brand name into new products. Sujan and Bettman (1989) talk of discrepancy to demonstrate a similar effect in moderating choice. The categorization literature has emphasized consistency with exemplars or stereotypes in the category when looking at the acceptance of new products in fast developing categories (e.g., Urban, Weinberg, and Hauser, 1996).

Model Development

The consumer choice process can be thought of as consisting of a number of steps (e.g., need arousal, awareness, consideration, perceptions, preference, purchase, and post purchase feelings). See Roberts and Lilien (1993) for a review. The importance of including a consideration stage for accurate forecasts and diagnostic analysis has been shown in a number of studies (e.g., Gensch, 1987; Roberts and Lattin, 1991). Specifically for really new products, Urban, Hulland, and

Weinberg (1993) argue the importance of a consideration phase. With our model, we provide two advances. Firstly we develop a model of consideration for really new products. Secondly we include the distribution channel as an element important to the consideration process.

The modeling approach we take is to model preference for distribution methods in general, and banking services in general, separately. The latter model represents a standard application of the belief importance model (Roberts and Lilien, 1993). The former, decomposing preference for channels of distribution into their underlying characteristics is more unusual. Consideration of a given delivery vehicle for a particular banking service can then be modeled in terms of the preference for the delivery vehicle, the preference for the banking service, and the congruence or fit between the banking service and the delivery vehicle.

The model for preference is the belief importance model modified to incorporate information uncertainty (Roberts and Urban, 1988):

$$U_{BS} = \alpha + \sum_j \beta_j y_{BSj} - \frac{r}{2} \sigma_{BS}^2 \quad (1)$$

$$U_{DV} = \alpha' + \sum_k \beta'_k y_{DVk} - \frac{r'}{2} \sigma_{DV}^2 \quad (2)$$

where

- U_{BS} = Preference for banking service, BS
- U_{DV} = Preference for delivery vehicle, DV
- y_{BSj} = Perceived level of attribute j in banking service, BS
- y_{DVk} = Perceived level of attribute k in delivery vehicle, DV
- σ_{BS}^2 = Information uncertainty associated with banking service, BS
- σ_{DV}^2 = Information uncertainty associated with delivery vehicle, DV

$\alpha, \beta_j, r, \alpha', \beta'_k, r'$ are parameters. The β and β' parameters are referred to as importance weights, while r and r' represent the consumer's risk aversion (Keeney and Raiffa, 1979).

The attributes, y , may either be elicited directly from respondents or the result of a perceptual map from some reduced space using factor analysis, multidimensional scaling or similar technique. Given the preference for banking services (equation 1) and the preference for delivery vehicles (equation 2), consideration for using a given delivery vehicle, DV, for a specific banking service, BS, may be explained using a logit model (Horowitz and Louviere, 1995):

$$P_{Consid(BS,DV)} = \frac{\exp(\alpha'' + \gamma_{BS}U_{BS} + \gamma_{DV}U_{DV} + \gamma' C_{BS,DV})}{[m + \exp(\alpha'' + \gamma_{BS}U_{BS} + \gamma_{DV}U_{DV} + \gamma' C_{BS,DV})]} \quad (3)$$

where

$P_{Consid(BS,DV)}$ = Probability of considering delivery vehicle DV for banking service, BS

$C_{BS,DV}$ = Perceived congruence (fit) for DV as a delivery vehicle for banking service, BS

$\alpha'', \gamma_{BS}, \gamma_{DV}, \gamma', m$ are parameters.

m may be interpreted as a benchmark utility reflecting the costs of search and the utility of other distribution methods; the probabilistic analog of Roberts and Lattin's threshold utility (1991).

Thus, as a first step to understanding choice, we have explained how likely a consumer is to consider a new form of distribution method for various banking services. Once consideration is established, the search process begins and choice at the end of the search process can be estimated using information acceleration techniques (Urban, Weinberg, and Hauser, 1996).

Empirical Testing

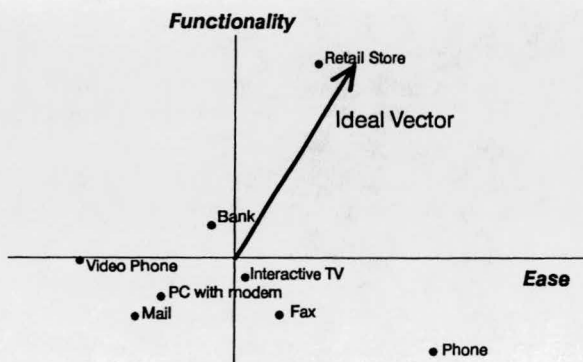
To understand perceptions of banking services, distribution methods, and the relationship between the two, we studied 120 residential customers of information services and banking products. Respondents were all undergraduate students and were screened on the basis of some knowledge of information technology products and also the use of financial services. The students were regular users of the banking services tested, they had a generally good knowledge of the distribution vehicles involved, and they did not present a problem with non-response or motivation. There is no reason to believe that they use different choice processes to other members of the population, even if their levels of consideration and preferences were different. Thus, given the objectives of the research, as Calder, Phillips, and Tybout (1981) argue, they form an appropriate population for testing the model. All respondents completed a 17-page survey, and 93 useable responses were obtained. Perceptions, levels of familiarity, and preference were elicited separately for each delivery method and each banking service. In addition, appropriateness and consideration of distribution vehicles for different banking services were collected. Attributes and appropriateness scales were pretested on a pilot sample of comparable size. Attribute perceptions were elicited on a 5-point Likert scale, whereas preference was measured on a 100-point thermometer scale (e.g., see Roberts and Urban, 1988). The appropriateness measure used a 7-point verbally anchored scale from "not at all appropriate" to "highly appropriate," whereas consideration was bipolar (yes/no). Questions regarding banking services and distribution vehicles were rotated for half the respondents to avoid the possibility of sensitization. There were no significant order effects.

Table 1. Perceptions of Delivery Vehicles

	Factor 1 Ease	Factor 2 Functionality	Communality
Convenient to access	0.83	0.08	0.69
Quick to use	0.78	0.02	0.60
Not a lot of hassle	0.77	0.20	0.63
Easy to use	0.68	0.30	0.55
Provides a flexible service	0.55	0.43	0.49
Easy to compare product characteristics	-0.00	0.82	0.67
Provides interactions with others	0.01	0.78	0.62
A method I feel comfortable with	0.35	0.77	0.72
Provides a wide choice of products	0.24	0.63	0.45
Is secure	0.36	0.54	0.42

Analysis of Delivery Vehicles: Perceptions and Preferences

To understand whether consumers would consider a specific delivery vehicle, DV, for a given banking service, BS, we first understand perceptions of, and preference for, that delivery vehicle as a whole, independent of the service that it is being used to provide. Eight distribution methods were analyzed using attributes gained from qualitative research and refined by a pilot test. Ten attributes were factor analyzed to provide two underlying dimensions as illustrated in Table 1. The two dimensions (after Varimax rotation) could be described as *ease* and *functionality*. This is consistent with Hauser's (1984) study of the structure of perceptions of communications methods. The position of the different telecommunications delivery modes on the two factors is illustrated in Figure 1. Figure 1 shows that telephone is seen as easy to use but not strong on functionality. Retail stores are high on functionality but not easy to use. Banks are not perceived as being as functional or easy to use as retail stores, but remember that these perceptions refer to general retail products, not specifically to banking services. Note that other home-based shopping methods do not fall on the efficient frontier, being dominated by retail stores on both factors.

**Figure 1.** Perceptions and preference for delivery vehicles.

Having studied the perceptual structure of different shopping modes, we progress to understanding preference among them. The most preferred distribution vehicle was retail stores followed by banks, mail, interactive TV, phone, PC with modem, and videophone, with fax being least preferred. We can now relate preferences to factor perceptions and familiarity using preference regression (Urban and Hauser, 1993). Familiarity may be regarded as an inverse measure of information uncertainty (e.g., Roberts, 1983). Using the notation established in the model development section:

$$U_{DV} = 22.4 + 5.0 \cdot \text{Ease}_{DV} + 8.8 \cdot \text{Functionality}_{DV} + 9.3 \cdot \text{Familiarity}_{DV} + e_t \quad R^2 = 0.40$$

(7.9) (3.8) (6.5) (11.1)

where e_t is an error term. Figures in brackets are t-statistics.

Functionality outweighs ease of use, explaining why telephone, despite its ease of use, is not more highly preferred. The relative importance of *ease* and *functionality* is represented by the slope of the ideal vector in Figure 1.

From an analysis of shopping delivery vehicles, it would appear that innovative products are going to have a difficult job not only to overcome traditional barriers to adoption faced by any innovation (Rogers, 1995), but also to establish the benefits and positioning necessary to have a high equilibrium share at saturation. To understand whether this is likely to be a significant problem specifically with respect to banking products, we examined the perceptions of banking products, and then we looked at the relationship between banking products and telecommunications' delivery vehicles in terms of fit.

Analysis of Banking Services: Perceptions and Preferences

Banking services were also analyzed first by studying the nature of perceptions using factor analysis and then by relating preference to the resultant factors and to information uncertainty using preference regression. Nine attributes were factor analyzed using principal components with varimax rotation,

Table 2. Perceptions of Banking Services

	Factor 1 Benefits	Factor 2 Low Cost	Communality
Useful in a wide range situations	0.82	-0.18	0.71
Useful part of range of banking services	0.82	0.17	0.71
A bank service I feel comfortable with	0.80	0.25	0.71
Easy to use	0.79	0.23	0.68
Highly relevant to my needs	0.76	0.30	0.67
Provides me with good liquidity	0.74	0.13	0.57
Is a sensible financial service to use	0.72	0.33	0.62
Easy to establish/set up	0.57	0.47	0.54
Does not involve significant bank charges	0.08	0.94	0.89

resulting in two factors illustrated in Table 2. The two factors were level of benefits the service offered and the cost of maintaining the service. A perceptual map of where the different banking services fall on these dimensions is given in Figure 2. Savings accounts are seen to have a low associated cost but offer only moderate benefits, whereas credit cards offer a high level of benefits but are seen as having much higher charges. Check accounts and loans that provide short-term and long-term liquidity, respectively, are not perceived as offering benefits to the respondent group, but debit cards offer reasonable benefits (access to cash) at a moderate price. A preference regression which incorporates both of these factors, together with information uncertainty (as measured by familiarity), showed all variables to be statistically significant:

$$\begin{aligned}
 U_{BS} = & 39.9 + 13.2 \cdot Benefits_{BS} + 3.0 \cdot Cost_{BS} \\
 & (8.8) \quad (8.2) \quad (2.1) \\
 & + 7.6 \cdot Familiarity_{BS} + e_t \quad R^2 = 0.46 \\
 & (6.4)
 \end{aligned}$$

Figures in brackets are t-statistics. The trade-off between benefits and cost is illustrated by the ideal vector in Figure 2, with benefits being far more important than cost (with a ratio of 13.2/3.0).

Consideration of Banking Products via New Distribution Methods

Consideration for using a particular delivery vehicle for a specific banking service was estimated using equation 3; by relating stated consideration to the underlying preference for distribution vehicles, the underlying preference for the banking service and the perceived congruence between the service and the distribution network over which it was being delivered. The congruence between different banking products and methods of delivery was examined using a 7-point verbally anchored scale from not at all appropriate to highly appropriate. All 48 delivery vehicle-banking service pairs were evaluated on this scale.

The appropriateness of different distribution vehicles for the eight different banking services was analyzed using multi-dimensional scaling (Norusis, 1995). The resulting map showing the perceptual closeness of different delivery vehicles for different banking services is presented in Figure 3. From Figure 3, we see that there is little discrimination among the six banking services, but considerable spread in the delivery vehicles. That is, if a delivery vehicle is appropriate for one banking

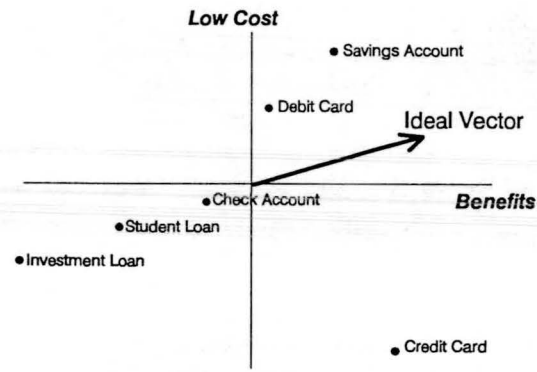


Figure 2. Perceptions and preference for banking services.

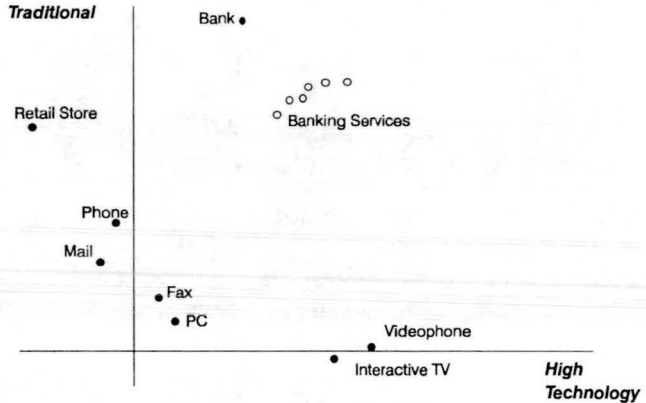


Figure 3. Perceptual Fit of Banking Services and Distribution Vehicles.

Table 3. Consideration Model for Using Different Delivery Vehicles for a Given Banking Service

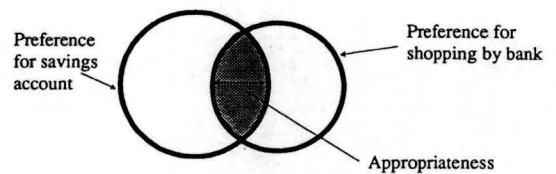
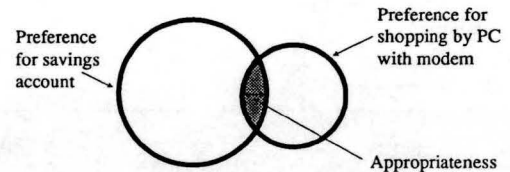
		Standardized	
		Parameters	Parameters
Constant	α''	1.148	
Preference - delivery vehicle (DV)	γ_{DV}	0.006	4.14
Preference - banking service (BS)	γ_{BS}	0.010	7.31
Appropriateness of DV for BS	γ'	0.606	27.42
Log likelihood		-1999	
Percentage correctly classified		74.7%	

service (close on the perceptual map), it is likely to be reasonably appropriate for them all. However, there are marked differences in how appropriate the different distribution vehicles are for banking services.

After rotation the two dimensions that distinguish between distribution vehicles on the basis of appropriateness may be interpreted as *high technology* and *traditional*. Given the positions of banking services in Figure 3, the distribution vehicles that are going to be most appropriate for them are those of low to medium technology and fairly, but not totally, traditional. Banks are seen as too traditional and not high tech enough to be perfectly appropriate. All other services are seen as being too radical with retail, phone, and mail as being on the low side of desired high technology and videophone and interactive TV as being on the high side. The appropriateness measures analyzed and illustrated in Figure 3 were then used to fit the logit model of consideration. The dependent variable was stated consideration. Fitting equation 3 resulted in the model shown in Table 3. All variables are statistically significant at $p = .0000$, and the classification rate of 75% compares well with random allocation (which would yield 52% correctly classified). Some measure of the relative strength of the determinants of consideration may be seen from the standardized parameters (γ/σ_γ). Whereas highly preferred banking services are more likely to be considered for any distribution vehicle, measured by γ_{BS} (and this is a somewhat stronger effect than the difference between distribution vehicles, measured by γ_{DV}), the appropriateness of the delivery vehicle to the specific banking service, measured by γ' is the single strongest factor in determining consideration.

Summary and Conclusions

Consumer consideration of home shopping (and in particular home banking) and other high technology telecommunications products depends on three factors: relative advantages or benefits of the delivery vehicle, relative advantage of the banking service, and compatibility (the congruence between the two). Preference for distribution vehicles and banking services can further be decomposed into their constituent perceptions and the information uncertainty associated with them. This model may be illustrated using a Venn diagram.

**(a) Consideration of savings account using a bank****(b) Consideration of savings account using a PC with modem**


 Degree of Consideration is shown by the size of the shaded area

Figure 4. Illustration of the components of the consideration model: Product preference, delivery vehicle preference, and appropriateness of the delivery vehicle to the product.

Preference for the two delivery vehicles (a *bank* and a *PC with modem*) are represented in Figure 4, as is preference for a savings account. The degree to which the circles overlap indicates the appropriateness of the distribution vehicle to the service. The shaded area in the middle depicts consideration and is a function of the size of the two circles and how much they overlap. The results of this study indicate that the relative advantage of innovative telecommunications media (i.e., distribution methods) is yet to be established (see Figure 1). This will be one factor slowing the adoption of services over electronic media. A second barrier to adoption is the perceived fit between banking and the use of new telecommunications services. That fit varies by type of banking service and the delivery vehicles used. However, in no instance is it perceived as being comparable to that of using a bank branch. Comparing these determinants of consideration in the logit model suggests that the issue of appropriateness is more critical than the consumer's overall attitude to the new delivery vehicle.

For example, if we calculate the difference between the probability of consideration for operating a savings account using a bank, and the probability of consideration for operating a savings account using a PC with modem (based on the preferences for the banking service and the delivery vehicles; the appropriateness of the delivery vehicle for the banking service; and the parameters from fitting equation 3), we find that only 9% of the difference is due to the preference of banks as a method of shopping over PCs, whereas 91% is due to the fact that PCs are not seen as an appropriate way to operate a savings account relative to a bank.

The management implications of this specific illustration are that home banking services have to spend more effort in

explaining the fit between PCs and operating savings accounts relative to that put into getting preference for the PC as a distribution vehicle. More generally, Roberts and Lattin (1991) have established the importance of consideration in choice. Urban, Hulland, and Weinberg (1993) demonstrated that this is particularly critical with high technology products. This research shows that the utility added by two different elements of the marketing mix, the product and its distribution, are important. What is much more important, however, is the fit between them. Moreover, that is currently a major weakness for most high technology delivery vehicles (e.g., see Figure 3). Managerial actions to establish fit, appropriateness, or congruence may include use of role models and celebrities in advertising strategies, inducements to trial, and harnessing of publicity and public relations.

This study has a number of limitations. It only looks at one part of the consumer decision process: that of consideration. It is a static model and does not examine the dynamics of beliefs as consumers go through search and evaluation once consideration has been established. However, despite these limitations, we have established the importance of fit between two elements of the marketing mix, the product and the distribution vehicle, in one important part of the consumer decision process for evaluation and choice of new high technology products.

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