Factors Influencing E-Banking Adoption in India: An Amalgamation of TAM and TPB

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Abstract
E-banking has seen dramatic growth in the past several years and will continue to grow in the years to come. An increasing number of users are processing transactions online and the numbers are likely to increase rapidly in the near future. This study investigates factors influencing the acceptance of E-banking in India. The paper tries to offer insights about acceptance behavior of Indian customers. Technology Acceptance Model (TAM) is the primary basis for the study. We developed a theoretical model based on the Technology Acceptance Model (TAM) with theory of planned behavior (TPB) model. A questionnaire is designed and used to survey a randomly selected sample of customers. Due to the quantitative nature of the study, the results are analyzed with statistical measures. Hypotheses are developed from extant literature; these indicate possible associations among the constructs of the model. A total of 238 questionnaires are given out on random basis. However incomplete questionnaires been taken out. The actual sample used for the study is 140 respondents. Structured Equation Modeling (SEM) is used to evaluate the potency of the hypothesized relationships; the results support integration of TAM and TPB models and confirm its strength in predicting customers' intent of acceptance of E-banking. The results indicated that the intention to use E-banking is positively affected by perceived behavioral control and perceived usefulness.

Keywords
Perceived Usefulness, Trust, Privacy, E-business, TAM.

I. Introduction
In 30 June, 2012 2,405,518,376 of the total world population (7,017,846,922) was using the Internet. This means that approximately growth of internet usage from 2000 to 2012 has been increased to 566.4 % (source: www.internetworldstats.com). These massive figures very well reflect the scope and size of this type of network. There is no other channel in the whole world bringing people so close to people, people so close to business or business so close to business than the Internet. As expected individuals, industries and businesses are utilizing the Internet. Apart from connectivity, there is a great amount of other prospects coming along with it. The Internet is used to enhance, or even supersede, product and service delivery processes considered as more traditional. Banking is not any different from other business areas, as banking in general is extremely information-intensive. Therefore Information Technology (IT) has an increasingly important role in modern banking of any kind, especially when directly accessible by the bank's customers.

In the world of banking, the development of information technology has an enormous effect on development of more flexible payments methods and more-user friendly banking services. E-banking involves, consumer using the Internet to access their bank account and to undertake banking transactions. At the basic level, E-banking can mean the setting up of a web page by a bank to give information about its products and services. At an advanced level, it involves provision of facilities such as accessing accounts, transferring funds, and buying financial products or services online. This is called "transactional" E-banking (Sathye, 1999). In spite of the great benefits of the online banking, it is extremely essential that banks regard the risks associated with it. The banking industry is strongly associated with high levels of trust related to security and privacy issues in the physical environment. One significant step that banks must take before going through any transformation is to insure the proper handling of E-banking risk. But it is very difficult for both the customers and the banks to determine the best approach to use of online banking. A particular risk arises with trying to integrate new channels with existing channels.

II. Literature Review
E-business is now a standard in industry. The Internet is transforming marketing and trade (Shashank Rao, Goldsby, & Iyengar, 2009). Many companies have found successful ways for advertising, marketing, and distributing their products and services online. The internet environment has changed and still changing the rules of traditional business (Eid, Trueman, & Ahmed, 2002). The Internet is creating higher customer expectations and customers are expecting closer relationships (Chaston & Mangles, 2003). However, the emergence of the Internet does not change the need to establish strong customer relationships (Harrison-Walker & Neeley, 2004). Businesses still need to attract customers, build trust, and create satisfaction. Firms interact with their customers to build committed relationships.

Internet-based relationships seem to be sufficiently different from traditional relationships and therefore require specialized attention (Colgate, Buchanan-Oliver, & Elmsly, 2005). The Internet alters the customers' perspective of the benefits gained from that relationship. As a result of this, customers are transferring physical, tangible elements of a relationship into the intangible Internet environment. By doing this, they try to gain reassurance and strengthen the relationship. The Internet influences two types of bonds in a relationship. These are grouped into technical and social elements, or structural and social bonds (Sally Rao & Perry, 2003).

The Internet can be used effectively in a business-to-business context (Sally Rao & Perry, 2003) and the assessment of the technology impact on relationship marketing has largely been restricted to industrial marketing (McGowan, Durkin, Allen, Dougan, & Nixon, 2001). Business-to-business Internet marketing is concerned chiefly with communications and transactions conducted using Internet-based technologies. In the context of this research, business-to-business Internet marketing consists of online marketing communications and E-banking.

A. E-banking
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and to undertake banking transactions. At the basic level, Internet banking can mean the setting up of a web page by a bank to give information about its products and services. At an advanced level, it involves provision of facilities such as accessing accounts, transferring funds, and buying financial products or services online. This is called "transactional" E-banking (Sathye, 1999). In spite of the great benefits of the E-banking, it is extremely essential that banks regard the risks associated with it. One significant step that banks must take before going through any transformation is to insure the proper handling of E-banking risk. But it is very difficult for both the customers and the banks to determine the best approach to use of E-banking. A particular risk arises with trying to integrate new channels with existing channels.

In India, slowly but steadily, the Indian customer is moving towards E-banking. But they are very concern about security and privacy. In E-banking, trust plays a vital role. It is very difficult to analyze trust as a phenomenon and may be almost impossible to analyze trust in the context of electronic commerce because of the complexity and risk of electronic commerce. Trust will be the decisive factor for success or failure of e-business. Karake Shalhoub (2002) has studied a number of US-based firms to determine what she labeled trust enhancers. Her findings identified two main categories: privacy and security as the main determinants of trust in electronic commerce. Privacy has long been defined as the right of a person to be left alone and to be able to have control over the flow and disclosure of information about him or herself (Warren and Brandeis, 1890). Worries about privacy are not new, although businesses have gathered information about their customers for years. However, privacy issues often come about because of new information technologies that have improved the collection, storage, use, and sharing of personal information.

There are a number of reasons which are fundamental for the development and diffusion of E-banking (Pikkarainen, et al., 2004). The internet offers a potential competitive advantage for banks, this advantage lies in the areas of cost reduction and more satisfaction of customer needs (Bradley & Stewart, 2003 ; Jaruwachirathanakul & Fink, 2005). Encouraging customers to use the Internet for banking transactions can result in considerable operating costs savings (Sathye, 1999). The Internet is the cheapest distribution channel for standardized bank operations, such as account management and funds transfer (Polasik & Wisniewski, 2009). Customer dissatisfaction with branch banking because of long queuing and poor customer service is an important reason for the rapid movement to electronic delivery (Karjaluoto, et al., 2002). The commitment of senior management was also found to be a driving force in the adoption and exploitation of technology (Shiels, McIvor, & O'Reilly, 2003). Despite the many benefits that E-banking provides to both banks and their customers; acceptance of this technology has not been equal in all parts of the world (Karjaluoto, et al., 2002). And even though the vast number of existing studies and the growing interest in the introduction and development of Internet banking, very little is known about the variables that truly determine the adoption of Internet Banking (Hernandez & Mazzon, 2007). Acceptance and usage of E-banking in India is still considered to be low due to a number of reasons.

B. Theory of Planned Behavior (TPB)

The theory of planned behavior (TPB) suggests that a central factor in human behavior is behavioral intention, which is affected by attitude toward behavior, subjective norm, and perceived behavioral control (Ajzen, 1985, 1991, 2002). Subjective norm (SN) expresses the perceived organizational or social pressure of a person who intends to perform the behavior in question. In other words, the subjective norm is relative to normative beliefs about the expectations of other people. Perceived behavioral control (PBC) reflects a person's perception of the ease or difficulty of implementing the behavior in question. It concerns beliefs about the presence of control factors that may facilitate or hinder their performing the behavior. Numerous studies demonstrated the applicability of TPB to various content domains (Ajzen, 2001). Also the ability of TPB in providing a very useful theoretical framework for understanding and predicting the acceptance of new information technology is demonstrated. Abundant empirical evidence suggests that TPB effectively explains individual intentions and behavior in adopting new information technologies. Such evidence includes the acceptance of telemedicine technology by physicians (Chau et al., 2002), the widespread adoption of virtual banking (Liao et al., 1999), computer resource center adoption and usage (Taylor & Todd, 1995).

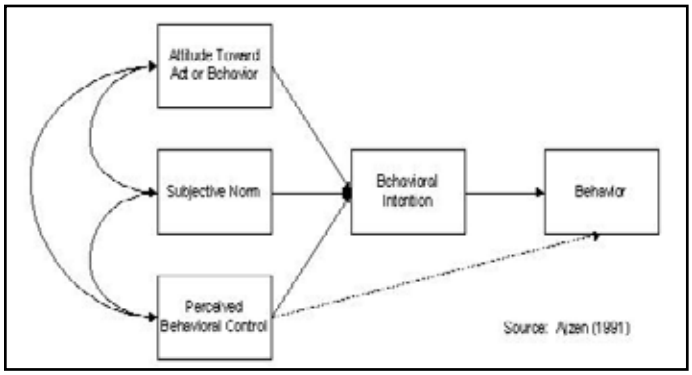

Fig. 1: The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes (Ajzen, 1991)

- TPB points that individual behavior is driven by behavioral intentions where behavioral intentions are a function of an individual's attitude toward the behaviour, the subjective norms surrounding the performance of the behavior, and the individual's perception of the ease with which the behavior can be performed (behavioral control).
- Attitude toward the behavior is defined as the individual's positive or negative feelings about performing behaviour.
- Subjective norm is defined as an individual's perception of whether people important to the individual think the behavior should be performed.
- Behavioral control is defined as one's perception of the difficulty of performing a behavior. TPB views the control that people have over their behavior as lying on a continuum from behaviors that are easily performed to those requiring considerable effort, resources, etc.
- Although Ajzen has suggested that the link between behavior and behavioral control outlined in the model should be between behavior and actual behavioral control rather than perceived behavioral control, the difficulty of assessing actual control has led to the use of perceived control as a proxy. Eagly & Chaiken(1993)

C. Technology Acceptance Model

User acceptance of technology has been studied repeatedly over the decades from various perspectives. The more important technology becomes as a part of our daily lives, the more companies expect their customers, suppliers and employees to be willing and able to utilize technology in various ways.

Theory of Reasoned Action (TRA), Theory of Planned Behavior (TPB) and Technology Acceptance Model (TAM) are probably the most used theories for modeling user adoption of new technology. TRA and TPB are mostly used in the studies of social psychology to study the behaviour of people. Researchers of system usage and information technology adoption have also extensively adopted them. TRA is in fact the ancestor of both TPB and TAM.

Technology Acceptance Model (TAM) is an information systems theory, which is adapted from TRA. It is widely used for the purpose of predicting, explaining and enhancing common understanding of user acceptance of information technology in various areas. This research uses the findings based on TAM as the basis for the theoretical model. Also because TAM has been used in many similar studies earlier. Several extensions of TAM have been proposed and empirically validated also in studies conducted in the area of E-banking.

Technology Acceptance Model (TAM) was initially suggested by Fred Davis 1989. It is one of the most studied and used models in the investigations of user acceptance of information technology. The model is adapted from Theory of Reasoned Action (TRA), which was originally proposed by Fishbein and Ajzen in 1975. Technology Acceptance Model is an information system theory, which purpose is simply to predict and explain the user acceptance of information technology. The model addresses the reasons why users either accept or reject particular piece of information technology. The revised model by Davis et al. (1989) is constructed from external variables (external stimulus), perceived usefulness and perceived ease of use (cognitive response), behavioral intention, and actual usage (behaviour). (Davis et al. 1996)

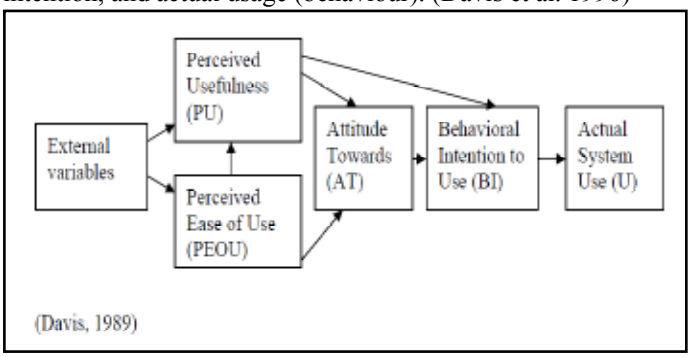

Fig. 2: Original Technology Acceptance Model

Above figure is a description of the original TAM by Davis. The fundamental idea of the theory is that perceived usefulness and perceived ease of use influence the users' intention to use information technology either directly or mediating via attitude towards the behaviour, leading to actual usage of the system. Attitude Towards (AT) and Behavioural Intention (BI) are common with the Theory of Reasoned Action. Perceived ease of use (PEOU) has a strong influence on AT through perceived usefulness, but also directly. Perceived Usefulness (PU) has a strong direct influence via both AT and BI.

PU was defined as "the degree to which a person believes that using a particular system would enhance his or hers job performance". "A system high in perceived usefulness, in turn, is one for which a user believes in the existence of a positive use-performance relationship". PEOU was described as "the degree to which a person believes that using a particular system would be free from effort". (Davis, 1989). The original TAM was revised by leaving attitude from the model, as empirical validation proved that intention to use is only partly mediated by attitude (Davis and Venkatesh, 1996).

The process of modeling PEOU and PU as distinct constructs allows researchers to better trace influences of all of the affecting factors on information systems acceptance (Davis, 1989; Pikkarainen, et al., 2004). The greater the perceived usefulness and the perceived ease of use, the better are people's reactions towards the innovation and the higher their intention to adopt it (Hernandez & Mazzon, 2007). According to TAM, perceived usefulness (PU) and perceived ease of use (PEOU) pressure an individual's behavioral intention to use a system, which determines actual use (Schaupp & Carter, 2005).

The technology acceptance model (TAM) was one of a number of studies that have helped in providing theoretical frameworks for research in the adoption of information technology and information systems over the last two decades. TAM has been used extensively as the basis of a range of empirical studies. As a result of several applications and replications it is believed that TAM is one of the most well-established, robust, parsimonious, and influential in explaining IT/IS adoption behaviour and consistently explains a substantial proportion of the variance in usage intentions and behaviour (Lu et al.,2003; Lymperopoulos & Chaniotakis, 2005; McKechnie et al., 2006).

III. Research Model & Hypotheses

A. Research Model

In this study we amalgamate TAM and TPB framework that will prepare an inclusive model in order to examine the consumers' intentions towards, and adoption of, E-banking. There are 6 constructs in our model, which includes perceived ease of use, subjective norm, and perceived behavioral control as independent variables, perceived usefulness, and attitude as intervening variables, and intention to use as the dependent variable. We will test the strength of the hypothesized relationships embedded in the theoretical model and the robustness of the model in predicting customers' intention to adopt E-banking. The theoretical model is graphically presented in fig. 3.

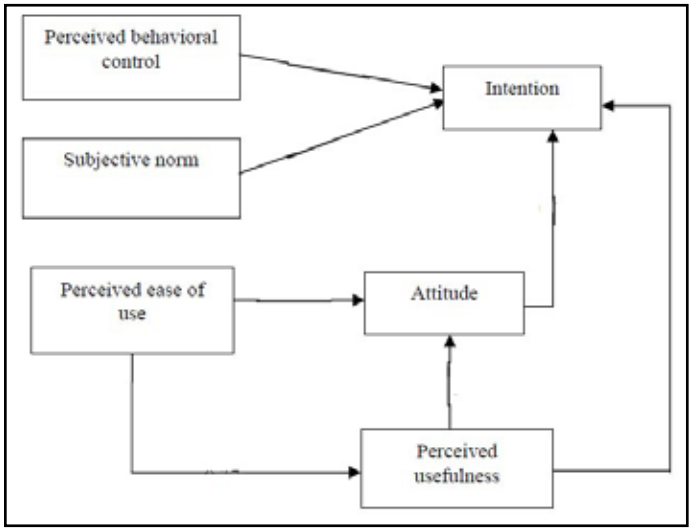

Fig. 3: Proposed Theoretical Model

Based on the theoretical model developed, this study proposes the following hypotheses with regard to the adoption of E-banking.

B. Hypotheses

1. Perceived Ease of Use

Hypothesis 1. Perceived ease of use positively associated with

attitudes towards the use of E-banking.
Hypothesis 2. Perceived ease of use positively associated with perceived usefulness of E-banking.

2. Perceived Usefulness

Hypothesis 3. Perceived usefulness positively associated with behavioral intention to use E-banking.
Hypothesis 4. Perceived usefulness positively associated with attitudes towards the use of E-banking.

3. Attitude

Hypothesis 5. Attitude positively associated with behavioral intention to use E-banking.

4. Subjective norm (SN)

Hypothesis 6. Subjective norm positively associated with behavioral intention to use E-banking.
3.2.5 Perceived behavioral control (PBC)
Hypothesis 7. Perceived behavior control positively associated with behavioral intention to use E-banking

Hypotheses and their supporting studies are summarized in Table 1.

Table 1: Summary of Hypotheses Tests

Hypothesis	Path	Support
H1	PEOU → Attitude	Yes
H2	PEOU → PU	Yes
H3	PU → Intention	Yes
H4	PU → Attitude	Yes
H5	Attitude → Intention	Yes
H6	Subjective norm→ Intention	Yes
H7	Perceived behavioral control→ Intention	Yes

IV. Research Methodology

A. Scope of the Study

The study focuses on customers who use internet for banking purposes, using this information and by cooperating with Indian banks, the researcher was able to identify the sampling frame from which the data was drawn. For a sample to be representative it should summarize all relevant information about the parent population contained in the sample. Participants in the survey were asked a number of demographic questions to establish representativeness by comparing the sample with the whole population of Indian users of E-banking.

B. Survey Instrument

A questionnaire was used as the research survey instrument; it comprised a series of statements reflecting the items operationalizing the constructs of the study. The questionnaire is divided into two sections. The first section consists of questions to collect respondent's demographic profile. The second section solicited responses about the variables of interest in this study: perceived usefulness, perceived ease of use, attitude, subjective norm, perceived behavioral control and intention to use. All statements were measured on a five-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The questionnaire was pretested and revealed no problems. Regarding reliability, the survey had internal consistency with all multiple-item constructs achieving Cronbach's alpha of 0.80 or higher.

C. Data Collection

A covering letter explaining the purpose of the study, together with a copy of the questionnaire, was sent to the concerned persons. To encourage participation in the study, respondents were promised that they would receive a summary of the research findings soon after the completion of fieldwork. Three weeks after the questionnaires were dispatched, a reminder letter, accompanied by an extra copy of the questionnaire, was sent to those firms that had not responded. The entire fieldwork process lasted for approximately one month, resulting in 140 returned adequately completed questionnaires.

D. Sample Profile

Half of participant firms were concentrated in the tricity region(Chandigarh, mohali and panchkula). The rest of the sample was distributed into the two major cities i.e. Patiala and Ludhiana. Majority of the respondents includes Govt. sector employees, IT companies, private sector employees. The data is collected by distributing questionnaires to different customers. Participants in the study were composed of 62.6% male and 37.4% female. Majority of the respondents were between 27 and 38 years old, which was 41.8% of the total respondents. When the survey was conducted, 72.4% of participants had medium computer usage skill.81.1% of the respondents had medium or easy access to internet and 68.2% of the respondent had medium Internet usage skill while 80.6% had used the Internet for more than 7 hours in each week.

E. Statistical Method

To test the proposed conceptual model, the technique of structural equation modeling (SEM) was employed. The first step presents the results of the full hypothesised model developed for this research. The model is assessed for goodness of fit before the full hypothesized model was tested (Anderson & Gerbing, 1988). Some common fit indices reported in structural equation modeling are designed to identify model goodness-of-fit. Common criteria for SEM have been previously suggested and the results are presented in Table 2. In these results, the structural model presented here indicates adequate fit with the observed data, compared with the suggested fit criteria.

Table 2: Results of the model goodness-of-fit

Fit index	Recommended criteria	Results in this study
Chi-square/Degree of freedom	<3	1.90
P value	>0.05	0.085
GFI (goodness-of-fit index)	>0.90	0.98
AGFI (adjusted goodness-of-fit index)	>0.90	0.095
CFI (comparative fit index)	>0.90	0.099
RMR (root mean squared residual)	<0.05	0.044
RMSEA (root mean squared error of approximation)	<0.05	0.039
NFI(Normative Fit Index)	>0.90	0.97

F. Hypotheses Testing

Fig. 4 presents results from the path analysis of the combined hypotheses. The first two hypotheses proposed that perceived ease of use would predict attitude toward the use of E-banking system (Hypothesis 1), and perceived usefulness of E-banking (Hypothesis 2), both with positive signs. The path for Hypothesis 1 was significant (β= 0.16, t = 5.98), either the path for Hypothesis 2 was significant (β= 0.29, t = 4.30). Thus, Hypothesis 1 and Hypothesis 2 were supported. The third and fourth Hypotheses proposed that perceived usefulness would be a positive predictor of intention (Hypothesis 3) and attitude toward the use of E-banking (Hypothesis 4). The path for Hypothesis 3, (β= 0.33, t = 3.01) and the path for Hypothesis 4, (β= 0.42, t = 2.41) were significant. Thus, Hypothesis 3 and Hypothesis 4 were supported. The fifth Hypotheses proposed that attitude toward the use of E-banking system would be a positive predictor of intention to use E-banking .The path for this Hypotheses was significant, (β= 0.29, t = 2.47). Therefore Hypothesis 5 was supported. The sixth Hypotheses proposed that subjective norms would be a positive predictor of intention to use E-banking (Hypothesis 6).The seventh Hypotheses proposed that perceived behavior control would be a positive predictor of intention (Hypothesis 7). The path for Hypothesis 6, (β= 0.31, t = 7.68) and the path for Hypothesis 7, (β= 0.29, t = 11.01) were significant. Thus, Hypothesis 6 and Hypothesis 7 were supported.

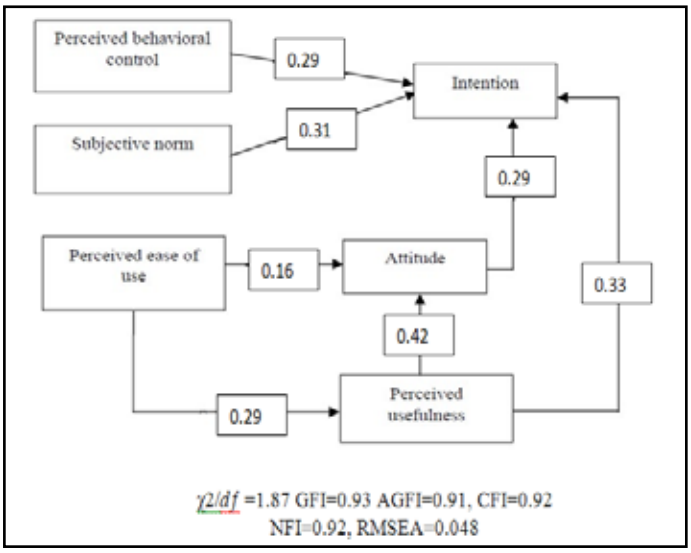

Fig. 4: Result of Structural Modeling Analysis

V. Discussion of Findings

The results of this study provide support for the research model presented in figure 1. Results shows that perceived behavioral control positively affects the intention to use E-banking and less affected by Perceived usefulness, subjective norms and attitude. Perceived usefulness appears to be the second determinant of a consumer's intention to adopt E-banking. Perceived usefulness is predicted mutually by perceived ease of use. Also perceived usefulness has an indirect influence, via attitude, on behavioral intention to use online banking. A study by Taylor and Todd (1995) indicated that perceived usefulness has both direct and indirect influences on behavioral intentions toward system use. Perceived ease of use affects the attitude and perceived usefulness but does not directly impact intention to use. Perceived usefulness was always an important determinant of attitude in TAM, and it may mediate the influence of perceived ease of use on attitude. Indeed, perceived ease of use has long been recognized as a basic requirement for system design. Subjective norms also have a significant impact intention to use E-banking. Attitude also has a significant impact intention to use E-banking. Moreover, attitude is predicted jointly by perceived usefulness, perceived ease of use.

VI. Conclusion

This study was conducted to identify determinants of user adoption of E-banking services among Indian citizens. The results show that the proposed model has good explanatory influence and confirms its strength in predicting customers' intentions to use such services and demonstrated that E-banking services acceptance can be explained in terms of perceived behavioral control, perceived usefulness, perceived ease of use, subjective norm and attitude. The framework used in this study is the integrated model of Theory of Planned Behavior and Technology Acceptance Model. The findings supported the hypotheses derived from the model as well as earlier empirical studies.

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