ATM’s adoption in developing countries: Déjà vu or not?

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Abstract
This paper proposes some thoughts on, and insights into, technology adoption in different cultural contexts, analysing the relationship between Hofstede’s cultural value dimensions and ATM’s adoption in urban India. It is based on an ethnographic study carried out in Mumbai in autumn 2002 combining field observations and structured interviews (N=43). The sample consisted of early ATM users, bank customers who have not chosen to use ATM’s, and first time users, or people who decided to try out an ATM for the first time as part of our research. Findings are analysed to identify specific cultural issues which are likely to affect the adoption of ATM’s in urban India and compare this process with existing knowledge of ATM adoption in western countries.

1. Introduction
ATM’s (Automated Teller Machines) are long standing, ubiquitous examples of walk-up-and-use computer-based technology in public environments. By 2002, there were over 27,000 ATM’s operated by banks in the UK – an increase of over 50% over the previous five years [5]. Every day, these machines have more than five million users, withdrawing over £300 million.

In many parts of the world, the majority of bank customers regularly use ATM’s and today’s youth have not known a world without them. In recent surveys in the USA, over 60% respondents said they were ATM’s users [1] and nearly 70% that using an ATM was the predominant reason for going to banks (Bank Marketing, 1997). To many South African children ATMs are more familiar than actual bank branches with tellers, hence the association ‘a bank is a place where you insert a card then money is released’ used by these children to explain the concept of banks [6].

Nowadays, many users do not realise that the ATM is a complex piece of computer-based technology. Rather they perceive these devices as very simple tools, providing the convenient and familiar functionality of basic financial information and dispensing cash [11, 8]. It has taken approximately 30 years and aggressive promotion by financial institutions to establish the success of ATM’s. Adoption has not been straightforward, requiring the development of trust in technology and willingness to modify behavioural strategies in a very sensitive domain, that of personal finance. Research has monitored this period, helping us to understand major drivers and inhibitors to widespread adoption.

This paper proposes some thoughts on, and insights into, technology adoption in developing countries. It is based on a literature review and findings of an ethnographic study to investigate ATM’s adoption in Mumbai. Hofstede’s research on cultural dimensions is used as a theoretical foundation. Hofstede [10] proposes five value dimensions, which have a significant impact on behaviour in all cultures and can be used to differentiate between different cultures. These dimensions are listed in Table 1 along with a brief description.
<table>
<thead>
<tr>
<th>Value dimensions</th>
<th>Description</th>
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<tbody>
<tr>
<td>Power distance</td>
<td>Extent to which the weaker members of a society accept inequality in power distribution.</td>
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<tr>
<td>Uncertainty avoidance</td>
<td>Extent to which a society feels uncomfortable with uncertainty and ambiguity.</td>
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<tr>
<td>Individualism/collectivism</td>
<td>Individualistic cultures expect individuals to look after themselves; collective cultures expect group members to support each other.</td>
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<tr>
<td>Masculinity/femininity</td>
<td>Masculinity stands for a society where gender roles are clearly distinct; femininity for a society where social gender roles overlap</td>
</tr>
<tr>
<td>Long/ short-term orientation</td>
<td>Long-term orientation encourages virtues oriented towards future rewards. Short-term encourages virtues related to present rewards</td>
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The paper is organised as follows. Section 2 provides a short review of research on technology adoption in general and ATM adoption in particular. Section 3 describes the study and presents the results; the final section provides our conclusion.

2. Technology adoption

Technology adoption and diffusion are two interrelated concepts. Adoption is the process by which an individual becomes committed to continued use of an innovation. It occurs at the micro level, being the individual’s decision process leading to adoption or rejection. Diffusion occurs at a macro level, being the process by which adoption spreads through a specific culture.

Since the mid-eighties, a relevant corpus of research has concentrated on identifying the conditions or factors that could facilitate IT adoption. A number of models have been proposed to predict system use and assess the market potential of emerging technology. A widely accepted and robust tool is the Technology Acceptance Model or TAM [7]. It was designed to understand the effect of external variables (e.g., interface design and training) on user acceptance of technology. TAM suggests that perceived ease of use and perceived usefulness are the two most important factors in explaining technology use. They directly affect the intention to use, which is the single best predictor of actual system usage. The role of attitude in this model is controversial. Some studies suggest that the impact of beliefs on intention is completely mediated by attitudes towards the behaviour, others exclude the attitude construct because it does not mediate the effect of perceived usefulness on intention. This discrepancy can be explained by differences in the context where technology is used. In a work environment, one can use a technology despite a negative attitude because it is useful; while in a personal context the role of attitude becomes more relevant.

Similarly, the type of technology affects behavioural predictors of use [12]. An extension of the TAM model has been proposed to explain acceptance and usage of ATM’s [13]. Two specific factors were found to complement the influence of perceived ease of use and usefulness on ATM’s usage in Britain. These factors are perceived level of privacy and personal space. TAM has been repeatedly tested in many different environments but mainly in western societies, those who have witnessed the extraordinary establishment of personal and public technology over the last 20 years. Empirical studies have demonstrated that TAM does not hold equally well across cultures [18]. In particular, the model explained e-mail adoption in the US and Switzerland but not in Japan, where cultural tendencies towards greater
power distance, higher uncertainty avoidance and a collectivist orientation tend to
dissociate usefulness from use.

2.1 ATM adoption
Several studies have monitored ATM adoption over the last 30 years. In the early
80s, a survey study indicated that location convenience was the most important
factor to predict propensity of using ATM’s [16]. This factor became less important
as ATM diffusion increased. Age is generally considered the most important
personal factor to predict ATM’s adoption. Usage of ATM’s by elderly has never
been as high as within other age groups [2, 11, 15, 16]. This finding has been
associated with the general resistance towards technology typical of elderly people
and to specific difficulties in learning and using new technologies [9, 15]. Specific
training programs and design solution have been proposed to lessen this problem.

Other principal reasons for non-use are listed and explained below. The order reflects
their relative importance. This short review is based on two US samples, one
Australian sample, and one UK sample [2, 11, 15, 16]. The similarity between these
samples is great.

- **Lack of need** - feeling of being organised enough not to require banking services
  out of hours, not giving enough importance to saving time, and no opportunity
due to the lack of personal earnings.
- **Safety concerns** - physical safety (fear of robbery) and control of transaction
  (concern over card security and ATM malfunctioning, fear of spending too
  much).
- **Preference for human contact** - inclination for dealing with people rather than
  machines and a general dislike towards technology, resulting in less technology
  use. This reason is particularly important for elderly people.
- **Feeling of inadequacy** - fear of not been able to use the ATM. This is also
  aggravated by the fear of appearing foolish in public as a result of failing to use
  the machine. This reason is particularly important for elderly people.

Another reason for not using ATMs is due to accessibility restrictions (wheelchair
users, blind or partially sighted people and people with reduced upper-limb strength
and mobility encounter several difficulties operating ATMs). Recent legislation and
standards are likely to alleviate this problem, forcing ATM manufacturers and
deployer to create technology which is usable by all people, regardless of abilities.

3. ATM in India
ATMs were first introduced to India in 1988 in a few foreign banks. By 2001 there
were only 5,000 machines [14]. They are still a novelty, advertised on street panels,
leaflets, press and web-sites. The first ATM installed this year in Tiruvanamallai, a
village in the Tamil Nadu district, was greeted by an impressive inauguration
ceremony. Photographs of the machine adorned with flower garlands appeared on
the front page of several local newspapers (Dinamalar, 20-06-2002.)

To throw some light on this new context, an ethnographic study was conducted in
Mumbai, during autumn 2002. A variety of bank branches and ATM installations
were monitored. Observers recorded physical movements (queuing and actions) and
social interactions (small talk and task based conversation) throughout the financial
transaction. Structured interviews were also carried out. They addressed people’s
everyday financial management, general expertise with technology, exposure to and attitudes towards ATM’s, concerns and expectations. The study involved a total of 43 people. Users (N=20) were invited to describe their learning period, reporting on the reasons behind using an ATM and on behavioural modification due to increase in expertise. Non-users (N=23) reported on their opinions of ATM’s and reasons for not using them. Some of them (N=7) were also invited to try out an ATM in a controlled environment.

The huge amount of information gathered during this study was consolidated into a coherent description of ATM usage in Mumbai applying different tools and methods (affinity diagram, content analysis, design stereotype extraction, and interactive workshops with different subject-matter experts). Principal deterrents of ATM adoption are discussed in the following sections. The order reflects their relative importance.

3.1 Feeling of inadequacy – ATM’s are status symbol
The general perception of ATM’s among both users and non-users in India is that of a technological device for rich, educated people, living a busy life, rather than as a commodity for everybody. In a high power-distance society such as India this perception is critical, because it strongly affects people’s beliefs about their self-efficacy and thus their likelihood to adopt the technology. Non-users perceived ATM’s as alien technology, something, which could not fit into their life-style. Most of them told us ‘ATM is not for me’ either because it was considered to be ‘for richer people’, for ‘people with a better education’, or for ‘younger people’. Among users, attitudes towards ATM’s are very positive, reflecting both the status symbol and what is perceived as a more ‘progressive approach to life’.

The status symbol association has been created and kept alive by many factors. The banking system in India reflects the hierarchical structure of society and ATM’s were first introduced by banks serving upper class customers. ATM’s were thus designed to attract this specific audience. They are normally enclosed in large air-conditioned kiosks and protected by a 24-hour security guard. These locations are likely to appeal to the higher-class segment of the population but tend to discourage potential users from lower classes.

3.2 Preference for human contact – ATM’s are technology
ATM’s are perceived as technology, requiring education and skills to be used. In India, this perception is intrinsically associated with that of status symbol and with the western world. Technology, by definition, is American. The colonial period has encouraged a notion of ‘superiority’ associated with western ideas, values and products, hence technology is highly desirable for urban upper classes. Learning to use an ATM is regarded as an important self-achievement eliciting a positive emotional reaction. However, the association of an ATM with technology is also a negative, reinforcing the perception of ATM’s as alien. ATMs do not even have a name in any Indian language and are referred to in English. The same applies to specific terms such as Personal Identification Number (PIN) and cash withdrawal.

3.3 Lack of need – friends in need are friends indeed
India is a collective cash-based society. People are used to keeping emergency money at home and to carrying substantial amounts of money when travelling. This
money is intended to provide for the emergency needs of an entire household, as well as of relatives and friends. Borrowing between friends and relatives is very common. This cultural trait tends to inhibit the need for 24-hour cash machines, because everybody can rely on a consolidated social network to borrow cash from. The collective orientation of society also affected the way people use ATM’s. We found several instances of people sharing their card with friends and family, or deciding to adopt ATM’s to facilitate money transfer between group members in different geographical locations (different cards accessing the same account).

### 3.4 Lack of need – saving time is not priority

For many people in India saving time is not a major concern, hence it will not be a major driver to ATM adoption. For most middle and lower class Indians, queuing at a bank is perceived as a normal part of finance management. On average, people reported waiting around half an hour, ranging from 5 minutes to one hour. Nevertheless, only a few non-ATM users belonging to the upper classes explicitly complained about it. Among others a fatalist attitude was prevalent. Queues were perceived as a routine, which may even have some benefits, such as socialising.

### 3.5 Safety concerns – who will believe me?

The security of Indian ATMs is high, being protected by walls and guards. A few people referred to fear of being robbed as a deterrent to ATM use, but most of the concerns regarded machine malfunctioning, and inability to recover from errors. In particular people were afraid of being considered responsible for ATM errors and not being believed by bank staff.

### 4. Discussion

The underlying inhibitors to ATM adoption in India are not intrinsically different from the ones determined more than a decade ago in some western countries. They can be traced back to a few main factors, such as feelings of inadequacy, preference for human contact, lack of need and safety concerns. People tend to use ATM’s if they have a need for it, if they perceive the ATM to be easy to use, if they feel safe, and if they have a positive attitude towards technology in general. However, these reasons appear to be caused by very different factors in the different contexts due to different cultural values (Table 2).

<table>
<thead>
<tr>
<th>Country</th>
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<th>Masculinity femininity</th>
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</tr>
</thead>
<tbody>
<tr>
<td>India</td>
<td>77 (10-11)</td>
<td>40 (45)</td>
<td>48 (21)</td>
<td>56 (20-21)</td>
<td>61 (7)</td>
</tr>
<tr>
<td>UK</td>
<td>35 (42-44)</td>
<td>35 (47-48)</td>
<td>89 (3)</td>
<td>66 (9-10)</td>
<td>25 (28-29)</td>
</tr>
<tr>
<td>US</td>
<td>40 (38)</td>
<td>46 (43)</td>
<td>91 (1)</td>
<td>62 (15)</td>
<td>29 (27)</td>
</tr>
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</table>

In India the feeling of inadequacy is not only a personal belief about lack of technology skills, rather it is the result of a strong value dimension expecting different access to resources as a function of people’s social status. In the same way, the lack of a need is increased by cultural values towards a collective society, where supporting other people is seen as a great virtue. The long-term orientation of the
Indian tends to explain why people do not mind queuing to access basic financial services.

As a general conclusion, we believe that a model accounting for technology adoption in India should include a strong normative component to supplement the effect of attitude on intention. Subjective norms relate to the view of other people and to the motivation to comply with their views. This proposal is consistent with the Theory of Reasoned Action TRA [3] but not with TAM, where subjective norm and sometimes even attitudes are considered redundant. Both TAM and TRA assume that individuals are rational and consider the implications of their actions before deciding to engage or not in a given behaviour (e.g., adopt a piece of technology). The difference is in the information used to inform that decision. TAM assumes that technology adoption is an opportunistic individual decision determined by a balance between perceived gain (usefulness) and costs (ease of use). This is not enough to predict adoption in India, where social influences on individual behaviour are much stronger.

References