

Understanding buyer and seller behaviour for improved payment product development

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Received (in revised form): 8th February, 2007

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ABSTRACT

Every payment professional has tried this at least once: a full segmentation of payment solutions. One often sees arbitrarily chosen dual segmentations based on the properties of the different payment solutions. Examples are online vs offline, prepaid vs postpaid, guaranteed vs non-guaranteed, micro vs macro amount and business vs consumer payments. Such segmentations may provide a clearer view on what the world of payments has to offer, but they fail to provide insight into the key drivers of transactions: the behaviour of buyers and sellers. A better understanding of their behaviour provides the direction for optimising the use of existing payment services, improving existing services and developing new payment services. This paper introduces the concept of 'transaction contexts' in order to understand key determinants for the transactional be-

haviour of buyers and sellers, thus providing an all-encompassing framework for payment product development and management. This framework is applied to some practical examples.

Keywords: payment, product development, transaction, context behaviour, risk, merchant, consumer, channel, on-line, segmentation, framework

THE THREE PROCESSES IN A TRANSACTION

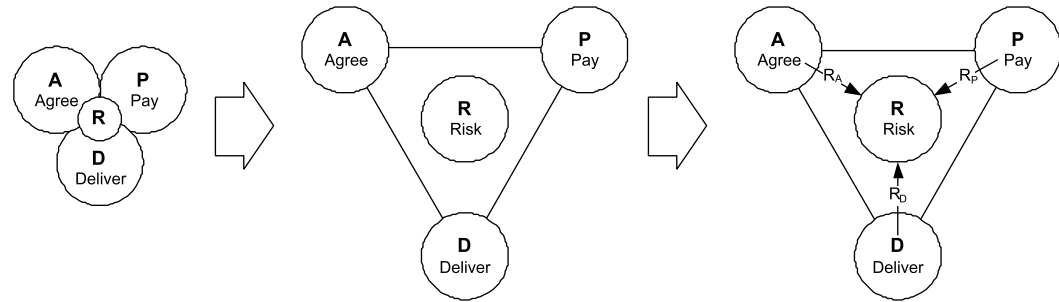
First, a simplified generic model of a transaction is introduced (Figure 1). A successful transaction typically consists of two actors (buyer and seller) and three processes:

- **Agreement (A).** Buyer and seller agree on some form of transaction, at a minimum determining the product or service and its price.
- **Payment (P).** Buyer and seller agree on a payment solution.
- **Delivery (D).** Buyer and seller agree on a delivery solution.

A transaction always starts with an Agreement. Payment and Delivery follow to complete it. When these three processes are executed at one time, in one place,



Figure 1 Three processes of a transaction: Agreement, Payment, Delivery affecting the Risk perceived



the Risk at the heart of any transaction is shared equally between buyer and seller: the Risk is balanced. This has been the case since the invention of commerce.

The dynamics of transactions changed, however, with the introduction of new channels such as the Internet and (mobile) telephone which serve as both communication *and* delivery channels. The transaction processes (A, P and D) are disconnected in time and place, allowing for changes in the order of the processes and resulting in unbalanced risks for the buyers and sellers involved. As a result, multiple payment and delivery methods were developed over time.

This disconnection of the processes changes the constitution of the Risk perceived in the transaction. The Risk components resulting from Agreement (R_A), Payment (R_P) and Delivery (R_D) are now separate components, all affecting the total Risk perceived in the transaction: $R = f(R_A, R_P, R_D)$. In practice, however, Payment and Delivery solutions are often coupled.

RISK PERCEIVED IN A CONTEXT

The 'transaction context' is the total of situational circumstances in which each of the three processes of the transaction take place. The transaction context directly influences the Risk either actor perceives. From analysis and practical experience, it was found that four generic factors con-

stitute the transaction context, which in effect determine the Risk perceived in a transaction:

- (i) *Timing (t): the timeline and order in which the processes are executed.* Processes can be executed simultaneously or disconnected. In the latter case, the order of Payment and Delivery can be swapped. This leads to three generic types of timings (Figure 2).
- (ii) *Location (l): the location of a transaction process, physical or virtual.* Location can also be related to the geographical distance between the buyer and seller. Examples of physical locations are shops, markets and vending machines. Virtual locations refer to 'channels', such as Internet, e-mail, (mobile) telephone, SMS. Virtual and/or distanced locations of the actors transacting typically increase the Risk perceived.
- (iii) *Relation (r): the relation between buyer and seller.* Three types are distinguished: anonymous, known and trusted. The type of relation influences the perceived risk for both parties. This context factor is a dynamic one: over time, the relation between buyer and seller changes, changing also the Risk perceived. Repetitive transactions (eg subscriptions, rent) typically lead to a higher degree of trust than do incidental

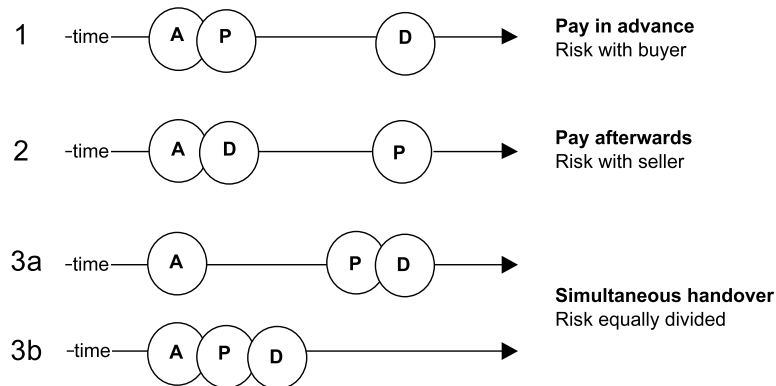


Figure 2 Different timing and order of transaction processes

transactions. With low trust, parties will seek more guarantees during the transaction process.

- (iv) *Product (p): the characteristics of the product delivered.* Core characteristics are the value (high/low) and substance (virtual/physical). In particular, the value of the product strongly determines Risk perceived by both actors. High-value products require more guarantees than do low-value products. Also, the nature of the product influences the risk, eg small high-value electronic products are an attractive target for fraud. The substance of the product directly relates to the delivery channel. In the case of electronic/digital products, these can be delivered through electronic channels. Physical products obviously cannot.

RISK IS PERCEPTION

The Risk perceived is different for buyer and seller: generally opposite, but not by definition. In addition, the Risk perceived in a context is different for each individual actor, as each person experiences and weighs risks differently: $R_x = f(r_t, r_l, r_r, r_p)$ where x can be A, P or D.

Risk can be defined as the product of

probability (p) that an event occurs and of its consequence (c): $r = p \times c$. Looking at the factors that determine the Risk perceived in the Transaction Context Model, the factor Timing (pay in advance vs pay afterwards) is crucial for the default risk balance between buyer and seller. The factor Relation relates to *probability* and Product relates to *consequence* (through its value). The factor Location determines risk to a lesser extent, but there are certain correlations between channels and combinations of relation and product. For example, the Internet correlates strongly with anonymous relations and virtual products, but there is no one-to-one relationship.

TRANSACTION CONTEXT MODEL

The whole of the transaction process and the factors influencing the Risk perceived in the transaction are called the 'Transaction Context Model' (Figure 3).

In summary, this transaction model says that the total risk of a transaction is a function of the separate risks of the three components of a transaction: agreement (A), payment (P) and delivery (D). The risk of a separate transaction component (A, P or D) is determined by the risk associated with the four situational fac-

Figure 3 The Transaction Context Model

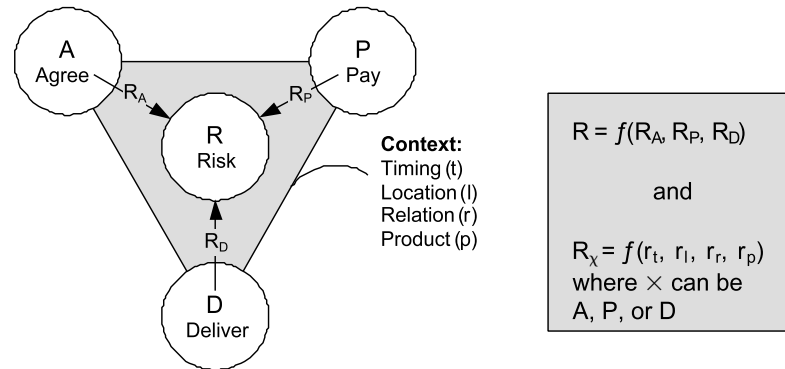
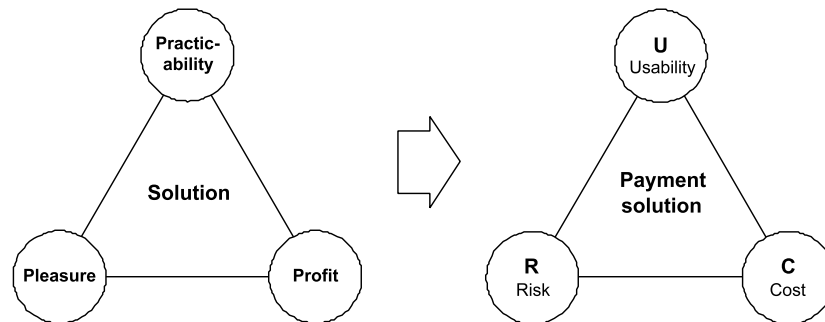


Figure 4 Criteria that affect use of a Payment solution: Usability, Cost, Risk



tors: timing (*t*), location (*l*), relation (*r*) and product (*p*). Buyers and sellers perceive risk differently and therefore act differently in taking decisions with regard to payment and delivery methods.

RISK AS DETERMINING FACTOR FOR BEHAVIOUR IN A TRANSACTION PROCESS

To a large extent, situational circumstances drive the way one behaves and makes choices. As explained above, Risk is essential but there are more circumstances which play a role during a transaction.

In 1993, Prof. Dr Betty Collis, a behavioural scientist in the Netherlands, introduced the ‘3P Model’ (Practicability, Profit, Pleasure) to determine how an actor relates a (web) environment or (web) service to his/her own motives,

emotions and experience. This also applies to how actors behave during transactions and the choices that they make. When looking specifically at payment services, however, these criteria need to be translated to match the characteristics of payment services:

- Usability (= Practicability): what is the (desired) usability for the user (eg interaction, speed)?
- (Minimal) Cost (= Profit): what is the advantage for the user?
- (Minimal) Risk (= Pleasure): what drives recurring use?

Therefore, a certain choice of payment solution is an optimisation of Risk (R), Cost (C) and Usability (U) for both the seller and buyer.

In general, one can say that payment

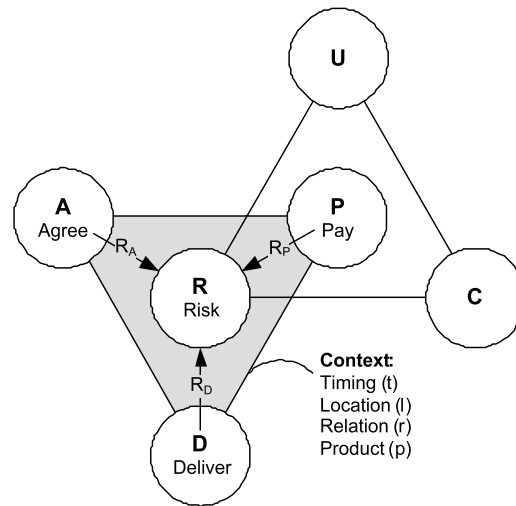


Figure 5
Framework: the 3P
Model applied to
the Transaction
Context Model

solutions with low risk come at higher costs than non-guaranteed payment solutions and may require more complex interaction for both buyer and seller. Still, cost and usability considerations for buyer and seller are secondary to the risk assessment of the transaction, making (perceived) Risk the determining factor for the use of payment solutions.

CREATING THE FRAMEWORK FOR PRODUCT DEVELOPMENT AND MANAGEMENT

Applying the 3P Model to the Transaction Context Model provides a framework that shows how the behaviour of the actors is affected: a balancing act occurs, and both buyer and seller seek optimal risk exposure in relation to cost and usability. It is this framework that one can use to assess payment solutions in particular contexts (Figure 5).

Basically the following happens:

- The seller perceives a Risk as result of the Agreement, based primarily on Location, Relation and Product. The seller also has to take into account

the Risk of losing the transaction altogether, when no acceptable Payment and Delivery solutions are offered to the buyer.

- This results in Payment/Delivery solutions with specific Timing to minimise the Risk for the seller who now offers the Payment solutions to the buyer.
- The buyer perceives a Risk as a result of the Payment/Delivery solutions offered by the seller and selects the Payment and Delivery solution with his optimal balance between Risk, Usability and Cost.
- When a transaction happens (ie payment and delivery occur) then both buyer and seller have agreed a mutually accepted balance for risk, cost and usability.

PUTTING THE FRAMEWORK TO USE: EXAMPLES OF TRANSACTION CONTEXTS

The proof of the pudding is in the eating, so this framework will be used for assessing payment solutions.

First some typical examples for business-to-consumer (B2C) contexts are in-

Table 1: Some examples of B2C transaction contexts

<i>Example No.</i>	<i>Context example</i>	<i>Detailed description</i>
1	Online purchase of a design clock	The location of the transaction is Internet. The relation is known: one can only buy after registering. Timing is before (pay before delivery). The product is physical and has a high value of €199.00.
2	Purchase of a CD in a shop	The location is the shop. The timing is simultaneous. The relation is irrelevant. Typical value is €17.50.
3	Parking with a mobile phone	The location is the mobile phone channel through which the buyer keys in the parking details. The relation is known and the value is moderate (eg €5.00). Timing is pay afterwards.
4	TV voting by SMS	The location is the TV channel (agreement) and mobile/SMS channel (payment). The relation is anonymous and the value is low (€0.75). Timing is pay in advance.
5	Pizza order via telephone	The channel is telephone. The product is physical and the relation is trusted when it is a regular customer. The value is moderate (€18.50). Timing is simultaneous.

Table 2: Behavioural criteria for scoring

<i>Behavioural criteria</i>	<i>Description</i>
R_b : Risk of the buyer	Can the buyer reverse the transaction? How well secured is the solution?
R_s : Risk of the seller	Can the seller reverse the transaction?
C_b : Cost to the buyer	This differs per country. In this paper, it is assumed that this cost is part of the banking arrangement a buyer has.
C_s : Cost to the seller	The basic transaction costs are a cost component, but also the additional back-office cost a seller has to make (eg in fraud management, reconciliation) in order to use such a payment solution.
U_b : usability for the buyer	Is the payment solution easy to use? Does the buyer need to authorise? Does he need to sign up?
U_s : usability for the seller	Can the seller use the solution easily? Is the process (STP) automated?

roduced (Table 1). The framework also applies to business-to-business contexts. In principle, the list of contexts is endless.

The framework has been applied to the context examples of Table 1 by setting off payment solutions against the behavioural criteria in Table 2. The payment solutions per example have been limited to a few commonly used, just for illustration purposes.

The payment solutions are scored per context to see how context and behavioural factors can differ. The behavioural criteria are scored with ++, +, 0, -, --. For Risk, a higher score means lower Risk. For Cost a higher score means lower Cost.

Example 1 (Table 3) clearly shows the variation in behavioural criteria. Looking at Risk, one sees the difference between

Table 3: Example 1 — Online purchase of a design clock

	R_b	R_s	C_b	C_s	U_b	U_s
Bank transfer	--	++	+	++	--	--
Realtime bank transfer	--	++	+	+	++	++
Credit card	+	--	+	--	++	+
Direct debit	++	--	+	++	++	++

Table 4: Example 2 — Purchase of a CD in a shop

	R_b	R_s	C_b	C_s	U_b	U_s
Cash	+	-	+	-	+	-
Debit card	++	++	+	++	++	++
Credit card	++	++	-	--	++	++
Cheque	+	-	-	--	-	--

the guaranteed payment solutions (bank transfer) and non-guaranteed solutions (credit cards and direct debit). In terms of Cost, one sees a favourable situation for the buyer, but even more for the seller, except for credit card, which is regarded as an expensive solution. Usability makes manual bank transfers stand out negatively; all other solutions have a good usability for both seller and buyer.

In the physical retail world cash is still the dominant payment solution. The analysis of Example 2 (Table 4) shows that cash is more favourable for buyers than for sellers. Sellers experience Risk (theft, loss), relatively high cost (mostly hidden costs) and a lower Usability due to the physical handling which is required. Cheques are the least preferred option but still applied in certain markets. Cards have a good score, with debit cards standing out on all aspects.

Example 3 (Table 5) shows a particular context in which the mobile phone is used for identification and authorisation. The actual payment is done afterwards via direct debit and credit card. Both payment solu-

tions mean Risk for sellers (because of charge-back risk), but this is the most practical option. The Risk is mitigated through the sign-up to the payment service, where the relation between buyer and seller becomes known. Another (less practical) solution could be reverse-billed SMS, but this is not used, most probably as a result of high costs for the seller and the limited usability for the buyer. It is very difficult to estimate the amount due for parking in advance. On top of that, amounts for SMS are limited.

No physical delivery takes place in the context in Example 4 (Table 6). Reverse-billed SMS is the only serious option because of the high penetration of this payment solution. There is a very low threshold for buyers to use it. The costs are high but that is taken for granted by the sellers (TV stations), because of the lack of usable alternatives. This analysis unveils that there is most probably a business opportunity for alternative payment solutions.

In Example 5 (Table 7), the order is placed by telephone, but the delivery and

Table 5: Example 3 — Parking with a mobile phone

	R_b	R_s	C_b	C_s	U_b	U_s
Direct debit	++	--	+	++	++	++
Credit card	+	--	+	++	++	+
Reverse billed SMS	-	++	--	-	-	+

Table 6: Example 4 — TV voting with SMS

	R_b	R_s	C_b	C_s	U_b	U_s
Reverse billed SMS	-	++	--	--	++	+

Table 7: Example 5 — Pizza order via telephone

	R_b	R_s	C_b	C_s	U_b	U_s
Cash	+	-	+	-	+	-
Debit card	++	++	+	-	++	++
Credit card	++	++	-	--	++	++
Cheque	+	-	-	--	-	--

payment are physical at the doorstep. Cash is again the most commonly used solution, but cards are also gaining momentum. Costs are high because there is a mobile terminal involved, which is not the case in regular physical retail. An alternative could be that the buyer gives his card number via telephone at the moment of ordering, but that is only possible (from a Risk perspective) when the relation is known or trusted. This is often not the case with telephone orders.

CONCLUSIONS

Application of the Transaction Context Model and the 3P Model to this limited set of contexts leads to the following observations:

- Risk is the bridging factor between the Transaction Context Model and the 3P

Model. Risk is the key determinant for transactional behaviour.

- Different contexts have different risk profiles, different cost and usability experiences and therefore different optimal payment solutions, for both buyers and sellers. The final choice of payment solutions is not only based on Risk criteria, but also on Cost and Usability criteria.
- A good understanding of contexts and behavioural criteria gives direction for optimisation, improvement and development of new payment solutions.
- Payment segmentation is achievable within a specific context. A generic segmentation irrespective of context is (still) not possible.

Really know your customer. Within a commoditising market, the challenge for all players is to maximise 'stickiness' with

their target groups. That can only be achieved when consumer and business financial logistics are fully understood. The Transaction Context Model helps to optimise further the cross-national and cross-cultural connections between buyers and sellers. This improved understanding

can unveil new approaches to the improvement of current practices and the identification of new (payment) service opportunities. So know your customers, especially when they transact.

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