

EMERGING FINANCIAL SERVICES TECHNOLOGY: NEW LEGAL ISSUES

Legal and Market Implications of Electronic Cash

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TRANSCRIPT

I get to speak to you this morning about something which we are all very familiar with and that is cash. I will do a lot of talking about cash and I will actually try to steer everyone away from thinking about electronic cash as something to do with a card. You will see in my talk – electronic cash happens to sit on a card, but please try not to think about this as a debit card or a credit card – just think about it as your wallet.

I want everyone to think a little bit more about cash – what we like about it, what we do not like about it, how we use it, how the banking industry deals with it, what sorts of laws are in place and regulations to deal with cash – and then I will explain the Mondex product and some of the implications from a legal and regulatory point of view. If we have time, I will talk about how things will get even more complicated in the future.

Often when I talk to people about cash, they say “Oh, I always use my credit card. I like the frequent flyer points” or “I always use my debit card”, and I always say to people “Do you carry a wallet, and what is in it?” and they will admit that they do carry some cash, even though they do not think they use it very often. If you do not believe that you use cash for the majority of your purchases, I encourage you to keep track for a couple of days. I think you will find that you are making a large number of purchases that you hardly even realise. Usually they are for small things – coffee, cigarettes, lunch, newspapers and so on.

So why has not cash already disappeared? I am someone who likes to collect frequent flyer points and I use my credit card as often as I can, yet I still carry cash. One of the reasons people like to carry cash is they know if they need to buy something, it is accepted. A credit card might not be accepted, a debit card might not be accepted. And from a seller's point of view you are getting value immediately for the sale. So if you are a merchant, you like knowing that you are getting value before the goods disappear.

Consumers often say they like the privacy of cash. They know that nobody is tracking what they are doing.

Certainly from the merchant's point of view, cards can be relatively expensive. One of the reasons you cannot buy a newspaper using a debit card or a credit card is because the merchant does not want to pay. In cases where consumers have to pay, consumers do not want to have to pay for the cost of that transaction. Credit and debit cards require on-line authorisation, which is an expensive transaction to process.

Cash is simple. Nobody needs any special telephone lines or swipe machines and so on. Another thing about cash is we can actually give it to other people. So you might joke sometimes whether someone will accept a credit card if you owe them money. Or if you are out for lunch with a group of friends, the bill comes, and you somehow have to share that bill, you are able to merge cash quite easily. And the other thing is we are all creatures of habit, and we do what we were brought up to do – pay with cash. So cash is pretty terrific – right?

Well, if you think a little bit more about cash, it has downsides too and is expensive to handle. If you think about the effort put in by merchants and by banks in distributing cash, collecting cash, counting cash, protecting cash, Australian banks spend about a billion dollars a year on cash handling. From a consumer point of view, one of the things that is not too great about cash is you actually have to make the effort to go and get it. You probably accept this today because that is what one has to do, so you make the trip to the ATM or perhaps to a bank branch. If you went back twenty years and you wanted cash, there was no ATM, you went into a bank branch and you really did not question that because as a consumer you did not have any other options. Well now we have ATM's, yet you still have to go and perhaps even queue up to get your cash.

Dollar notes are not quite as flexible as one might think on the surface. It comes in fixed denominations. As banks try to increase the productivity of their ATMs you will notice more and more often they put \$50 notes in them. I am sure you have experienced situations that I call "Mondex Moments" when cash is not all that convenient – where you have got your \$50 note and you are in the taxi and the taxi driver does not have the change, or you are on your way home from a good night out and all of a sudden you have to pay the babysitter and only have a \$50 note – all of those things. You cannot rip a \$50 note in half and give half of it for a \$25 payment.

Coins have been around for 2,000 years at least and we still need them when we are making certain purchases – parking meters, vending machines, public transport. However, often you actually have to have the right coins, so it is not even a matter of just having coins, you might have to have the right ones. So we all end up carrying around a pocket full of coins just in case we might need them.

Cash is very attractive to steal – again, because there is no tracking and it is something you can spend right away. Wouldn't it be good if you could better protect your cash?

Historically all currency runs the risk of counterfeit, and governments and police forces do a number of things in conjunction with financial institutions to protect against the risk of counterfeit. The reality is, most of the currency around the world is just printed on paper. Australia happens to have a higher degree of protection against counterfeit, but like everything in the world, these things have their limit and they can be broken.

People do not like to think about this too often, but certainly when we talk to people in the fast food industry, for example, they are very aware that money is extremely dirty – it is always passing from person to person in their hands – and the staff at a fast food establishment have to handle cash and handle the food. And quite obviously physical cash does not work on the Internet.

We are moving to an era of electronic commerce. Just like in the physical world there are all kinds of opportunities where one will want to make small purchases say to "buy" library information on the Internet and credit cards and debit cards will not be accepted for these small purchases.

No clearing system is required for cash. If you think about cash today – you take your money out of the ATM and what you do with it is your business, no one is tracking, the financial institution is not following that \$50 note until it comes back, and from an accounting point of view we do not

really know what goes on with cash outside the banks. One of the things that is recognised about cash today is, because it is being used generally for small purchases, any substitute payment mechanism would need to be very cost-effective. And I am back to my comment about credit and debit cards – people do not want to pay a 50 cent transaction fee in order to buy a 50 cent newspaper. So one needs to have a very cost-effective replacement for cash and that means one cannot afford the cost of collecting a whole lot of very small purchase transactions and exchanging them amongst financial institutions and accumulating them in an account that relates to an individual consumer.

When Mondex was first conceived, at the beginning of this decade the challenge was really to try to come up with something that would replace cash and have the characteristics of cash that we all like, but make some improvements over cash.

So here we have Mondex. What is it? It has got a computer chip right here on the card. This card is called a "smart card" because it has got that capability. This computer chip today only runs one program and that is electronic cash software. And what does that software do? It is very special software. It lets me keep my money on it and it lets me transfer money to another Mondex card. It does that, of course, in a very special way to protect against counterfeit, and from a consumer point of view it adds tremendous convenience over what we have today. With Mondex electronic cash you do not have to make the trip to the ATM. Electronic cash can travel over telephone lines. You can be at your PC at your office, you can be at home on the telephone, or you can actually be on the go with a mobile phone – and you can get your cash. So we go ahead ten years and you probably will not even need to ever visit an ATM, much like you may never need to visit a bank branch today.

Mondex is a product that was designed from the start to be a global product and there is recognition that electronic commerce is a global industry and so you will find the Mondex brand in more than fifty countries around the world. The Mondex electronic cash software lets one carry up to five different currencies. And again, think of it as your leather wallet. When you are about to go on a trip you often go and get currency for the countries that you are going to visit. So your Mondex card can actually keep up to five currencies at any point in time. Once you have finished with a particular country, you can empty the pocket in your wallet and put another currency in.

Very importantly, these transactions are not tracked centrally, and Mondex is unique relative to any other electronic cash product or stored value product. There is no centralised processing of the transactions, it makes it extremely cost-effective. I can also transfer money from person to person. In my house I am usually the one who gets the cash and then I share it around the family with my wife and my children. I think you will find that that probably happens in your own household. You need the ability to do that. Mondex works on the Internet. I have talked about withdrawal over a telephone line. The way Mondex works with the digital signatures and the encryption, it can travel over insecure channels.

I might just point out the level of security that is built into the Mondex product. Obviously this product needs to protect against counterfeit and often people say to me that surely a hacker will be able to fabricate value on their PC. That risk was recognised up-front. Mondex is a very sophisticated product and it is designed to be extremely resistant to counterfeit, although obviously anything in the world potentially can be ultimately broken. So there is a very sophisticated risk management system that works around Mondex to be able to identify the introduction of counterfeit and to actually address that counterfeit in terms of containing it. It also means that the Mondex smart card is a relatively expensive smart card. One smart card is not necessarily the same as another. Like computers that you might purchase, they came in all different shapes and sizes and prices. Mondex was designed to be highly resistant to fraud. Many of you would now have a smart card from Telstra for the pay phones that they just put out. It is a more inexpensive card – one that is suitable for payphone use but probably not for your money.

So that is the Mondex product itself. If you look at some of the structure around that, both operational and legal, again we start with cash. Take the model of cash. We have commercial banks who distribute cash to retailers and to consumers and take deposits, and consumers obviously can give money to others. But where do the notes and coins come from? They come

from the central bank. Commercial banks buy those notes and coins from the central bank and then they are able to distribute them.

Mondex works in exactly the same way. Electronic value can be withdrawn by consumers and merchants and deposited by consumers and merchants to commercial banks (we call them members in the Mondex world because they join to participate in Mondex). Instead of the central bank, we have what we call the originator. And that is the single source of value creation and value distribution. Again, just like the physical world, electronic dollars are minted in a highly secure location and then they are sold by the originator to individual financial institutions who can then distribute them out to consumers and merchants – again it is much like cash. Individual banks are not printing the notes that you get from the ATM. There is only a single source for that.

It means that there are fewer points of potential attack for counterfeit. Mondex has sophisticated technology and very secure locations in the fabrication of electronic cash.

I mentioned that Mondex is in fifty countries today. It was created in England and structured as a franchise. So franchises have been sold in more than fifty countries. In Australia we have this thing called Mondex Australia which I am running, which owns the franchise for Australia. The shareholders of my company are the four biggest banks, and they had the wisdom to recognise that if one is thinking about introducing an electronic currency, it certainly makes sense for banks to utilise the same currency. I think the last thing that any of us wants is to have to carry around a whole lot of different currencies and have to pay in some shops with one currency for certain goods and another currency in another. Merchants will not want the cost of dealing with multiple electronic currencies.

So they have chosen a common technology platform and a common electronic cash platform much like they do with physical notes today. They will compete like crazy in providing those services to consumers and merchants, but at least there is one common sort of currency.

Mondex is an open system. It is available to every financial institution in Australia to participate in Mondex, which means they can issue the electronic currency and redeem the electronic currency, and members will participate in the decisions about how Mondex operates within Australia through a Membership forum.

We have a separate company called the originator – back to the central bank look-alike – and every participating financial institution will be a shareholder in that body. It is through the shareholding that a couple of things happen. One is that all of the participants in Mondex back the electronic cash value and it is through this shareholding that that is effected. And it also means that they share in the float that is created. So for every electronic dollar that goes out into the market there is a dollar of consideration held centrally. So a pool of money is created centrally and that will generate some income and the participants in Mondex will all share in that on a fair share basis.

Hopefully that gives you enough of a background on the product and the structure for us to have a brief discussion about some of the potential implications. I am sure many of you have already thought through a number of things I have been speaking about this morning. We have our existing rules and laws that have been created in the domain of physical cash. And we have things like the EFT Code. It was written at a time when electronic cash did not exist. So things need to be thought of, and I suppose re-thought, such as the Code of Banking Practice, and Austrac and the rules in place to identify money laundering. The rules that have been established were established for how one deals with physical cash. Someone fronts up in a branch with more than \$10,000. We need to think about what do we do in the world of electronic cash.

I talked about multi-currency, I talked about Internet. With Mondex I can today transfer value to one of a couple of dozen states around the world where Mondex is operating already. You are really empowering individual consumers with the ability to make transactions anywhere in the world virtually in whatever currency they like.

There are some issues about who should be able to issue electronic cash and I talked about financial institutions, and potentially others will be able to participate in electronic cash. The only

real requirements are an ability to stand behind the value that is being issued and also to live by the rules that are required for risk management in terms of reporting and tracking value flows and so on. We potentially will have a broader group of participants than one might find in the banking industry or in the cash world today.

You think about multi-currency transactions, multi-country and whose transaction is it anyway? Obviously many of the issues that one faces generally with electronic commerce apply in the case of electronic cash. Many of them will be addressed on a broader basis but there are some unique issues, one of which is once the value is transferred, much like physical cash, there is no settlement afterwards. The value transfers immediately. So if I am purchasing something on the Internet with cash, it is cash, and once I have spent the money over the wire it is gone. So there is a need to build the right sorts of processes around that in terms of giving the comfort, the authentication that the two parties require, of who they are and so on.

Privacy: People often talk to me about privacy. They have heard that somehow smart cards are a way for banks or governments to invade your privacy. Well one of the tremendous things about Mondex is your individual purchase transactions are not processed centrally so it is much like cash whereby the transaction is really between you and the retailer. At the retailer's end, all the retailer is doing is accumulating electronic cash. They might take in say 500 transactions during the day, but at the end of the day they just have a total sum of electronic cash. And that is what they deposit to the bank; they do not deposit all of those 500 transactions.

Law enforcement and what sort of information could be provided: We have lots of discussions with various law enforcement agencies. Everyone wants to understand how this is going to impact the world that we have today. We obviously are not trying to facilitate criminal activity and so we do what we can to reduce the potential for that. On the other hand, we cannot with the introduction of a new product, solve all of the problems of the existing world.

Consumers: I mentioned guaranteeing the value on the card. Consumers are fearful of new technology and often when I talk to people about this they say: "What if there is counterfeit value? What if the system is cracked? What if I lose my card?" and so on. In terms of counterfeit, the guarantee provided by the participants in Mondex is that consumers and merchants will get the value on their cards. As a consumer perhaps with physical notes you hold up your note to the light and try to assess whether it is a counterfeit note or not – I do not know if people really could do that today, but in theory you need to protect yourself in today's cash world. However you can't hold a smart card up to a light to check for counterfeit. Therefore in the future, if your computer chip accepts value from another computer chip, the view is we have to guarantee that. So people are better protected than with cash.

Also, if they lose their cash, they have lost their cash. There is no centralised processing of transactions with cash. So it is much like if I take \$100 out of the ATM and I lose it, I cannot go back into the bank and say "Gee, I lost that \$100. Can you replace it?", because the bank has no way of stopping someone from spending that money. And so, generally consumers want their cake and eat it too – they want their privacy, but they want to be able to get their value back, but they cannot have both. And again, I encouraged you at the beginning not to think about this as a credit card or a debit card, because consumers are accustomed to seeing this sort of plastic and they say "Gee, if I lose it I just phone up and say I have lost the card and then I am protected". You have to think of this as your wallet, and if you lose your wallet or it is stolen, the cash is gone.

What if a "transfer value" fails? Again, the consumer is protected and Mondex has a way of recording when a transaction is partially complete but does not get completed. Actually each chip keeps that information – the two chips that were talking – and then the next time that you are interacting with your financial institution, the financial institution actually grabs those records relating to the failed transaction. Those records are "matched", with a failed transaction record from the merchant's chip where you were buying something. The value is given back to the parties that were involved. So there is protection against malfunctions and value transfer failure.

Liability: Probably the biggest question here is liability. I talked about providing the guarantee to consumers and merchants for the value of their e-cash. There is potentially a very big guarantee.

One has to be very confident that this is not going to be cracked. If you look at the participants in Mondex – I have not mentioned them – but they are the leading banks in every country that is involved in Mondex and they are obviously not setting themselves up for a big hit in terms of counterfeit value. So the question is, who is liable? It is a global system, a global scheme, multi-currency. The currency could be fabricated somewhere else in the world and transferred instantaneously somewhere else. Australian Mondex e-cash is guaranteed by the Australian members through the originator.

I talked about prevention. Mondex has really focused on preventing counterfeit and it is a system that continually gets upgraded so that the security is at a level that is very difficult for a counterfeit to be created. It evolves.

Fundamentally in Mondex there are two main options about how this liability is worn. Consumers and merchants that have a direct claim on the originator for their value. If something went wrong in the system and a consumer had \$100 on their card, where do they go to get their \$100? Theoretically – they go right to the originator, because that is where the value is held centrally. However, it is not all that easy. It would be like saying to people that you have to go to the central bank somehow if you wanted to redeem your notes that you carry today.

Another option is that the claim is on the individual member and then that member has a claim on the originator. This is I suppose an interesting model. However, if you think about the ability to transfer value from person to person, the value is not "stuck" on any particular bank's card. I have here, for example, a National Australia Bank Mondex Card. Let us say something goes wrong and for whatever reason I as a consumer decide that I want to transfer this value to my wife's card and she got her's from the Commonwealth Bank and she is going to put that claim on the Commonwealth Bank, you cannot contain the dollars to particular institutions. So this actually is one that does not work, it is actually not fair in that example I gave you – Commonwealth Bank would have to pay out when it really was not value that they issued.

What we ended up doing in Mondex is having a solution of a contractual claim and the liability rests on the originator; it is a direct claim. But in terms of how one gets their money, that is done operationally through a member.

This question of minimum technology standards for all e-cash is a very interesting one. John talked about technology neutral – governments say "I want to be technology neutral". Well if you think about this sort of product, what if there were ten different players in Australia and they all had the idea they wanted to introduce this sort of electronic currency? One decides well I want to do this really cheaply. Using inexpensive smart cards? What if that means that the industry or consumers are actually facing a high degree risk of counterfeit? And I think governments need to think about this. It is easy to say they want to be technology neutral, but on the other hand there are needs to protect the integrity of the industry and the integrity of the currency. So I think there are actually some real issues to be faced there. I do not believe that a completely hands-off approach is going to work. There are going to have to be some minimum standards, but somehow they are going to have to accommodate different technological approaches to achieve that.

The visual on the bottom of this page is about money laundering. One of the things that Mondex does is it gives us the ability to have some degree of control over how value flows. Mondex is designed to be like cash for consumers, but there are rules about what happens to the cash once it has actually been spent by consumers. And generally the money has to flow back into the system so that counterfeit can be detected. There is very limited opportunity for crooks to launder money through businesses because money would get on to a merchant's smart card which is actually different from a consumer smart card in the Mondex world and then that money would have to come back into a financial institution. So by using Mondex we can actually help the people who are trying to prevent money laundering.

Very briefly, in a couple of minutes. I talked about this being a computer and there is one application running on that computer (ie e-cash). So think about this as your home PC – you probably run word processing and e-mail and so on. This year we are introducing a multi-application capability and it is much like Windows for a smart card. This is still a relatively

inexpensive computer; it is not a Pentium II; I do not think people want to spend the money to carry around that sort of technology, but one can actually run a number of programs. So you will see Mondex, credit card details, debit card details can be stored on the chip, with a higher level of security than the magnetic strip provides today, and the industry will move to credit and debit operating on the chip. There is lots of opportunity for different sorts of loyalty programs and merchants are very excited about that. Also the cards can carry information to enable access – either access to buildings, physical access, or logical access such as on the Internet. I showed you this National Australia Bank Mondex Card. Their staff use this in their building to get in and out of secure areas, and of course it also carries cash for use in their implementations.

If you think about multi-application and what this does in terms of legal and regulatory questions – potentially a number of different parties are involved in the chip and provision of the different applications that are running on that computer – and it raises a fair number of additional questions. Whose chip is it? What happens when something goes wrong? And a lot of these issues are still really being addressed today.

I hope you have enjoyed looking into the future with me today. We are always happy at Mondex Australia to follow up with anyone who has more questions, if they would like to discuss the issues in more detail. Thank you very much.

Electronic Banking and Funds Transfer Session



Legal and Market Implications of Electronic Cash

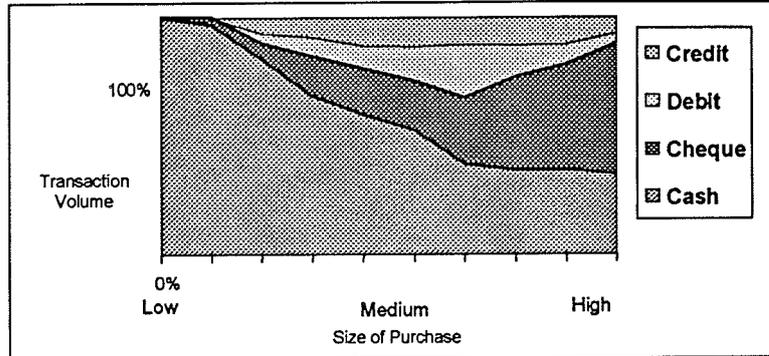
Don Gregg
CEO Mondex Australia

June 5 1998

Today's Discussion

- Cash - Why replace it?
- Mondex - The Product
- Mondex - The Scheme
- Mondex - Legal and regulatory challenges
- Multi-application

Cash Is Still The Most Common Payment Choice



Cash is still used for approximately 80% of consumer purchases in Australia annually

Cash Is Still King

- Universal acceptance
- Immediate transfer of value
- Privacy of transactions
- Cost of alternatives (e.g. cards) may seem high
- No special equipment or telephone lines required
- Person to person capability
- Consumer habit



Cash Works, So Why Replace It?

- Increasingly expensive to handle
- Must physically obtain it
- Comes in inflexible fixed amounts
- One often needs coins to make certain purchases
- Attractive to steal
- Risk of counterfeit
- Dirty
- Doesn't work on the internet



Challenge: To reproduce the advantages of cash, without the disadvantages

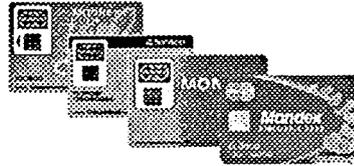
The Challenge Of Replacing Cash

- Reproduce the characteristics of cash
 - Transfer from person to person
 - Without reference to creditworthiness of the person paying
 - Immediate value (no clearing system required)
 - Privacy of transaction
- Address the disadvantages of cash
 - Handling costs
 - Risk of counterfeit value



The Mondex Card

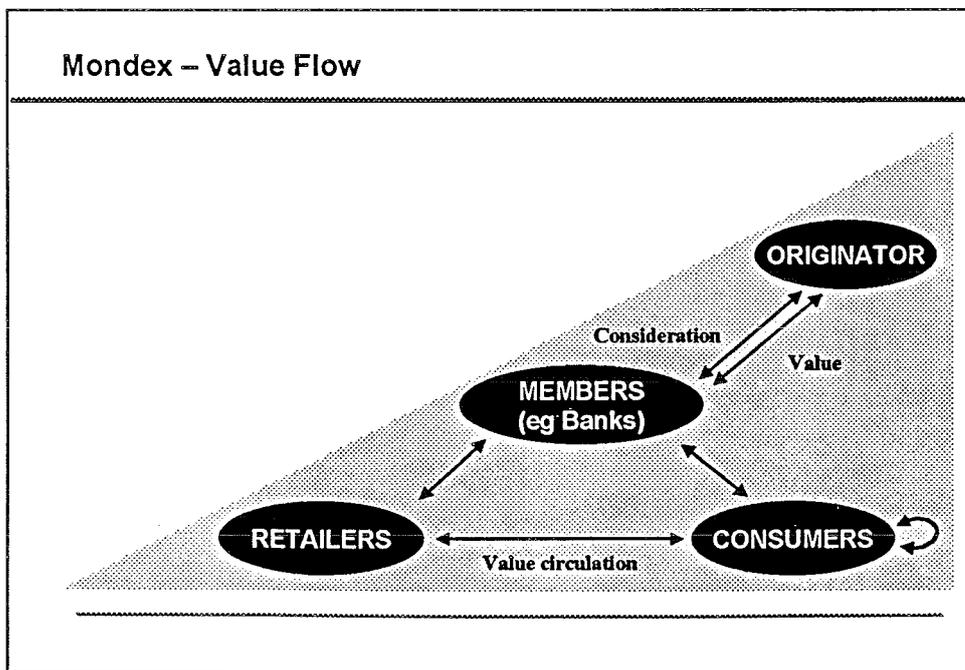
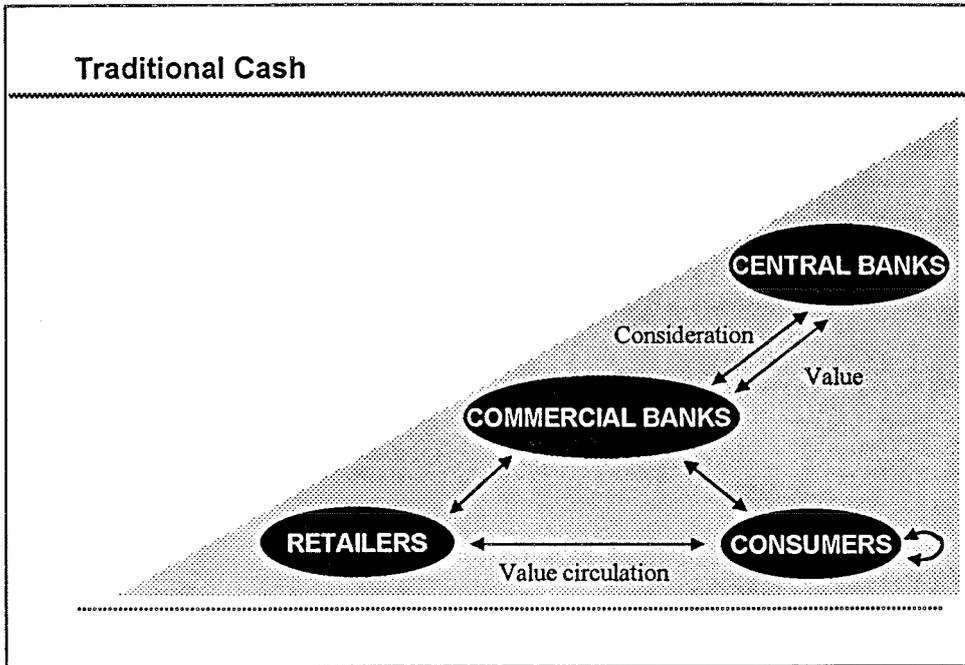
- Computer chip embedded in a plastic card with a micro processor and operating system
- Contains an electronic Purse program that stores electronic value
- Allows secure transfer of Mondex Value (by using cryptographic algorithms and digital signatures to ensure authenticity) to another Mondex Card when inserted into a Mondex compatible device - phone, PC, wallet
- Designed for international use

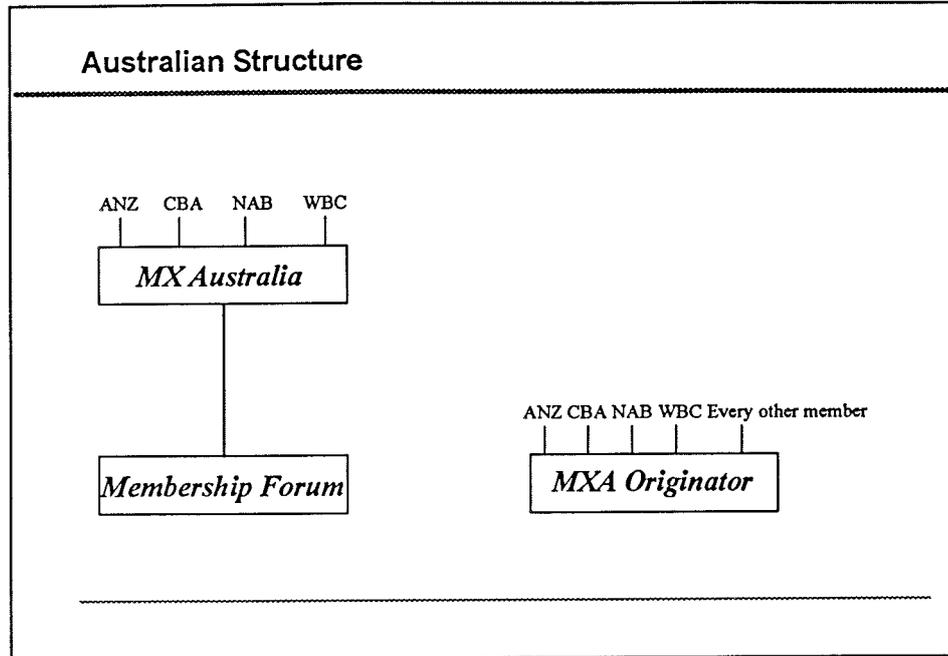


Mondex E-cash - The Cost Effective And Convenient Solution

- Immediate cash transfer from one card to another
 - No central processing
 - *Enables person to person transfers*
 - *Secure loading/purchases over the Internet or telephones (including mobiles)*
- Reloadable via phone, PC or ATM
- Transaction log on chip
- High level of security
- Lockable with PIN number
- Global product
- Holds up to five different currencies of your choice







Legal and Regulatory Issues

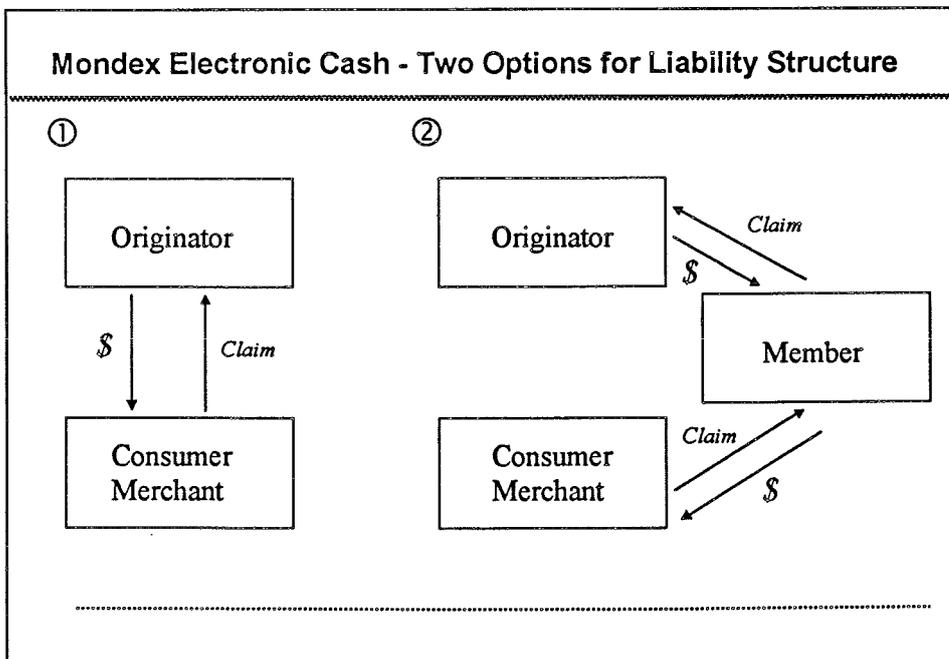
- Application of existing legislation and regulatory regimes
 - eg - EFT Code, Code of Banking Practice and Austrac
 - Who should be able to issue electronic value?
 - Which jurisdiction applies in multicurrency/multicountry e-cash?
- Privacy Vs need for a limited audit trail
- Law enforcement - use of transaction data

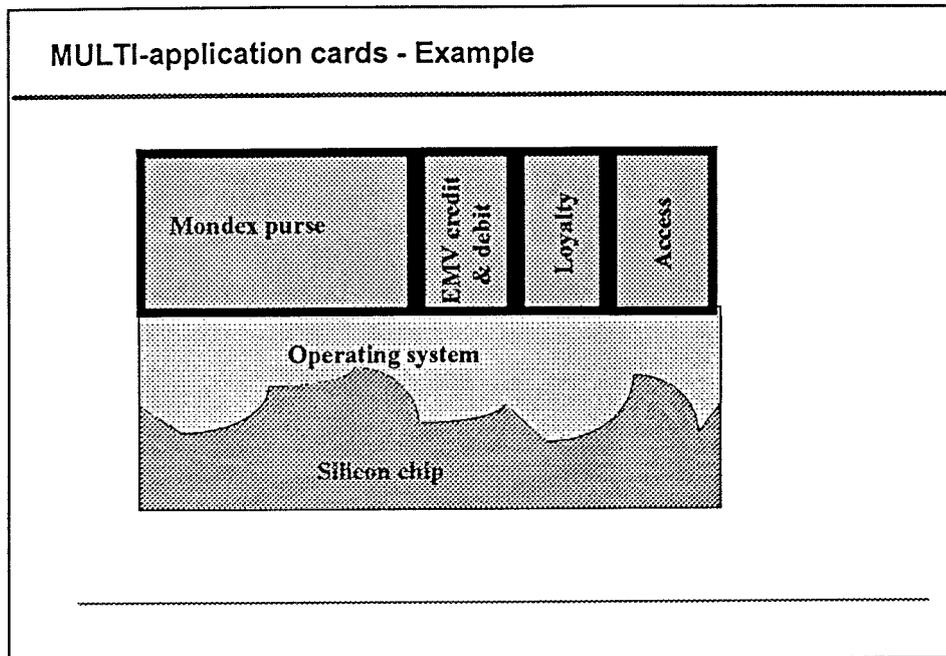


Other Legal and Regulatory Issues cont...

- Consumer protection
 - Card lost /stolen
 - Transfer of value fails
 - Card malfunctions
- Counterfeit value and money laundering
 - Liability
 - Prevention
 - Minimum technology standards?

The diagram illustrates a money laundering process. On the left is a genuine 10 Euro banknote. An arrow points to a stylized machine, possibly a copier or scanner. Another arrow points from the machine to a counterfeit 10 Euro banknote on the right.





Multi-applications on a Single Card

- Share costs
- Windows™ for the smart card
- MULTOS Operating system - available this year
 - Global open industry standard
 - Multi-supplier
 - Supported by world's leading smart card companies
 - Add/delete applications remotely over insecure channel
 - Flexibility with security and control (chip, firewalls)

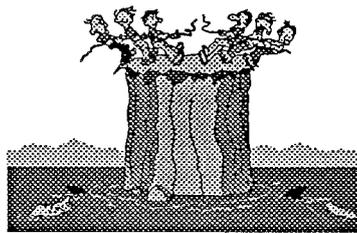

Buy two get one FREE!

Additional Legal Issues of Multi- Application

■ Sharing the chip with third parties

- Who will "own" the chip?
- Who will "own" the customer?
- Who will "own" the application?
- Who will "own" the information on an application?
- Who's responsible when things go wrong?

Mine!



Mine!

Yours!

More Information?

- MONDEX Electronic Cash : Mondex Australia 03 9654 8814

