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Re: Seema Misra

2nd Interim Technical expert's report to the Court prepared by Charles Alastair McLachlan, a Director of Amsphere Consulting Ltd.

Staple Hall
87-90 Houndsditch
London EC3A 7AD
England

This report contains 33 pages

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1   Introduction

1.1   Instructions

1.1.1   I am Charles Alastair McLachlan, a Director of Amsphere Consulting Limited, London, England specialising in information technology consulting. I have been instructed in this matter by Coomber Rich Solicitors, on behalf of their client, Seema Misra, ("the Defendant") to assist the court in this matter of alleged fraudulent accounting in providing expert evidence on the questions posed at 1.1.3 hereunder.

1.1.2   The allegations arose from the discrepancy between the transactions as recorded in the Horizon system provided by Post Office Counters Ltd through a service agreement with Fujitsu and the cash on hand at the defendant's Post Office branch.

1.1.3   I was instructed to visit a sub post office in the Midlands and the sub post office at West Byfleet to review the operational procedures and IT systems implemented at the two sites in order to:

a.   Understand the basis upon which standard operational procedures would provide evidence to identify and resolve discrepancies arising from the use of the Horizon system.

b.   Understand the elements of the end-to-end IT architecture which could be the source of discrepancies as a result of defects in the operation of the software, hardware, network or integration with 3rd party components.

1.2   Qualifications

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1.2.1   I have been working in the software industry since my first job at the age of 17 writing software analysing the results from a particle accelerator for the UK Atomic Energy Authority

1.2.2   I obtained an M.A in Computer Science from Cambridge University matriculating in 1979.

1.2.3   I developed software for environmental control systems for a company on the Cambridge Science Park while at university.

1.2.4   I was retained by Cambridge University to do undergraduate teaching for three years.

1.2.5   After University, I worked for the company of the Emeritus Professor of Computer Science at Imperial College (and founder of IBM UK Hursley Laboratories), developing PC multi-tasking office automation software. As the company transitioned to IT consulting, I advised HP on their Unix Strategy and looked at the potential for hosting Inmos parallel processors in PC environments. I also built an extensive financial performance analysis system for the Building Society industry.

1.2.6   In 1987, I became the founding partner of CMJP Associates which delivered software development services to a wide range of clients using PC and Client-Server technologies.

1.2.7   A number of these projects included the development of accounting modules and work for the Financial Services industry including SG Warburg, GNI (of the London International Financial Futures Exchange LIFFE).

1.2.8   In 1991 I established a partnership for CMJP Associates to provide expert advice to the Client Server Centre of Excellence.

1.2.9   In July 1993 I became the founding Technical Director of Infonet Stystems. Infonet Systems focused on building leading edge object oriented Client-Server solutions. Its first success was the delivery of a complete front office trading platform of financial derivatives (repos and bonds) in four weeks. This was the first NT based client server trading desk in the City of London. While at Infonet, I developed the Object Oriented Just In Time software development methodology.

1.2.10   In December 1996, I was recruited by the European headquarters of emerging internet service provider UUNet (shortly to become part of MCI Worldcom), to advise on IP billing and customer provisioning systems. A key element of the assignment was to undertake a critical review of the implementation and customisation of the GEAC Smartstream ERP solution by Arthur Andersen Business Consulting.

1.2.11   In August 1997 I was recruited by Arthur Andersen Business Consulting to provide technology leadership for the new Advanced Technology division. Over the next five years, I became the international thought leader in the building of software related services that underpinned the development of Andersen's New Media and eBusiness practice. This was recognised by election to partnership in 2000.

1.2.12 Early identification of the crucial role for **Java** technologies and **'just in time'** business and technology development methods, positioned the emerging Business Consulting (BC) division for rapid growth on the Internet wave to become 9th globally by Quarter 3 2001. Achievements during this period cover:

1.2.13 *Major systems delivery projects* The software development related service revenues were the **fastest growing** area of the fastest growing global consulting organization between 1997 and 2002. My team delivered marquee projects for key clients including: launch of **Sky.com**, **TimeOut.com**, **myTravel.com**, **Cendant**'s Move.co.uk, pan-European systems for **Budget-Rent-a-Car**. I was also engaged as a technical delivery expert for major new systems types including on-line trading exchanges, high throughput customer services systems, on-line transaction processing systems and content management systems.

1.2.14 *Solution Development:* I provided technology leadership for the development of key **global solutions** for BC including: eStrategy, **eBusiness**, Content Management, Experience Design, Component Based Development, **Business Architecture**, Enterprise Integration, Datawarehouse, Technical Architecture, **Active Intelligence**^{TM}, Anti-Money Laundering, Telco Fraud Protection.

1.2.15 I was the recognized methodology and risk management expert for software related technology solutions across Andersen.

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1.2.16 I worked closely with the Computer Risk Management practice in the Andersen Audit practice to perform technical due diligence, project risk reviews and advise on project recovery.

1.2.17 *Capability Development* One of my key strengths was the recruitment, training, development and motivation of deeply technical teams to perform successfully in a 'Big 4' consulting environment.

1.2.18 Operating first as the founding director of Andersen's **Global Software Engineering Centre of Excellence** and then as a member of the **Global Advanced Technology Advisory Team**, I became one of a small number of newly appointed partners building the **technology integration** skills at the heart of BC's growth strategy.

1.2.19 I provided technical leadership for the development of the core component based **rapid implementation methodology** and acted as the expert for methodologies built on this foundation including **eBusiness**, **eMarketplace**, Content Management, Datawarehouse, Business Architecture, **Enterprise Integration** and **Customer Management**.

1.2.20 Other achievements include implementation of the first successful **Knowledge Management** Capability Maturity Model for the UK practice; establishing a **global virtual community** of 2,000 software developers; developing alliance relationships with **BEA, Microsoft, Sun** and a variety of specialist technology providers; sponsorship of Computing for Business MSc at **Imperial College**, development of four technology training courses for global roll-out; delivery of a **technology competency model** for all practitioners globally.

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1.2.21 I am currently working as an IT and Technology Risk consultant as a Director of Amsphere Consulting Limited.

1.2.22 Recent assignments include:

- Advisor to board of advisor to board of interactive satellite broadband start-up

- Recovery of failing project at Big '4' consulting firm

- Associate editor Butler Group, the IT strategy consulting information service company.

- Design and implementation of delivery risk management system for an off-shore software development company

- Project delivery for an applications management business

- Report on XML related integration and data quality risk for JP Morgan-Chase

- Expert witness including cross examination in an ICC Arbitration between 3 national banks and an international provider of banking accounting software

- Expert witness in a High Court action relating to the quality of software testing between an international mobile telephone operator and an established mobile telephony systems integrator.

- Expert advisor in action between Geographical Information Systems provider and off-shore software development services provider.

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1.2.23 I am a former Director of UCL Consultants (founded by University College London) which is responsible for providing professional consulting services from members of UCL.

1.2.24 I am a Partner of the Transformation Development Partnership LLP.

1.2.25 I was appointed Visiting Professor of Software Enterprise at University College London in 2005.

1.2.26 I have worked with IT organisations of all scales from small businesses to international global organisations.

1.2.27 I mentor small businesses owners through the Academy for Chief Executives.

1.3   Confidentiality

1.3.1   This report is strictly private and confidential and has been prepared at the request of Coomber Rich Solicitors on behalf of their client, for the Court.

1.4   Legal and factual issues

1.4.1   This report should not be read as expressing any opinion on factual matters which depend on disputed testimony of the witnesses of fact, or legal issues. It, however, inevitably reflects my understanding of the position.

1.5   Sources of information

1.5.1   In preparing my report, I have read and considered the following documents:

a.   Summary of facts prepared in accordance with Rule 21.3(1)(b) of the Criminal Procedure Rules 2005;

b.   The Indictment – The Queen v Seema Misra;

c.   Witness statement of Keith Noverre 8th January 2009;

d.   Witness statement of Elaine Ridge 9th January 2009;

e.   Witness statement of Lisa Jane Allen 12th January 2009;

f.   Witness statement of Adrian Morris 6th January 2009;

g.   Witness statement of Jon Longman 29th May 2009;

h.   Witness statement of Javed Salim Bidiwala 13th April 2006

i.   The statement under Section 9 of the Criminal Justice Act 1967 of John Kidd

j.   The Audit of Post Office ® West Byfleet branch, FAD 126023 – Action Plan Appendix A

k.   The Witness statement of Andrew Paul Dunks 24th June 2009

l.   The exhibits provided running from pages 1-35 insofar as the copies provided are legible.

m.   The systems architecture for the end to end process from Point of Sale terminal to Electronic Funds Transfer for a leading UK retailer

1.6   The scope of my work

1.6.1   I report as an expert witness, not as a witness of fact.

1.6.1.1   I have reviewed the documentation provided to me.

1.6.1.2   I have not undertaken an operational review of the software solution Horizon system.

1.6.1.3   I have not had access to any documentation or test data relating to the Horizon system

1.6.1.4   I have attended a sub post office in the Midlands reporting regular cash discrepancies, interviewed the sub postmistress, reviewed the operating procedures in the sub post office and reviewed the capabilities of the Horizon system.

1.6.1.5   I have attended the sub post office at West Byfleet named in these proceedings, interviewed one of the attending investigating officers, reviewed the operating procedures in the sub post office and reviewed the capabilities of the Horizon system.

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1.7 Independence

1.7.1 I have prepared an independent and objective report addressed to the Court. I have had no previous involvement with the Defendant. I have no previous involvement with Coomber Rich Solicitors.

1.7.2 Amsphere's fees in this case are not dependent on the result of the proceedings in this matter.

1.8 The structure of my report is as follows:

1.8.1 At Section 2, I report my preliminary findings following the visits to the two sub post offices.

1.8.2 At Section 3, I reconsider "What hypotheses could support the Defendant's claim that the Horizon system was the source of the accounting discrepancies?"

1.8.3 At Section 4 I reconsider "What evidence needs to be provided in order to determine the merits of the Defendant's claim?"

1.8.4 At section 5 my expert's declaration is recorded.

2 Preliminary report of findings during visits to a sub post office in the Midlands and West Byfleet

2.1 Findings during visit to sub post office in the Midlands

2.1.1 Background of sub postmistress

2.1.1.1 The sub postmistress responsible for the sub post office we visited in the Midlands asked that she retain her anonymity at this stage in the process because she is very fearful of being suspended. However there are some relevant details that she was ready to have appear in the report:

2.1.1.2 She has a previous career in banking with a major retail bank and had previous bank teller experience before moving to export/import credit products.

2.1.1.3 She is familiar with handling detailed and complex documentation from her experience at the bank.

2.1.1.4 She has been a sub post mistress for more than 10 years and only took on the sub post office in order to be able to have her elderly disabled mother live where she worked and in order to be close to her children as they grew up.

2.1.1.5 She has been recognised by the Post Office for her bravery in her response to being shot at by armed robbers on more than one occasion and she

commented to us "why would I steal money from my own business when I have already demonstrated that I will put my life at risk to protect it?"

2.1.1.6   Her husband and her children are all qualified graduates.

2.1.2   Background to issues at the sub post office

2.1.2.1   The sub post office is operated by a husband and wife team together with their son.

2.1.2.2   The sub post office has 3 counter terminals which are operated on a shared stock basis

2.1.2.3   The premises housing the sub post office include a small shop selling a limited range of envelopes, gift card and other post related accessories. The lottery terminal is on the shop counter. We were advised that sales in the shop are between £200-£300 per week compared to a monthly transaction volume at the post office counter of between £200,000 and £300,000 per month.

2.1.3   Pattern of discrepancies

2.1.3.1   The sub post mistress explained that her experience is that there are almost no discrepancies that she has to record against the stock.

2.1.3.2   There are also almost no discrepancies that she has to record against the physical cash held in the shop.

2.1.3.3   There are consistently discrepancies arising from the use of debit cards or post office cash account cards. Not sure I understand what is meant by a "discrepancy" in this context. My understanding is a discrepancy is where the system derived value for an item differs from that physically in the Stock unit and so this only applies to Cash or Stock. The Value of Debit (and Credit) Cards and POCA Cards is handled as a "Payment" and should balance with the corresponding "Receipt" recorded for the goods or Service that they are used for.

2.1.3.4   The value of discrepancies has increased as the proportionate value of card use has increased.

2.1.3.5   If an "Account Payable" or counter credit is entered the Horizon system assumes that there is a corresponding receipt (either physical cash, debit card transaction, Post Office Cash Account card transaction or cleared cheque). True, and this is ascertained during the Settlement process.

2.1.3.6   The post mistress used to receive discrepancy reports generated by the Post Office identifying when there was a mismatch between the counter credit recorded at the counter and the cleared cheque or debit card amounts reported to them by their correspondent banks or card merchant provider. She no longer receives these and concludes that the Post Office function that provided this service is non-operational or insufficiently staffed to properly reconcile all of the discrepancies. These discrepancies, if left

unresolved, could create a liability for the sub postmistress. POL to answer. (Wouldn't there be Transaction Corrections now for any such discreancies?)

2.1.3.7   If stock is sold, the Horizon system assumes that there is a corresponding receipt (either physical cash, debit card transaction, Post Office Cash Account card transaction). And it requests the User to specify how it is settled for and accounts for it accordingly.

2.1.3.8   If at the end of the monthly period there is a discrepancy between the cash on hand and the credit balance expected by the Horizon system then the only way to close the period and start a new period is to "make good" the cash discrepancy and declare that the cash on hand has been brought up to the expected credit balance.   There is no mechanism to record the discrepancy in a suspense account for subsequent investigation and resolution.   The system imposes a declaration as part of the operating procedure that the cash is on hand. If the actual reason for the discrepancy is due to a problem with a non-cash credit (e.g. incorrectly processed card payment, incorrectly recorded cheque payment) then there is no opportunity for the sub post mistress to note her concerns on the system. This was the requirement made by POL of the system.

2.1.3.9   The sub post mistress demonstrated the following transactions in which the use of a debit card could result in a discrepancy in the cash account (physical + debit card/POCA amounts) at the sub post office: Cash and Plastic are handled separately in the accounts.

2.1.3.10 Account Payable using a Debit Card / POCA card: the customer is seeking to make a bill payment of council tax using a debit card. The card is

apparently authorised at the PIN terminal for the required amount. The card receipt is apparently credited to the sub post office account. The council tax payment is debited from the sub post office account. However, during the end to end electronic fund transfer process the fund transfer fails. The central Post Office account never receives the expected electronic funds. It is supposed that the end of day process identifies that there is no credit corresponding to the bill payment and therefore there must be a cash discrepancy. This needs to be explained more carefully. What exactly was observed to happen here? The back end settlement between the Merchant Acquirer and Post Office Ltd is totally separate from the accounting done in the Local Branch. Provided the Debit Card transaction is Authorised by the MA, then the Branch Accounts will record the Debit Card payment as the MoP. However if the MA doesn't authorise the transaction then an alternative MoP is required. What action is taken should the MA fail to honour the authorised payment and whether that results in a TC being sent to the branch to reclaim the funds is a separate issue outside my knowledge, but POL should be able to clarify that. Note that such rejections are rare. It is the responsibility of the clerk to ensure that the Debit Card payment was successfully authorised by the MA and to check the response received. Should they not do so and **assume** it was processed and touch "Fast Cash" to clear the basket **without looking at the screen**, then indeed the system might record a Cash transaction.

In summary, if the Debit Card payment says that it works at the time, then it is recorded as such in the branch accounts. There is no automatic feedback into the branch accounts from any subsequent MA rejections.

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2.1.3.11 Debit Card/POCA withdrawal: the customer is seeking to receive an over the counter payment of cash from their debit card or POCA facility. As above [2.1.3.10] the card is apparently authorised but in fact the fund transfer fails at some point and the sub post office account is debited with the cash at the counter terminal but this is not recorded centrally against a debit card fund transfer. There is therefore an apparent cash shortfall in the till. The Horizon system only prints a receipt for the customer; there is no debit voucher for the counter staff to place in their till. At the end of the day or the end of the week it is not possible to physically reconcile the cash payments with debit vouchers. There are clear messages to the clerk indicating whether or not any Banking or Debit Card transactions was authorised. As above there is no subsequent automatic correction due to any subsequent failures. I accept that there is no Branch Receipt produced for paper reconciliation purposes. We were specifically requested not to produce one by POL.

2.1.3.12 In either of the two cases above [2.1.3.10], [2.1.3.11] the electronic funds transfer mechanism duplicates the fund transfer. This could result in the expected credit balance at the sub post office being higher than it actually is. The sub post mistress will be expected to make good this discrepancy with cash. Sorry, but I don't understand the point being made.

2.1.4   Operating procedures

2.1.4.1   We discussed the operating procedures implemented at the sub post office in the Midlands in great detail with the sub postmistress. In my opinion, she demonstrated the trained eye for detail and procedure that I would expect from somebody with her professional experience.

2.1.4.2   She demonstrated a range of features of the Horizon system that showed how stock and cash were tightly connected across the system and how the system had built-in mechanisms to link stock sales with cash receipt.

2.1.4.3   She also demonstrated the weaknesses of the system in relation to the use of the debit card/POCA terminal:

- the lack of counter vouchers, This was a specific POL request

- the requirement to record some debit terminal transactions as cash receipts, This may need to be explored further. I'm not aware of any such requirement other that in the area of Refunds.

- the delays in the system at busy periods, Again I'm not sure what the relevance of this is. My understanding is that the response time for online trasanctions is very good

- the lack of certainty as to whether a transaction completes when there is a break in network connectivity There should be clear messages in all cases as to whether the clerk should assume the transaction was succeful or not. In the case of a comms failure the assumptions should always be that the transaction has failed. Recovery processes will allow this to be confirmed afterwards.

2.1.5   Capabilities of Horizon

2.1.5.1   Horizon terminals are capable of working in on-line and off-line mode.

2.1.5.2   The terminals are required to be left on overnight in order to permit two way data transmission and software updates.

2.1.5.3   All of the facilities of Horizon are available in off-line mode except debit/POCA transactions and access to information from the DVLC required to issue vehicle licences. There are other exceptions now.

2.1.5.4   The Horizon system sells postal services, provides foreign exchange, supports receipts of cash, cheque and debit card/POCA for Accounts Payable services and supports payment of cash from debit card/POCA accounts. Also other banking online services for A&L and via Link

2.2   Findings during visit to sub post office at West Byfleet

2.2.1   Operating procedures

2.2.1.1   I was able to confirm my understanding of the operating procedures from my visit to the sub post office in the Midlands.

2.2.1.2   It was clear that there is no standard operating procedure to reconcile counter credits with the actual amounts recorded. This could give rise to a range of discrepancies which the sub post mistress would rely on the Post Office to identify and reconcile. If the Post Office failed to do so then overstated amounts could give rise to a deficit at the sub post office which the sub post mistress would be required to make good with cash. Again I'm not sure what is meant here. POL should comment on their processes.

2.2.2   Capabilities of Horizon

2.2.2.1   The West Byfleet sub post office is set up to operate with each counter having a separate stock.   Although this assists with stock control and ensures that stock discrepancies can be localised, it does not provide any assistance in management of discrepancies in debit/POCA receipts (no vouchers are automatically printed) or Accounts Payable and counter credit discrepancies (standard operating procedures do not reconcile these on a daily basis).   Again for POL to respond.

2.2.3   Approach of investigating officers to system issues

2.2.3.1   On our visit to West Byfleet, we had an opportunity to raise some questions with one of the investigating officers that attended on the day of the audit that gave rise to these proceedings.

2.2.3.2   He made it clear that it was Post Office policy that investigating officers should never consider systems problems as relevant to their enquiries.

2.2.3.3   He agreed that the Horizon system provided no paper record of debit/POCA vouchers and therefore that a sub postmaster/mistress would not be able to produce any evidence that a customer had received a receipt for a debit/POCA transaction.   This info is available in the Audit data which can be supplied as evidence

2.2.3.4   He accepted that the Horizon system, as supplied, which the sub post master/mistress was required to use under contract, did not provide the

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facility for the sub post master/mistress to reconcile discrepancies that might arise in the operation of the system. This is down to POl requirements.

2.2.3.5 He accepted that there was no Post Office requirement that he should understand the operation of the Horizon system in order to properly conduct his investigations.

3 What hypotheses could support the Defendant's claim that the Horizon system was the source of the accounting discrepancies?

3.1 Background

3.1.1 Accounting systems are usually designed around a 'double entry' booking keeping principle. The double entry book keeping principle means that for every entry into the system there is an equal and opposite entry that should maintain the 'balance' between the accounts. Horizon follows this principle.

3.1.2 So, for example, if somebody at the till sells a stamp for £1 paid in cash then the stock account would be reduced by £1 value of stock and the cash on hand account would be increased by £1 – overall the balance between the accounts would be unchanged. Horizon does this.

3.1.3 As part of the process of financial control, it would be normal for the value of stamps to be physically counted and recorded (stock value) and the value of cash on hand physically counted and recorded (cash value) and these two values compared ('reconciled') to what is recorded in the accounting system. This is required as part of the Stock Unit Balancing process which should happen at least once per month and can be done as often as required. In particular Cash should be Declared (and variances checked) daily.

3.2 Hypothetical issues with the Horizon system

3.2.1 The User Interface gives rise to incorrect data entry: poor user experience design and inadequately user experience testing can give rise to poor data

entry quality. In cases that users are working under pressure, insufficiently trained or are using a system presented in a language different from their first language the problems of data entry can be exacerbated. I'm not sure what is meant by UI gives rise to oor data entry. Training matters are down to POL.

3.2.2 The Horizon system fails to properly process transactions: accounting systems are usually carefully designed to ensure that accounts balance after each "double entry" transaction. In particular, a database technology referred to as 'two-phase' commit is used to ensure that either both entries or neither entry is recorded on the system. Horizon does properly process transactions and does ensure that double entries are always both committed atomically. There is no need for a 2 phase commit as such in the branch accounts, but the design of the interfaces to both the MA and POCA ensure that the view of the transaction as recorded in the Branch is the "correct" view and other systems are adjusted (if necessary) to match this view through various reconciliation processes.

3.3 Comments on Hypothetical issues following site visits

3.3.1 There are opportunities for incorrect data entry (e.g. entry of £2,000 for a cash credit rather than £200) to give rise to discrepancies in cash recorded on Horizon versus cash held at the till. The sub post office relies on the consistent, accurate and timely resolution of these discrepancies by the Post Office and the operators of the Horizon system. The sub post master/mistress has no standard operating procedure or local record that protects them from the failure of the Post Office or the operators of the Horizon system to deal with the discrepancies. Perversely, the Post Office and the operators of the Horizon system have no incentive to resolve discrepancies that appear as cash

losses at the post office counter because the sub post office contract makes the sub post master/mistress personally liable. I agree that the system just records what the user enters, but there is little that can be done to resolve that. However when cash is deposited messages are displayed requiring the Clerk to check the amount deposited which should minimise such errors.

3.3.2   The Horizon system does not appear to be a single monolithic mainframe based system with computer terminals with no independent processing capability. Rather the architecture relies on a number of inter dependent units: the individuals nodes (counter terminals) at the sub post office each with its own processing unit with an attached keyboard, touch screen, barcode scanner, debit card authorisation PIN terminal and printer and a network router to the wider Horizon system. Each of these components could give rise to faults that result in discrepancies: either due to problems within the components or due to problems from interaction between the components. I accept that currently Horizon does depend on data recorded and held on the local system which is then replicated to other cunters and the central system. However I am unclear why this is considered to be a fault.

3.3.3   Within the central Horizon system that is not directly visible to the counter operators I would expect there to be a set of inter-operating components that could give rise to malfunctions and discrepancies. In particular, the end to end dialogue between the counter terminal, the card authorisation terminal, the network, the core Horizon system, the electronic funds transfer component, the authorising merchant service and the central post office branch accounting system is a long running transaction with multiple points of possible failure. Agreed that this is complex. However the key point is that the end result as seen at the counter is what is displayed to the clerk and

what goes into the accounts. Any hypothetical corruption (and I'm not aware of any issues in that way) in other systems should not result in any discrepancies at the Branch. In particular should no response be received, then the clerk will be advised of this and it must be assumed that the transaction failed.

3.3.4   Complex systems of this nature rarely have sufficient capability built in to deal with all possible failure points and discrepancies are very likely to arise which require manual intervention based on the reconciliation of paper and electronic logs at different points in the system. When the end to end system does not provide the counter staff with access to paper or electronic logs at the point of use then it is impossible for them to identify whether there is a system fault or operator problem. There are full logs, but I agree that they are not all made directly available to the end user. I suspect that this is trune in any complex system. There are mechanism by which details of individual transactions can be printed off from the system if there is some uncertainty via the "Transaction Log" Reports.

4 What evidence needs to be provided in order to determine the merits of the Defendant's claim?

4.1 Errors in operator data entry are not properly reconciled by the Post Office finance function or by the Horizon system.

4.1.1 The first problem with the provision of evidence is that the Horizon system does not automatically provide a paper voucher for retention at the post office counter when funds are withdrawn using a debit card or Post Office Cash Account card. Therefore the sub post office has no mechanism for reconciling the result of downstream processing by the Horizon system and the Post Office with what occurred at the sub post office counter either at the time or when discrepancies are identified at the end of the weekly trading period. In effect, the Horizon system makes it impossible for the sub post office to demonstrate an error occurred in the downstream processing. This is down to Post Office Ltd.

4.1.2 The second problem with the provision of evidence is that the Horizon system does not automatically provide a paper voucher for retention at the post office counter when funds are credited to the sub post office account as part of a bill payment (Accounts Payable) as a result of a withdrawal using a debit card or Post Office Cash Account card. Therefore the sub post office has no mechanism for reconciling the result of downstream processing by the Horizon system and the Post Office with what occurred at the sub post office counter either at the time or when discrepancies are identified at the end of the weekly trading period. In effect, the Horizon system makes it impossible for the sub post office to demonstrate an error occurred in the downstream processing. Again this is down to POL.

4.1.3   The third problem with the provision of evidence is that the standard operating procedure for post office counter clerks does not include the reconciliation of bill payment or counter credit slips with the individual amounts recorded by the counter clerk onto Horizon. In effect, this standard operation procedure makes it impossible for the sub post office to identify any failures by the Post Office or the Horizon system in identifying or dealing with discrepancies arising from incorrect data entry. Again down to POL Processes.

4.1.4   The investigations identified below will assist in determining whether such evidence is available.

4.2   The Operation of the System gives rise to incorrect data entry

4.2.1   There are two elements to this possible cause

- The sub post office staff and, in particular, the sub post master/mistress is not trained in the proper operating procedures to deal with maintaining an auditable contemporaneous record that would protect their reputations in the event that faults in the Horizon system or operator error resulted in discrepancies between the actual cash position and the centrally recorded cash position. Horizon does maintain a full audit of what is recorded which can be made available to POL. I am also aware of at least one case where this information has been made available directly to a Defence Accountant.

- The sub post office staff are not properly trained in the use of the Horizon system. This is down to POL.

4.2.2   In order to understand to what extent sub post office staff are trained in the necessary operating procedures, it would be necessary to review the course material provided for counter staff and sub post masters/mistresses and to review the training and assessment processes implemented by the Post Office. Finally, it would be necessary to review to what extent the necessary operating procedures could feasibly be adopted and were in fact adopted in general operating practice and in the case of Seema Misra in particular. For POL to respond.

4.2.3   In order to identify whether Horizon system training is a possible cause, it would be necessary in the first instance to sit alongside a user operating in normal Post Office conditions that had only recently completed the standard systems training and who represented the kind of user engaged by the Defendant. For POL to respond.

4.2.4   If there is a pattern of incorrect data entry then it would be necessary to conduct a detailed examination of the kinds of incorrect data entry that occur and the implications for failure of accounting. Not sure exactly what is meant here. I'm aware of work within POL to explore errors in data entry and to come up with ways to reduce them.

4.2.5   There are two available technologies that could assist in examining cases of incorrect data entry:

- Screen capture technology installed on the user terminal that keeps a record of every key press/screen press and the associated screen shot. This is not practical. However the Audit trail that Horizon maintains does provide a fairly comprehensive record of what has happened.

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- Digital camera recording equipment positioned to have a clear view of the screen continuously recording the screen as it responds to operator entry This is clearly possible. A similar technique has also been used to benchmark system response times.

4.3   The Horizon system fails to properly process transactions

4.3.1   In order to identify whether this is a possible cause, it would be necessary in the first instance to examine the operations in normal Post Office conditions where there is an experience by the branch manager of what they believe to be incorrect transaction processing.

4.3.2   Further, if there is prima facie evidence of incorrect transaction processing, it would be necessary to review the technical documentation of the Horizon system and interview key individuals responsible for the system within the Fujitsu team in order to understand the potential source of the incorrect transaction processing. From my understanding of comparable retail systems architectures there are a large number of potential points of failure which could give rise to the kind of discrepancies reported by Seema Misra and the sub post mistress in the Midlands. In particular, I have reviewed the architecture for a national retailer and identified a series of possible failure points which are currently addressed by testing, review of error logs and reconciliation of discrepancy reports. See Exhibit "Point of Sale – Electronic Funds Transfer architecture". I don't see the relevance of this diagram. It is nothing like what Horizon does. We could if necessary provide some documentation and information on Horizon. However I am confident that

there is not a system problem and the issues are due to incorrect actions (whether deliberately or accidentally) by the user.

4.3.3   Based on the review of the technical documentation, it should be possible to identify and examine the various electronic log files maintained by different components of the systems architecture that are required by the Electronic Mastercard Visa (EMV) standard or for Payment Card Industry (PCI) compliance. These are probably available. (I'm not sure how long they are held and they will probably have had details of Cards Obfuscated for Security reasons as required by PCI.)

4.3.4   If the potential source of the incorrect transaction processing can be identified then it would be helpful to be able to reproduce the problems under controlled test conditions in a consistent and reproducible manner. This would require the assistance of Fujitsu in providing access to the test environments maintained in support of the Horizon system. Again this is possible.

5 My duties to the Court

5.1 I understand that my overriding duty is to the Court, both in preparing reports and in giving oral evidence. I have complied and will continue to comply with that duty.

5.2 I have set out in my report what I understand from those instructing me to be the questions in respect of which my opinions as an expert are required.

5.3 I have done my best, in preparing this report, to be accurate and complete. I have mentioned all matters that I regard as relevant to the opinions I have expressed. All of the matters on which I have expressed an opinion lie within my field of expertise.

5.4 I have drawn to the attention of the Court to all matters, of which I am aware, which might adversely affect my opinion.

5.5 Wherever I have no personal knowledge, I have indicated the source of factual information.

5.6 I have not included anything in this report that has been suggested to me by anyone, including the lawyers instructing me, without forming my own independent view of the matter.

5.7 Where in my view, there is a range of reasonable opinion, I have indicated the extent of that range in the report.

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5.8   At the time of signing the report I consider it to be complete and accurate. I will notify those instructing me if, for any reason, I subsequently consider that the report requires any correction or qualification.

5.9   I understand that this report will be the evidence that I will give under oath, subject to any correction or qualification I may make before swearing to its veracity.

5.10   I have included in this report a statement setting out the substance of all facts and instructions given to me, which are material to the opinions expressed in this report or upon which those opinions are based.

5.11   I confirm that insofar as the facts stated in my report are within my own knowledge I have made clear which they are, and I believe them to be true, and the opinions that I have expressed represent my true and complete professional opinion.

Charles McLachlan
Amsphere Consulting Ltd
Staple Hall
87-90 Houndsditch
London, EC3A 3AD
England

Thursday, 19 November 2009