

Witness Name: Jeffrey Kramer

Statement No.: WITN11080100

Dated: 13/08/2024

POST OFFICE HORIZON IT INQUIRY

FIRST WITNESS STATEMENT OF JEFFREY KRAMER

I, Jeffrey Kramer, will say as follows...

INTRODUCTION

1. I am a former employee of Imperial College London and held the positions of Professor, Head of Department, Dean (now referred to as Consul) and Senior Dean (Consul).
2. This witness statement is made to assist the Post Office Horizon IT Inquiry (the "**Inquiry**") with the matters set out in the Rule 9 Request dated 20 February 2024 (the "**Request**").

BACKGROUND

3. I have been asked to provide an account of my instruction by Post Office Limited ("POL") to investigate and opine on various matters relating to the Horizon ITSystem.
4. To aid in this task, I produced a Timeline of Events relating to the expert witness consultancy provided to POL. This is filed in Document WITN11080101.
5. **Professional background:**
Professor Jeff Kramer, BSc (Eng), MSc, PhD.
FREng, CEng, FACM, FCGI, FIET, FBCS, MAE.
6. I am an Emeritus Professor of Distributed Computing at Imperial College London. I was Senior Dean and Member of Council from 2009 to 2012, Dean of the Faculty of Engineering from 2006 to 2009, Head of the Department of Computing from 1999 to 2004. I have a BEng in Electrical Engineering, and an MSc and PhD in Computing.
7. I am a Fellow of the Royal Academy of Engineering, a Chartered Engineer, Fellow of the ACM, Fellow of the City and Guilds of London Institute, Fellow of the IET, Fellow of the BCS, and a Member of Academia Europaea. I was program co chair of the 21st ICSE (International Conference on Software Engineering) in Los Angeles in 1999, Chair of the Steering Committee for ICSE from 2000 to 2002, and general co-chair of ICSE 2010 in Cape Town. I was associate editor and member of the editorial board of ACM TOSEM from 1995 to 2001 and of IEEE TSE from 2003 to 2005. I was appointed Editor in Chief of IEEE TSE from January 2006 to December 2009.

8. I was awarded the 2005 ACM SIGSOFT Outstanding Research Award for significant and lasting research contributions to software engineering. In 2011 I was awarded the ACM SIGSOFT Distinguished Service Award in recognition of his significant and extensive service to the software engineering community. In February 2021 the Council of Imperial College London conferred on me the Imperial College Medal in recognition of my outstanding contributions to the life and work of Imperial College. I am currently a Visiting Professor at the National Institute of Informatics (NII) Tokyo, Japan, and a Distinguished Visiting Professor at the Chinese University of Hong Kong.
9. I have been on over 50 international conference committees in the last 15 years and have given numerous invited keynote talks at international conferences. I am co-author of books on Concurrency, Distributed Systems and Computer Networks, and the author of over 250 journal and conference publications. I have served on numerous national and international committees, advisory panels and review panels. I have also worked with many industries, including BP, BT, NATS, Fujitsu *, Barclays Capital, QinetiQ, Kodak, Microsoft and Philips, in research collaboration and/or as a consultant, and acted as an expert witness for Denton, Hall, Burgin and Warren and for Covington and Burling.

*Dealings with Fujitsu were part of a research project over 20 years before this consultancy, and so not considered a conflict of interest.

STATEMENT

10. The initial approach was to Imperial Consultants Ltd (ICON) by lawyers Cartwright King (CK) on behalf of the POL in September 2013. ICON contacted Dr. Dulay and myself as experts in the field. As indicated by the Draft version of Scope of Work POL00040040 the aim was essentially to perform a thorough investigation of the Horizon Online system and to “lay to rest the present concerns relating to the integrity of Horizon Online”.
11. ***A Phased Approach:***
As indicated in the timeline, WITN11080101, there were a number of discussions with Cartwright King (CK) and POL (with Fujitsu apparently consulted) leading to a suggested two phase approach in January 2014. Phase 1 was to focus on the so-called ‘Horizon Core Audit process (HCAP)’ that comprises a number of elements including the central audit database, Horizon branch databases, terminals at counters, plus transactions conducted with external systems. This was to be the basis of a detailed report on the rest of the system with an overall assessment of system integrity. This proposal was apparently later (March 2014) reformulated by PO lawyers Bond Dickenson (Andrew Pheasant) requesting an ‘initial review’ into Horizon to scope the work. The formal agreement (POL00210444) was eventually signed in April 2014.
12. Although not explicit, the impression for reformulating and separating the work into the revised phases (“the Initial Review”, “the Proposal” and the potential for a future “final scope of work”) was because of a reluctance to commit to the expense of the complete investigation without having some indication of our expertise and approach. Phase 1 would provide a more informed view of what would be required in Phase 2 to achieve the goals of the investigation.
13. ***Phase 1 - The Initial Review*** (POL00125569):

As indicated in the timeline, WITN11080101, prior to the preparation and completion of the Initial Review, a meeting was held at POL headquarters in May 2014 with Martin Smith (CK) and Andy Holt (POL IT). At the meeting, issues discussed included the Second Sight (SS) report, Mediation Scheme, audit trails, integrity, reliability, and case studies, with the intention to focus on technical system and procedural aspects. Concerns raised at the time included central vs local data base reconciliation and integrity. A 'shopping list' of requested documentation was produced and sent to Martin Smith [WITN11080103 and POL00204789].

14. As far as I recollect, the documentation we received whilst preparing the Initial Review consisted of some high level Fujitsu documentation (which forms some of the complete documentation received and listed in POL00318212), draft Instructions to Expert, the Second Sight (SS) interim report into alleged problems with the Horizon System, and the Draft Scope for Computer Experts (see WITN11080102).
15. Our review stated: "Can such complex systems (as Horizon) ever be determined to operate "without defect or error, securely, robustly and with integrity"? This is simply not possible. No complex system can be certified as bug (defect) free." We had therefore suggested as follows: "How then should an investigation into the integrity of Horizon proceed? The aim should be to provide a report on the extent to which the system is fit for purpose, supports integrity and robustness, and facilitates maintenance and upgrade. "

We then indicated how we intended to go about this in Phase 2 of the project, the necessary organisation and steps required, and an indication of the documentation required.

16. As I recall, the impression was that the Phase 1 Initial Review was accepted. At a roundtable meeting on 19th August 2014 at POL HK we discussed our Phase 2 proposal which was roughly articulated by POL as "Can we argue that Horizon is fundamentally sound".
17. **Phase 2 - The Proposed Workplan:**

The work commissioned thereafter was essentially the Phase 2 work we had described. This was to include branch counter training/systems familiarization, meetings with Fujitsu to gain a greater understanding of the architecture and workings of the Horizon Online system and complete access to system documentation as required. This was to include the potential to run tests and explore case studies, with particular interest on the auditing system. As far as we understood, the Phase 2 work plan would meet the objectives of POL.

18. **Phase 2 – Meetings at POL HK and Fujitsu:**

As indicated in the timeline, WITN11080101, a branch counter training session/systems familiarisation session was held at POLHK on 22nd September 2014, and meetings were held at Fujitsu in Bracknell on 15th October and 27th November 2014.

19. The training session provided us with good insight into the task of Branch Managers and the system,

indicating that Horizon Online appeared to provide the required functionality but with the following potential issues: Was there sufficient training for subbranch managers; the interface appeared to us adequate but rather clumsy and prone to errors of use; possible interference between terminals; the need to distinguish mistakes (forgetting end of transaction, merging two, ...) versus evidence of fraud; and when discrepancies occur, it there appeared to be little or no guidance at training on how to resolve these.

20. At the meetings at Fujitsu, presentations and discussions were on the following topics, with some topics remaining to be clarified and further details to be provided

- High level design/architecture, change and support processes, audit system, processes and standards.
- Basket of actions; completion of basket to central system; reversal if fails.
- Audit requests from PO if fraud suspected.
- Review of counter software; basket scenarios; reversals and recovery; SS bugs and bug handling; update scenarios; testing and maintenance; some dispute cases.
- Some issues raised concerned recovery flag set when not completed, even though receipt issued?
- Recovery process varies depending on service to bring system into consistency (area of concern with PO branch managers).
- Audit trail consistency and reversals?
- Recovery?

21. **Phase 2 – Documentation:**

As indicated in the timeline, WITN11080101, there was initially some reluctance by Fujitsu (James Davidson) to provide us with all requested documentation (see meeting of 15th October) though we were subsequently reassured by Andy Holt of POL that this would be forthcoming. Some Horizon Architecture documentation was sent by James Davidson of Fujitsu to us in November. At the meeting in November at Fujitsu, James indicated that he had the intention to set up some form of secure file sharing facility for the documentation. However, this was never done, and we never obtained satisfactory access to the required documentation.

22. **Phase 2 - Views and Opinions:**

No written views or opinions on the integrity of the Horizon Online IT were produced by us. However, at meetings our views were expressed in our discussions which raised questions and issues and requests for further documentation. Some of these that I recall are mentioned above in the meetings section 20.

23. **Phase 2 – Dissatisfaction and Independence:**

To the best of my knowledge and recall, at no point did POL, CK, Fujitsu or their representatives express any dissatisfaction with our work or our views.

24. Other than the seeming reluctance to provide us with the requested documentation, our independence was never challenged.

25. Phase 2 – Project termination :

After a frustrating period (November 2014 to July 2015– see timeline WITN11080101) during which no progress was made while we awaited access to further documentation and for continued discussions with Fujitsu, a meeting with POL was arranged for 29th July 2015 at POL HK. We were asked to indicate the list of documents to which we had been given access [ref POL00318212 and POL00318159]. The email message from Martin Smith to POL [ref POL00318211] seems to confirm the POL intention to continue with Phase 2 of the project, though the email of Rodric Williams [ref PL00318159] does indicate some irritation on the part of the POL lawyers with the lack of further progress.

26. At this meeting we verbally summarized the state of the work and gave a preliminary view that we were not yet in a position to indicate whether or not the Horizon system was robust and sound, nor whether or not problems had been properly dealt with. We stated that, after such a long break, we needed to refresh our familiarisation with the system; that we only had some of the documentation required and that we still needed convenient access to a documentation “vault” with the rest of the documentation in order to continue .

27. A decision was made (or appeared to have been made) to continue with Phase 2. We were subsequently informed by Martin Smith (CK) that he thought the meeting was constructive and understood that the POL were considering the issues raised.

28. No further feedback or response from POL was ever received.

29. Final Comments:

It remains unclear to me exactly ...

1. why we were never given full access to the documentation ;
2. why a shared file system (“vault”) was never set up ;
3. why the hiatus for the first half of 2015;
4. why in June 2015 POL seemed keen to meet, and yet after what appeared to be a constructive meeting on the 29th July 2015 at which it appeared that they wanted to continue with Phase 2 of the project, no further communication or interaction took place.

I have my suspicions but do not know for sure. The Non-Disclosure agreement with the POL (WITN11080104) was never signed by the POL.

Statement of Truth

I believe the content of this statement to be true.

Signed:

GRO _____

Dated: 13th August 2024 _____

Index to First Witness Statement of Jeffrey Kramer

| No. | URN | Document Description | Control Number |
|------------|--------------|--|-----------------------|
| 1 | WITN11080101 | Timeline of Post Office Ltd engagement with Imperial College London | WITN11080101 |
| 3 | POL00210444 | Agreement to appoint expert | POL-BSFF-0048507 |
| 4 | POL00125569 | Initial Review: Proposal for investigation into the integrity of the Post Office Horizon Online accounting system | POL-0130687 |
| 5 | WITN11080102 | <i>draft</i> Instructions – IC Consultants Ltd. (9 th May 2014) | WITN11080102 |
| 6 | POL00204789 | Email from Paul Cray to Martin Smith and others re Document List for Post Office Horizon Expert Witness Engagement | POL-BSFF-0042852 |
| 7 | WITN11080103 | 'shopping list' of documentation and information requested (16th May 2014) | WITN11080103 |
| 8 | POL00318212 | List of Fujitsu documentation received | POL-BSFF-0156262 |
| 9 | POL00318159 | Email from Jessica Madron to Rodric Williams re: Meeting with experts on 14th July | POL-BSFF-0156209 |
| 10 | POL00318211 | Email from Martin Smith to Rodric Williams, Jessica Madron, Simon Clarke and other RE: Meeting with the Experts on 29th July 2015 at 11 a.m. | POL-BSFF-0156261 |
| 11 | POL00318159 | Email from Jessica Madron to Rodric Williams re: Meeting with experts on 14th July | POL-BSFF-0156209 |
| 12 | WITN11080104 | Non-Disclosure Agreement: Post Office Ltd and Professor Kramer | WITN11080104 |