THE EVOLUTION OF CYBERCRIME:

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IS THE EMAIL OF THE SPECIES STILL MORE DEADLIER THAN THE MAIL

"Cybercrime and Digital evidence" Conference at the Faculty of Law, Ljubljana, Slovenia

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WHERE I AM FROM


University of Leeds


The New Law Building

A brief synopsis of my talk – N.B. The title paraphrases Rudyard Kipling's poem “Female of the Species” (is more deadlier than the male).

- Most cybercrime offenders find their victims through emails – respondents reply to content or unintentionally download a virus from an attachment. *Email replaced the mail used by fraudsters.*
- In recent years the increased volume of personal and corporate commercial traffic online has raised the value that can be stolen, which has triggered more sophisticated forms of victimisation.
- Viral attachments are being replaced by links to toxic websites from which recipients unintentionally download malicious software – usually via a flaw in their browser software.
- Email is still a major source of infection, but not solely, some websites of reputable retailers have, for example, been compromised so that visitors become infected when visiting them.
- Email is still more deadly than the mail, but things are changing.

Outline – the key questions to answer

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PART 1 How has networked technology transformed criminal behaviour?

PART 2 What recent developments in cybercrimes are continuing to challenge criminal justice systems. Two examples.

PART 3 What developments in networked technology could initiate future online crime.

PART 4 How do we regulate Cybercrimes?

PART 1 How has networked technology transformed criminal behaviour?

- **It creates cybercrimes – they are different to conventional crime (spatial, temporal, jurisdictional)**
- **Network technologies <u>change the nature of the organisation of crime</u> – They are force multipliers**

a) **One person can control the criminal process**

b) **They give access to victims across networks**

c) **They give access to victims across a global span**

d) **They make criminal activity more efficient**

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b) 50 million €1 micro-robberies

- Much less complex - Needs one person, a networked computer, specialist malware (trojan/ SQL) + many good ideas – low risk / very high return on investment

BUT how do we make sense of different accounts of what cybercrime is/ what cybercrimes are?

There exist conflicting accounts of cybercrime:

A) *In terms of their level of prevalence*

- **1.5m-3m threats in 2008 alone (Symantec/Sophos) YET only**
- **200 prosecutions under Computer Misuse Laws in 20 years.**

B) *In terms what they are* i) hacking, DDOS ii) frauds, scams iii) pornography, hate speech ??

C) *In terms the level of activity they take place at*: personal, corporate, national/ international security concerns

We tend to over-problematise the internet and mis-understand the problem. How do we make sense of different accounts of cybercrime?

Making sense of different accounts of

- "Everyone agrees that cybercrimes exist but they do not all agree on what they are!"
- Cybercrimes, like cyberspace, are informational, networked and globalized
- Cybercrimes make sense if we view them as mediated by networked computers and not just computers.
- We can understand cybercrimes more clearly if we apply an elimination test - e.g., just think about what is left after the Internet has been removed from the equation.

Evolutionary/ Generational differences in level of mediation by technology

- **Traditional crime (initially mainframes – 1st generation) cybercrime within discrete computing systems b) to assist traditional crime – information, communications**
- **Hybrid cybercrime (dial-in modems – 2nd generation) - across networked computing systems (hacking across networks) - new opportunities for traditional crimes**
- **True cybercrime *(Sui Generis)* (broadband - 3rd gen.) - new forms of harm** - Spams, Piracy, Phishing, making Botnets

True Cybercrimes are networked, distributed, and automated (spam driven cybercrime – 'phishing') moving towards complete mediation by networked technologies (eg., 'phishing' into 'pharming'). (See further Wall, 2007)

Accounting for different types of cybercrime

Three generic groups of cybercrime (Wall, 2007)

- **Integrity related cybercrime** – Hacking and cracking, DDOS
- **Computer assisted cybercrime** – Virtual bank robbery: Exploiting financial and billing systems online
- **Content related cybercrime** – Online obscenity (extreme pornography), violent or harmful content, Offensive communications, email, chatrooms/ blogging

These three groups are unlikely to change – just the content

BUT THE MEANS OF VICTIMISATION WILL CHANGE.

PART 2 What recent cybercrime developments are challenging criminal justice systems

- **New (financial) crime motivations** – increase in proportion to the amount of money available. Has been a rapid increase in volume of personal and commercial financial internet traffic. Drives the third generation of criminal activity mentioned earlier.
- **New forms of organisation of crime online**
- **Sophisticated 'Crimeware as a service'** being offered to create and deliver malicious software.
  - **Email attachments are still prevalent but more dangerous**.
  - **Use of toxic websites to launch drive-by downloads** (malicious software) directly into browsers (exploiting flaws).

SEE FOLLOWING EXAMPLES - a) Crime Organisation online b) toxic www sites/ evolution of phishing

EXAMPLE ai) KNOWN 'BRANDED' ORGANISED CRIME GANGS

***Superzonda* – spammers - based in South America, specialize in creating and disseminating spam.**

***The Hangup Team* –** (red-and-black swastika shooting out lightning bolts) a Russian gang that 'SecureWorks' claims develops malware for sale to hackers. The group is believed to be still in operation creating malware. Use Coreflood and the Trojan Backdoor.Win32.Padodor.w to develop botnets. (three folk from Russia. Arrested 2000. Back in action with links to the spamming industry which uses their botnets as spamming platforms.

***Shadowcrew* - (Operation Firewall 2004/5)** the ShadowCrew, a gang dedicated to identity theft, bank account pillage, and the fencing stolen goods on the WWW. Did not meet. No need. Surveilled online.

The Rock Phish gang – a most notorious phishing gang – reinvented itself

***Drink or Die* – distributes Warez –** Claimed no profit .. but highly organized and security-conscious. Cracked new software and released it

Carder Planet and Darkprofits – facility for selling credit card details

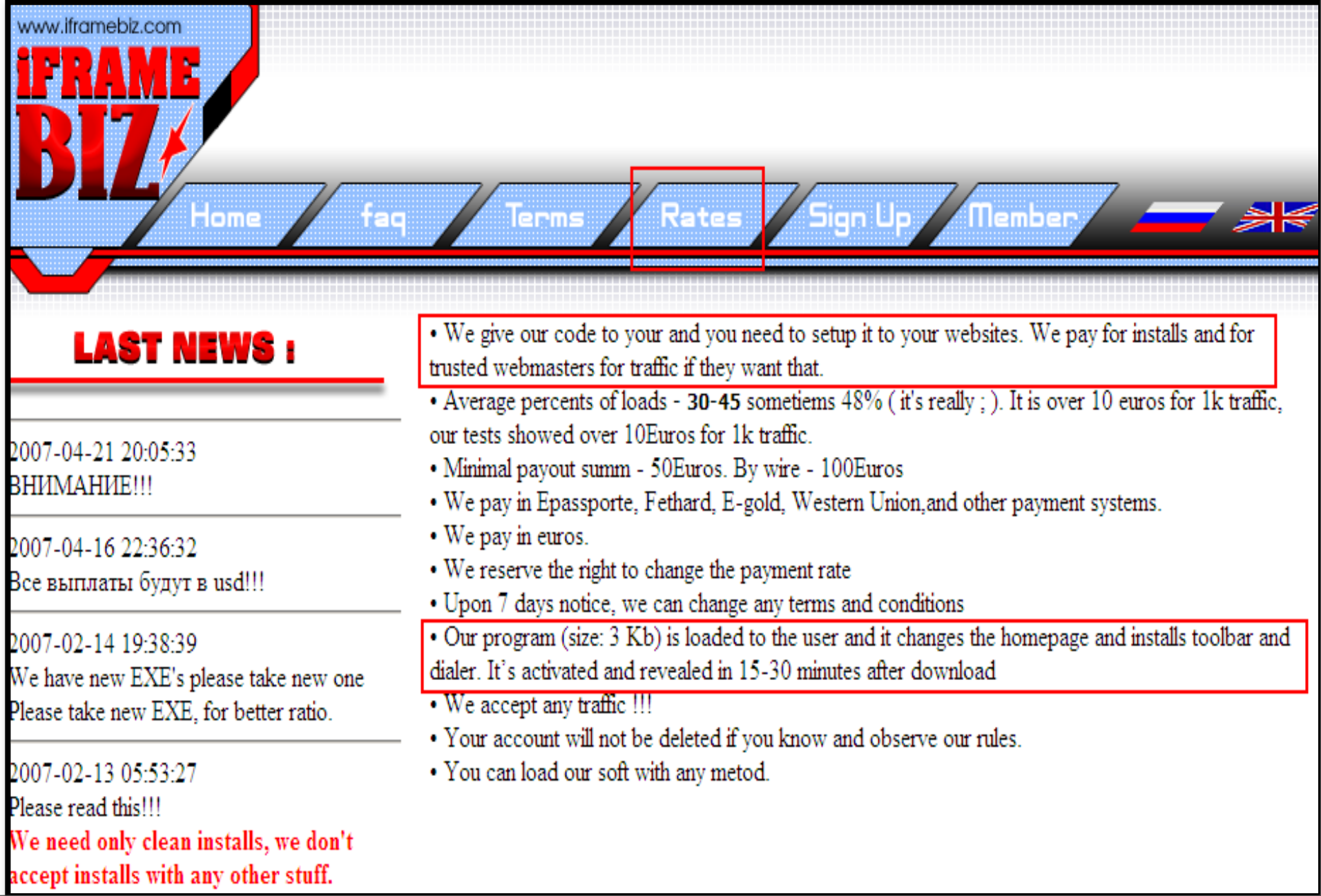
***Rustock, Warezov, Blackcarder*, Storm Worm Gang, Celebrity Spam Gang –** all control botnets

The Russian Business Network – drive-by downloads

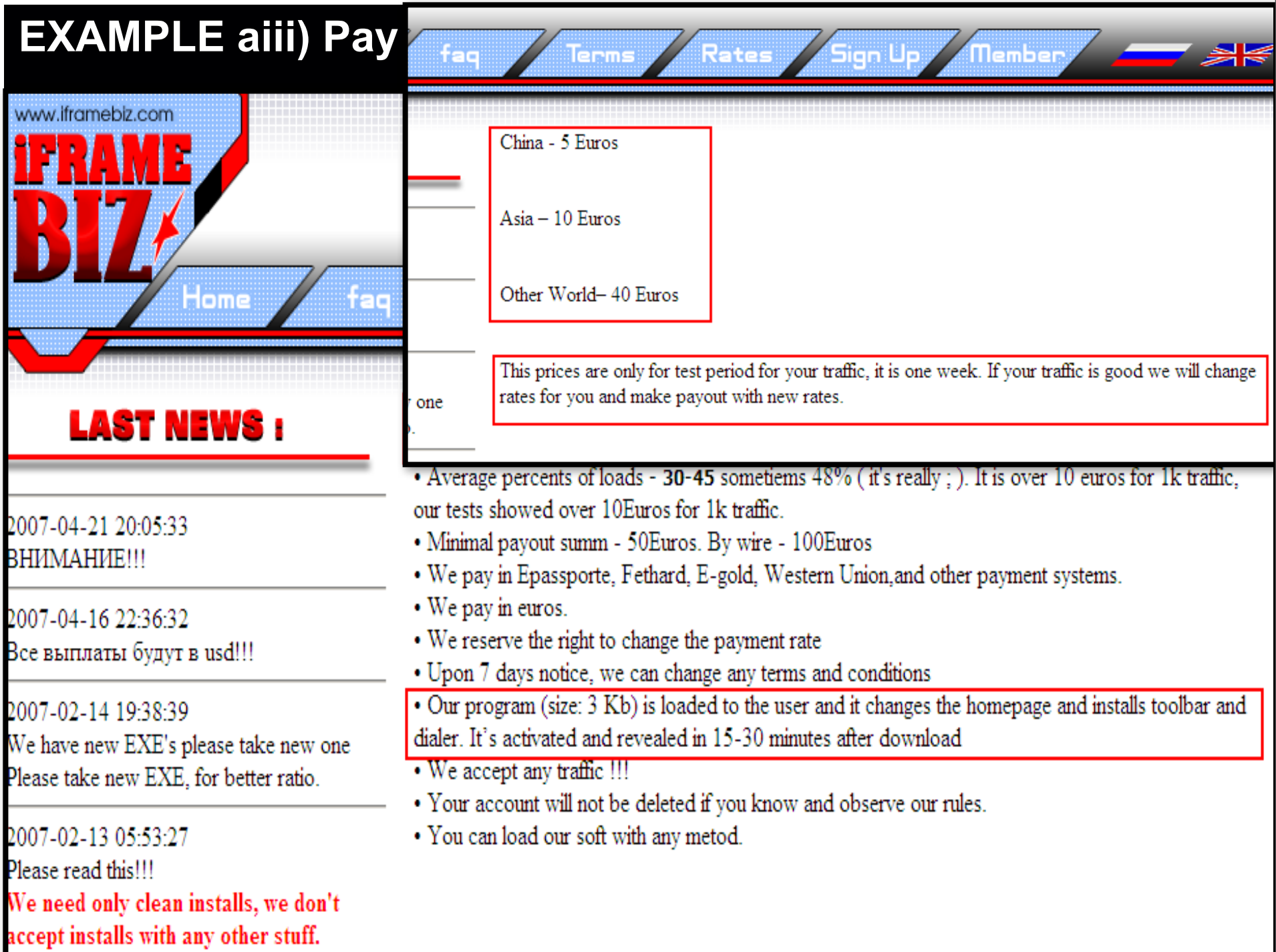
EXAMPLE aii) What do we know about cybercrime gangs? - analysis of known gangs

- They are mainly ephemeral – project based
- They are self-contained - more like cottage industries
- Just because they are Russian or Eastern European in origin or are based upon servers is not evidence of links to traditional organised crime – which is a big concern
- The new technologies are cheap and only require knowledge to implement and use – little start up cost
- They do not carry the hallmarks of traditional organised crime but … a) criminal wealth accumulates b) aspects can be useful to OC

EXAMPLE aiii) Pay per infection models – to create botnets



EXAMPLE aiii) Pay



Example b *The evolution of Identity Theft*

The object of Phishing is to get victims to log onto fake www site or ring fake bank number to give personal financial information than can be used to defraud them later.

- **Trashing** (raiding rubbish bins for personal documents)
- **Phishing** (sending fake bank emails asking for information)
- **SMiShing** (Phishing using SMS texting)
- **Vishing** (Phishing using VOIP)
- **Pharming** (automatic switch to fake bank www site)
- **Spear-Phishing /**Super-spoofing – (May2008+) adds to original screen to siphon additional information **SEE NEXT - Makes fraud very personal again – account take over**

a) How are reputations restored b) is sleeper fraud a problem?

Example bi: Traditional Phishing Email

26/1/09

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Dear HSBC Customer,

Your Internet Banking security code was entered incorrectly more than 3 times.
For the protection of your account we have suspended access to it.
To restore access please Log In correctly.
Previous notifications have been sent.

Thank you for choosing HSBC Bank.

Example bii - Spear Phishing – from slide by Finjan

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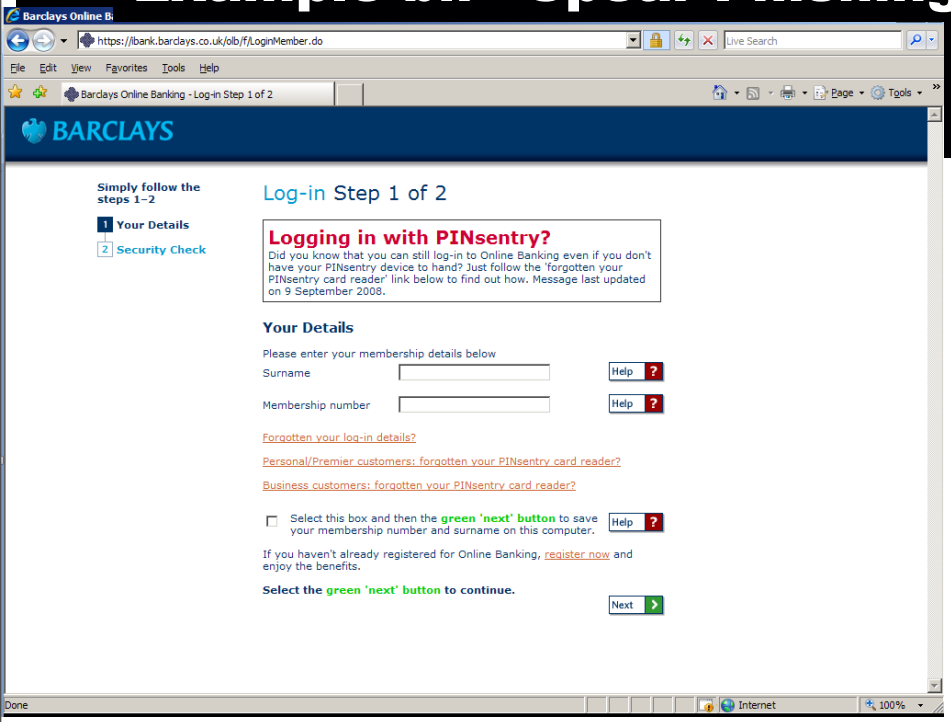

Viewed on a clean PC

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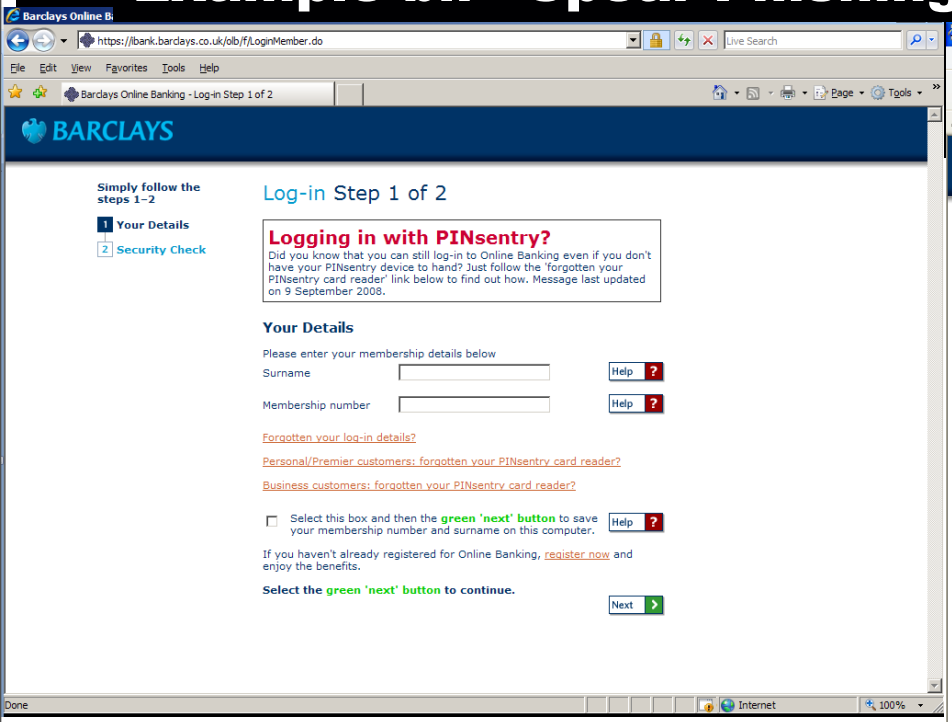

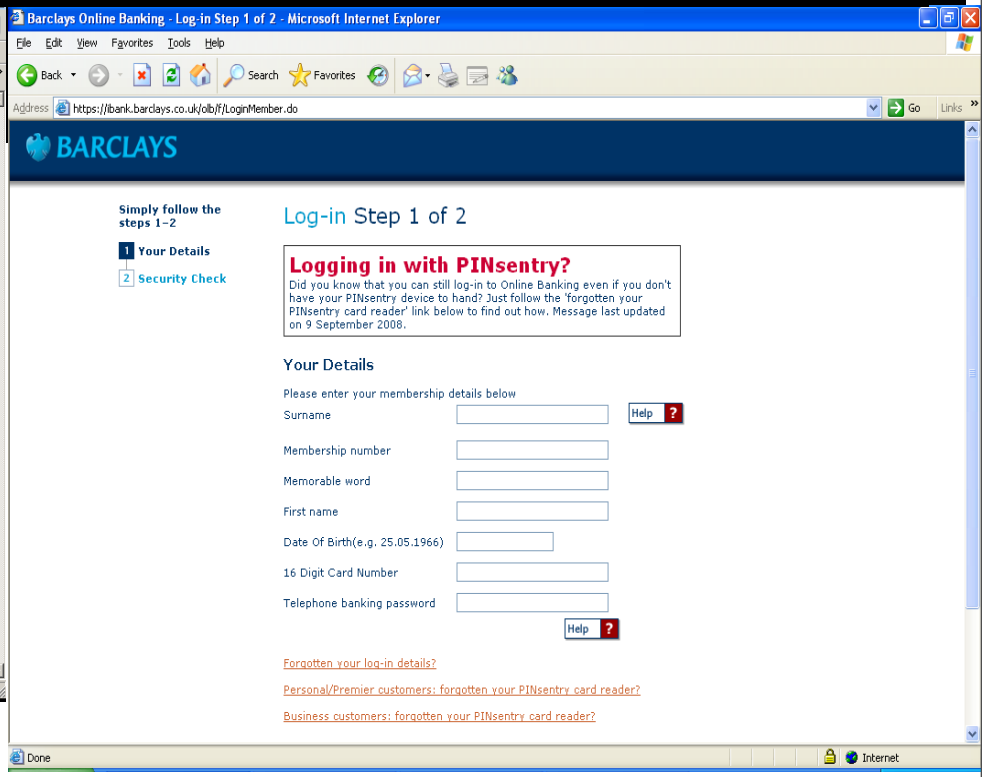

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Viewed on an infected PC

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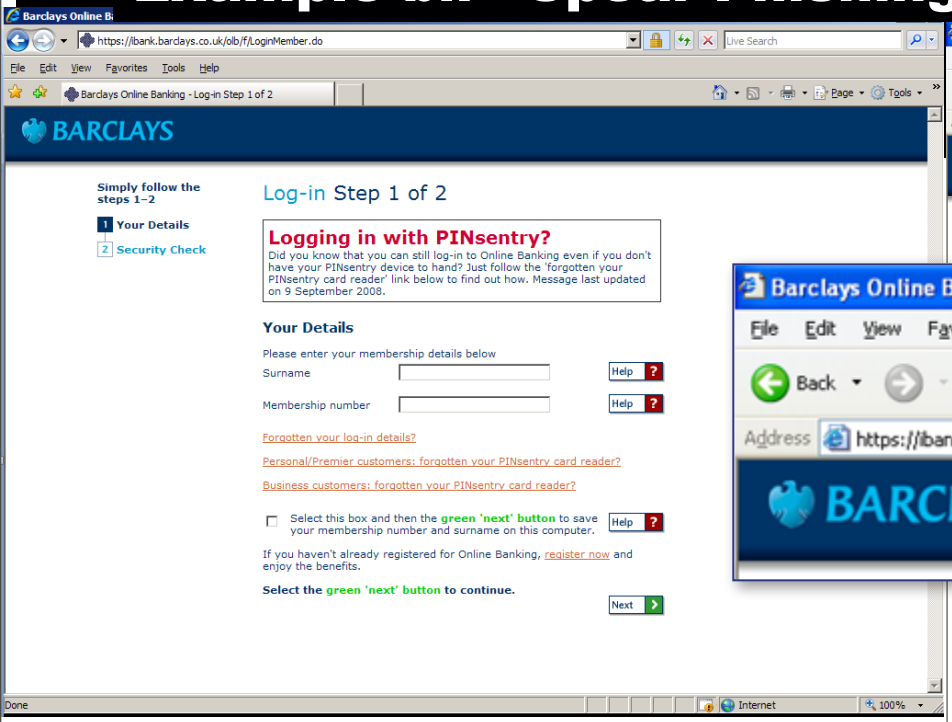

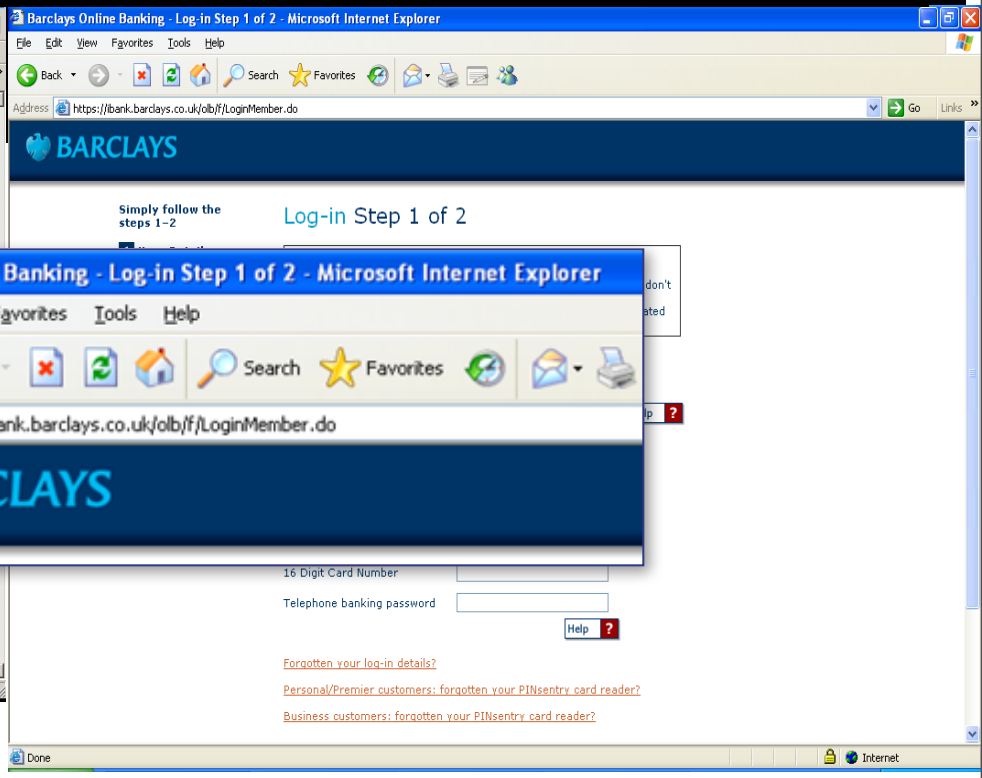

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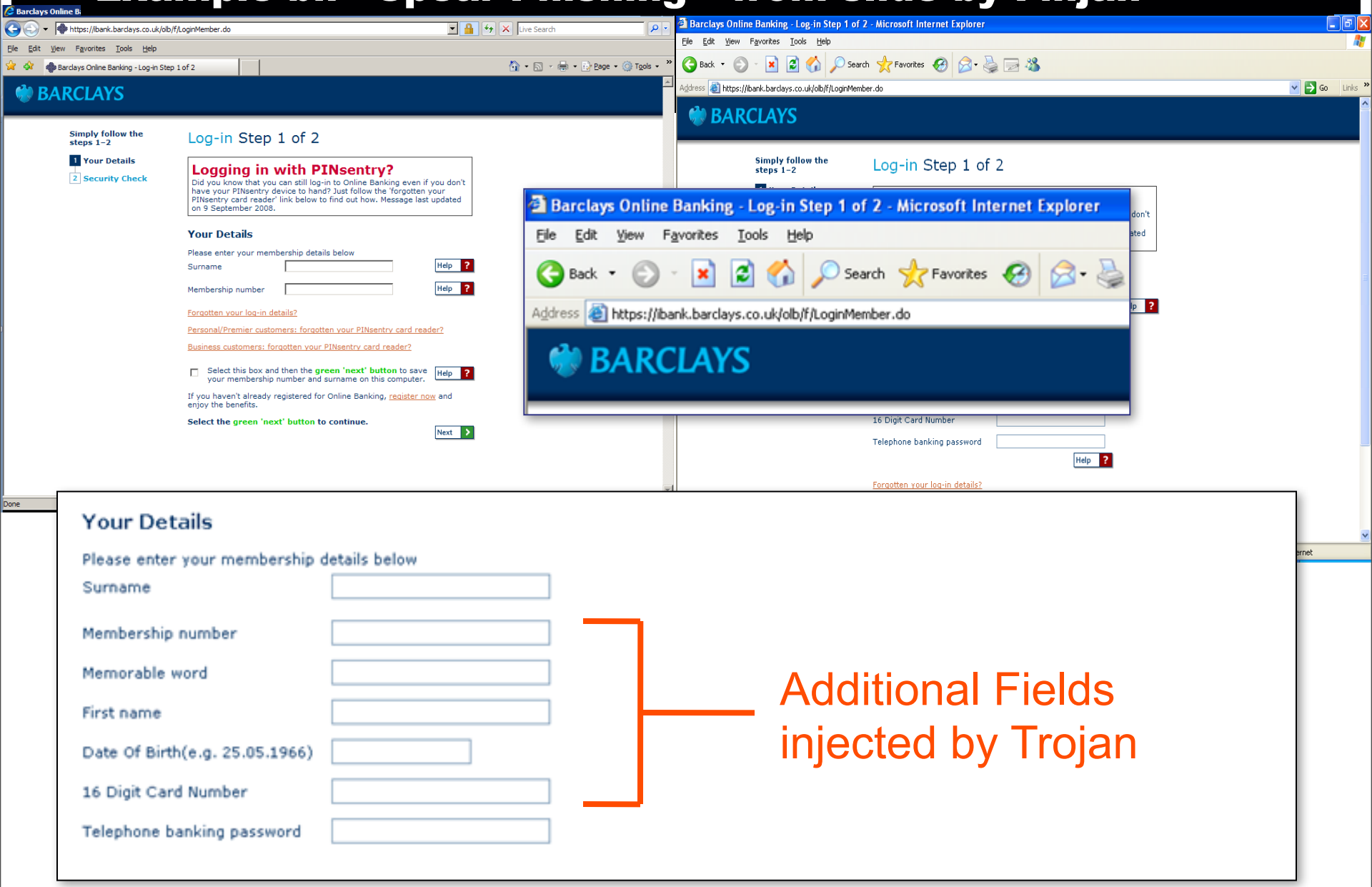

Your Details

Please enter your membership details below

Surname

Membership number

Memorable word

First name

Date Of Birth(e.g. 25.05.1966)

16 Digit Card Number

Telephone banking password

Additional Fields injected by Trojan

Example biv - Phishing Has Evolved

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- The Trojan infects and then waits for the victim to visit his or her bank – uses code obfuscation to get through AV software
- Information is gathered by injecting additional fields into the genuine bank web page as it loads in the browser
- No fake web sites – changes the way bank site is viewed
- The SSL connection between client and bank is valid (padlock is shown and certificate chain is OK)
- Anti-virus software did not detect this threat
- Organisations that fail to evolve risk becoming victims of information theft
- This evolutionary force will continue a) with new technology b) offender need to use new tactics to trick victims

PART 3 What developments in networked

- **New convergences of technology will continually create new opportunities for crime**
  - **the inventors of the computer and telephone did not forsee their convergence as the internet! Nor of criminal opportunities arising**
  - **Neither did inventors of phones and cameras!**
  - **Ambient technologies via new generations of RFIDs may spawn the fourth generation of cybercrimes.**
- **Criminal motivations will rise along with the stakes**
  - **see the case of the magic swords (valuable intellectual properties created online).**
- **New forms of crime organisation online will prevail.** But …
  - **They will be organised more along the pro-sumption (participatory consumption) model.**
  - **Interestingly, they are anti 'command and control'/mafia in that a) they do not require massive start up costs b) they can operate independently/ secretly c) th**ey don't need protection

PART 4 How do we regulate Cybercrimes?

- The same technologies that cause the crimes also can be used to police and prevent them.
- We need to clarify the relationship between Law and Technology - once law becomes embedded in code it can lead to ubiquitous law enforcement ("aware of everything but itself and its own blind spots and biases" Adorno)
- Primary legislation could contain rules for establishing principles and standards for technological interventions.
- We need to be careful of a shift from a justice society to a control society where justice is replaced by risk assessment of potential criminalty based upon simulations of crime.
- We need to establish a common framework of accountability that accommodates conflicting Public v Private interests

References

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Wall, D.S. (2007) *Cybercrimes: The transformation of crime in the information age*, Cambridge: Polity. ISBN 0745627358.