Buyer Fraudulence in Peer-to-Peer eCommerce: Building Tools for Alleviation

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April 29th, 2014
What is Peer-to-Peer eCommerce?

- P2P
  - Decentralized network,
  - Nodes are both suppliers and consumers of resources
- C2C - Consumer to Consumer
- In this Study:
What type of Fraudulence are we dealing with?

- **Buyer fraudulence**, as opposed to **seller fraudulence**
  - Email Spoofs
    - Fake PayPal
    - Fake Ebay
    - Fake Wire Transfer or Bank
  - “Stories” through Email or Text Message
Dear Benjamin Horne (bdh.research@yahoo.com)

We wish to inform you that PayPal just contacted us on your payment approval, to transfer your payment of $4,547.99 USD which was paid for by Mrs Elizabeth Garcia. We want to inform you that this payment has been verified and confirmed by us with PayPal, and we advise you should go ahead and carry out the shipment of your item to your buyer’s given destination and keep us updated as soon as you carry out the shipment.

<table>
<thead>
<tr>
<th>Item no.</th>
<th>Description</th>
<th>Quantity</th>
<th>Price</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>271420908616</td>
<td>Apple iMac 21.5&quot; Desktop (May, 2011) - Customized</td>
<td>1</td>
<td>$3,547.99</td>
<td>$3,547.99</td>
</tr>
</tbody>
</table>

Subtotal: $3,547.99
Standard Int'l Shipping: $100.00
Total: $4,547.99 USD

We want to also bring to your notice that we have already taken full guarantee on this transaction and be informed that the item is ready for shipment. The PayPal Escrow will be closed.

Why does this matter to you?

1. **eCommerce auction scams**: WSJ Top 10 biggest scams of 2013 list
2. Users frustrated with fraud on eBay since its inception, yet, very little has changed.
3. It could be you!
eBay has tried…

- Reputation/Feedback System
- Established Trust and Safety Department
- Awareness Initiatives
- Top-Rated Seller Schemes
- Constant Revision of Polices and User Agreements
- Paypal Money Delays
What has been proposed?

- Anomaly detection schemes
- Data mining schemes
- Agents based-trust management schemes
- Social Network Analysis and Classification Tree Approaches
- Additions to the Reputation System
- Conceptually formalized
Questions Proposed

- What are the traits and commonalities of typical buyer fraudulence?
- Can a simple third party tool be built to alleviate common buyer fraudulence based on this data?
Methodologies

- Selling data collected during a 9 week period
- Specific 1 Week Selling test
- Literature Review and Comparison of Data
- Built a tool based on this data
Salient Findings (9 week test)

Correlations hard to find with such a small, yet, broad dataset.

Based on some sale demographics, the correlation between fraud, electronics, and price was found.

Consistent with other literature
Mrs Elizabeth Garcia Paid Through PayPal

Dear Benjamin Horne

Mrs Elizabeth Garcia
Mrs Elizabeth Garcia (garciaelizabeth402@yahoo.com) sent you an Instant Payment for an eBay item through PayPal.

In regards of this please remember to email me the tracking number and also to PayPal today immediately this item has been shipped and do handle the item with care when sending.

Thanks and Regards

On Monday, March 10, 2014 1:33 PM, eBay <ebay@eBay.com> wrote:

eBay sent this message to Elizabeth Garcia (elizgarc_hqhwetkqi).
Your registered name is included to show this message originated from eBay. Learn more.

Invoice

Dear elizgarc_hqhwetkqi,

Thank you for shopping on eBay! Your total amount due is $3,617.78. More details about your purchase are included below.

<table>
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</tbody>
</table>

Subtotal: $3,547.99
Shipping and handling via UPS Ground: $69.79
Total: $3,617.78
Salient Findings (Keywords)
FRAUDFINDER
THE STATISTICAL SCAM FILTER
What is FraudFindr?

- **Web application** built to **check** peer-to-peer eCommerce transactions for **fraudulent** or deceptive **behavior**
- Built with **end users** in mind
- Simple **Copy** and **Paste** Interface
- **HTML, CSS3, JavaScript, JQuery (Vegas and Reveal), PHP**
How does is FraudFindr find fraud?

- Checks:
  - Full Email Headers
  - Email Bodies
  - Text Messages

- Checks Additional Information about Transaction
Full Email Headers

- Parses input
- Finds return path
- Compares email in return path to list of good domains
- User’s can add specific domains such as their bank
Email Body and Text Messages

- **Keywords**
  - Search parsed input for common keywords found in emails and text messages
  - Evenly distributed weight
  - Weight added to “give-a-way” words

- **Phrases**
  - Same Process, but all weights are evenly distributed
Email Body and Text Messages

“Haste” Words

- Algorithm Checks for duplicates of words were duplicates make the document more relevant.
- Relevance is **not proportional** to Frequency
- Increment by Log base 3 of frequency + 1
FRAUDFINDR
THE STATISTICAL SCAM FILTER
DEMO
Future Work

- Full Implementation of the **Bag of Words Model**
- Full **Responsive** and Mobile Design
- Continued Tested and **Accuracy Updates**
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