ScamMagnifier:
Detecting and Analyzing Fraudulent Shopping Websites

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Muhammad Saad , Gail-Joon Ahn, Ruoyu Wang, Tiffany Bao, Yan Shoshitaishvili, Adam Doupé

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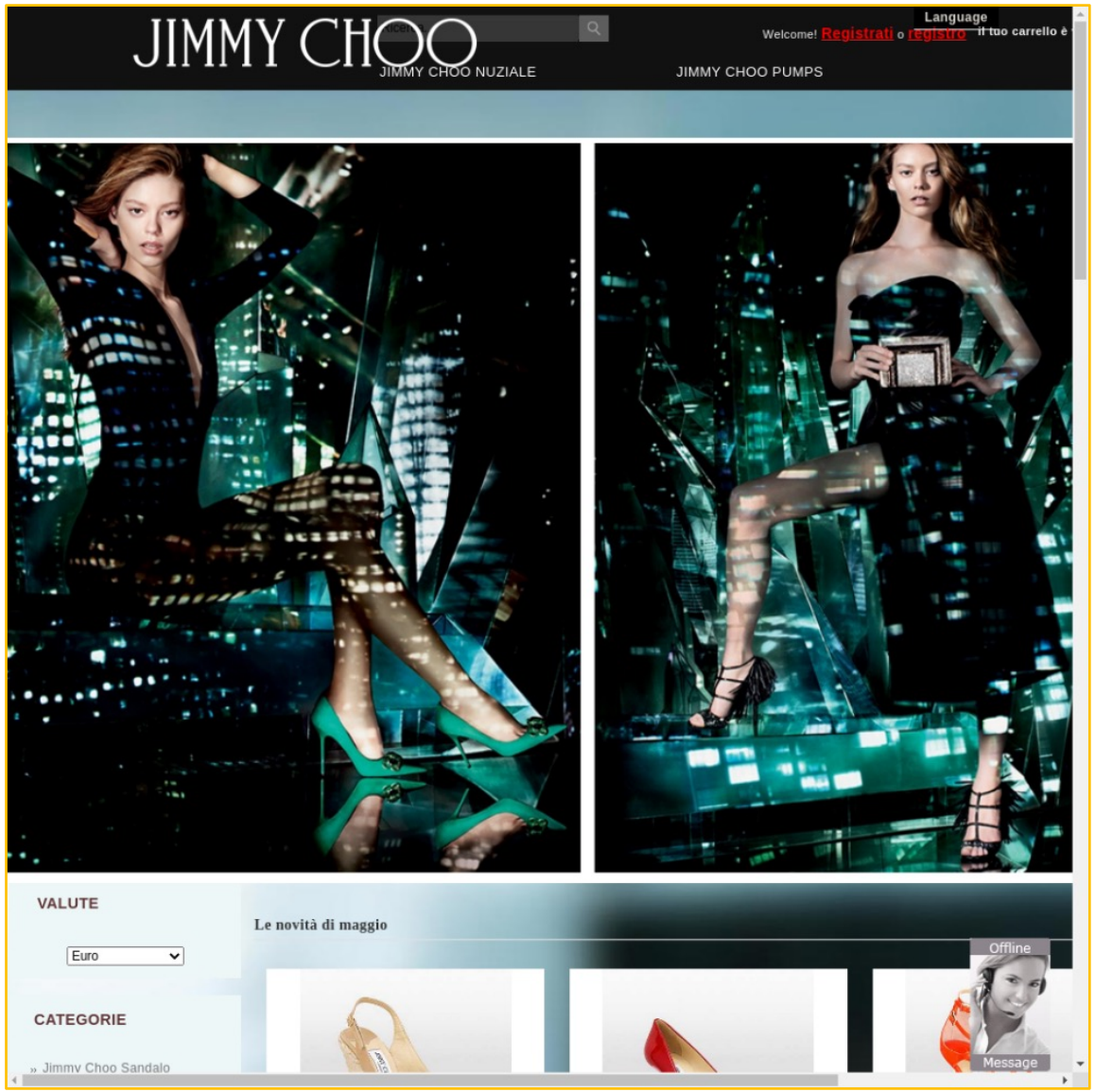
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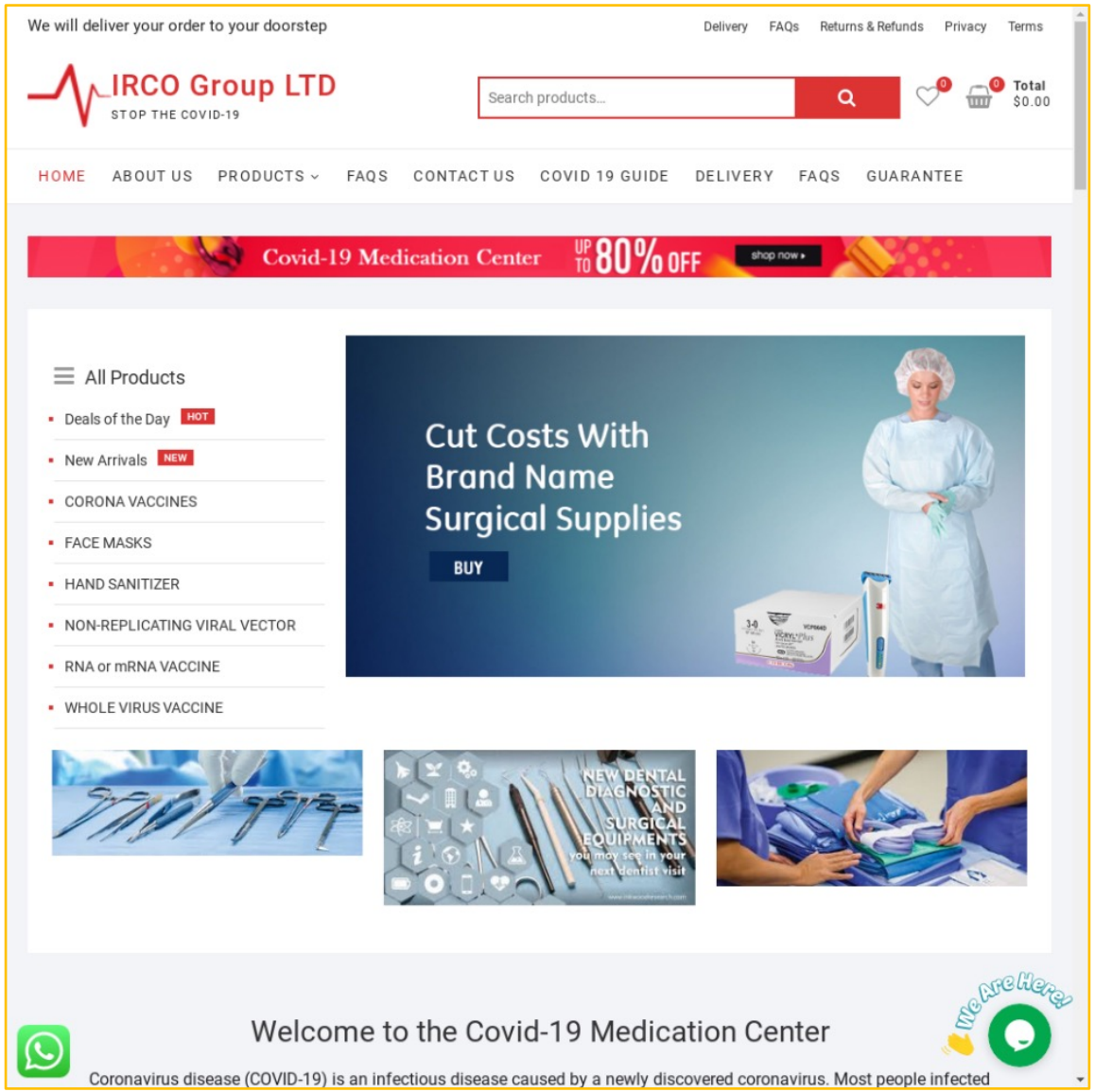
Message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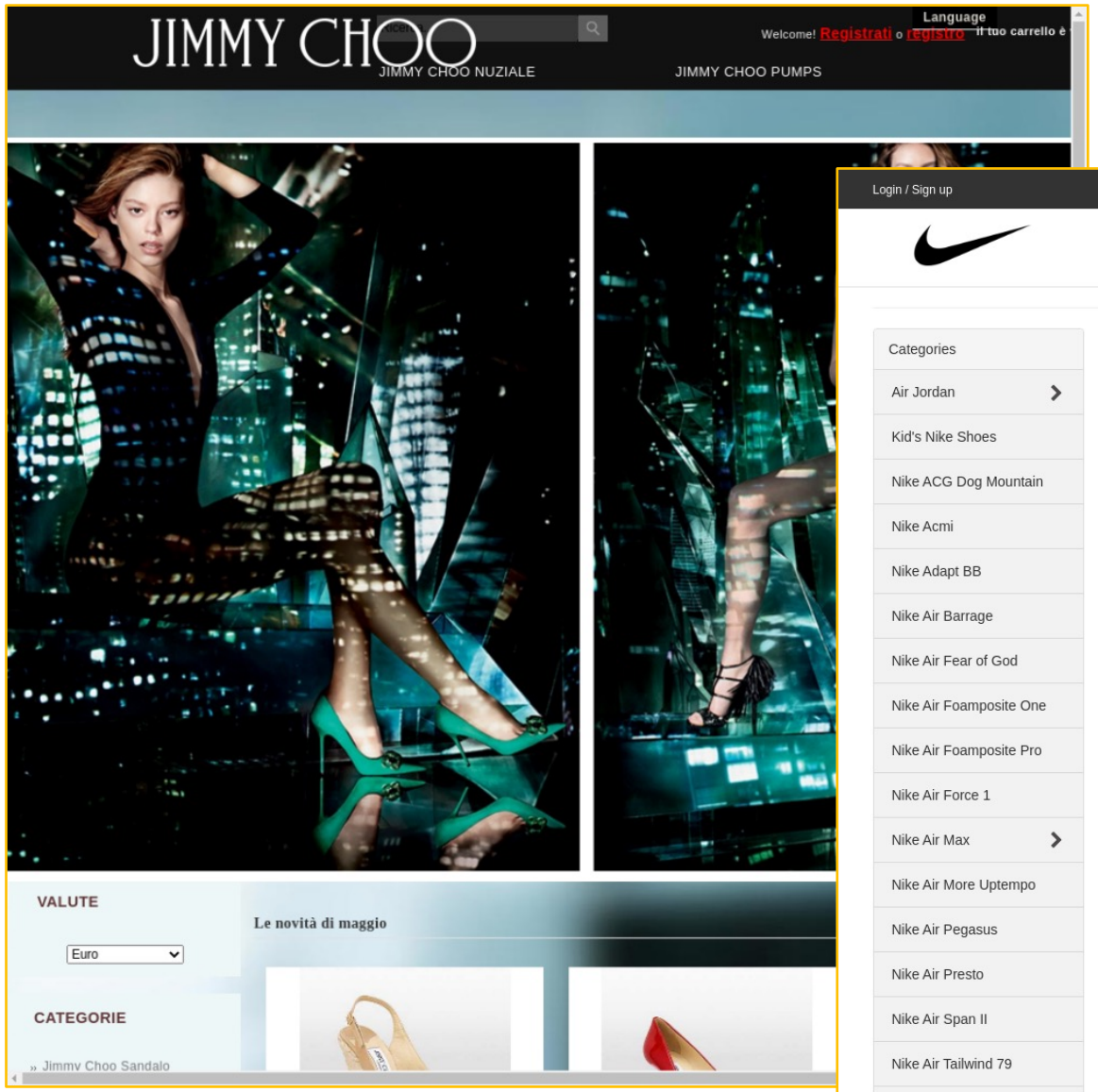
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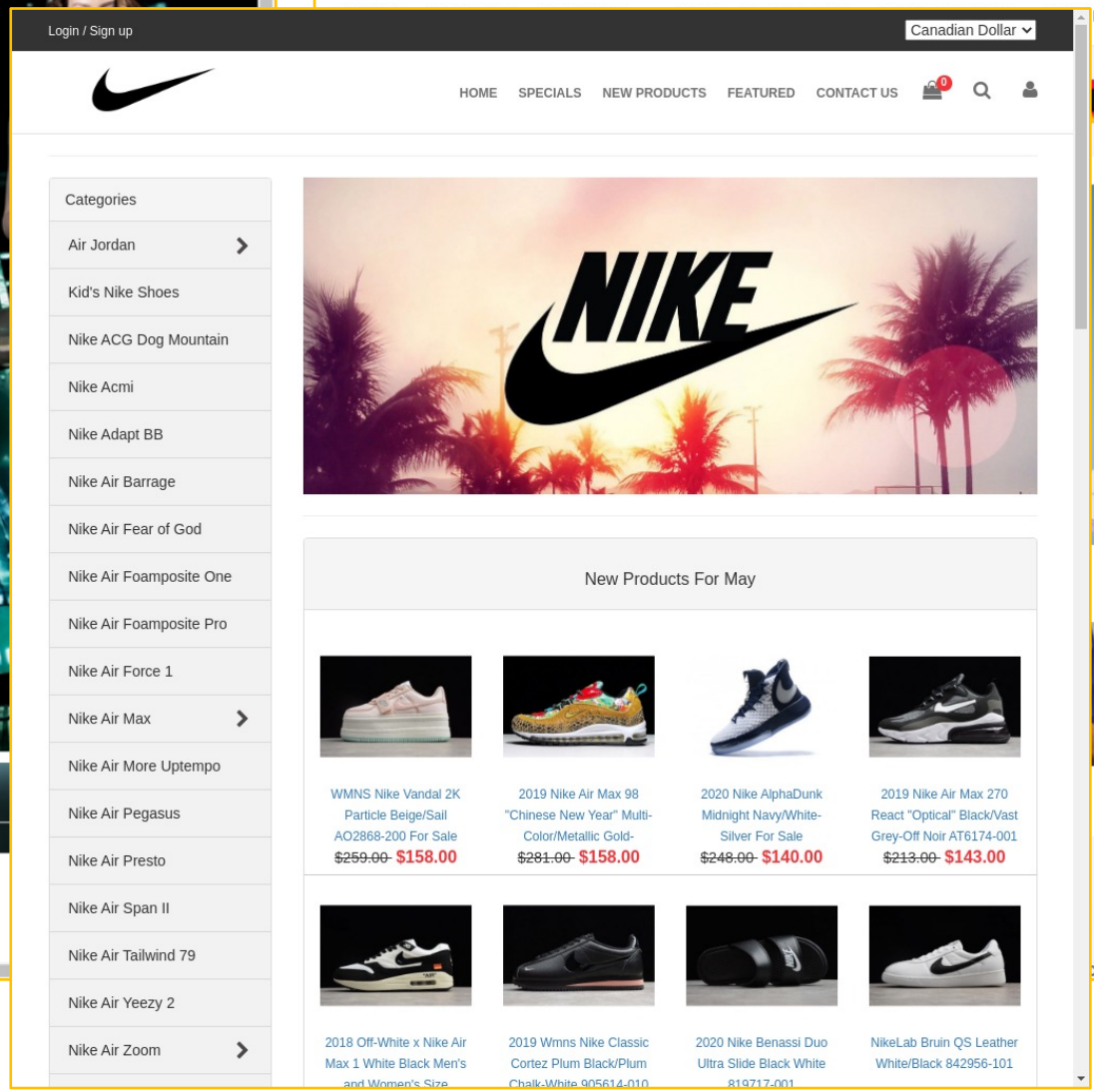
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Nike Acmi
Nike Adapt BB
Nike Air Barrage
Nike Air Fear of God
Nike Air Foamposite One
Nike Air Foamposite Pro
Nike Air Force 1
Nike Air Max
Nike Air More Uptempo
Nike Air Pegasus
Nike Air Presto
Nike Air Span II
Nike Air Tailwind 79
Nike Air Yeezy 2
Nike Air Zoom
NIKE
New Products For May
WMNS Nike Vandal 2K Particle Beige/Sail AO2868-200 For Sale
$259.00 $158.00
2019 Nike Air Max 98 "Chinese New Year" Multi-Color/Metallic Gold-
$281.00 $158.00
2020 Nike AlphaDunk Midnight Navy/White-Silver For Sale
$248.00 $140.00
2019 Nike Air Max 270 React "Optical" Black/Vast Grey-Off Noir AT6174-001
$213.00 $143.00
2018 Off-White x Nike Air Max 1 White Black Men's and Women's Size
2019 Wmns Nike Classic Cortez Plum Black/Plum Chalk-White 905614-010
2020 Nike Benassi Duo Ultra Slide Black White 819717-001
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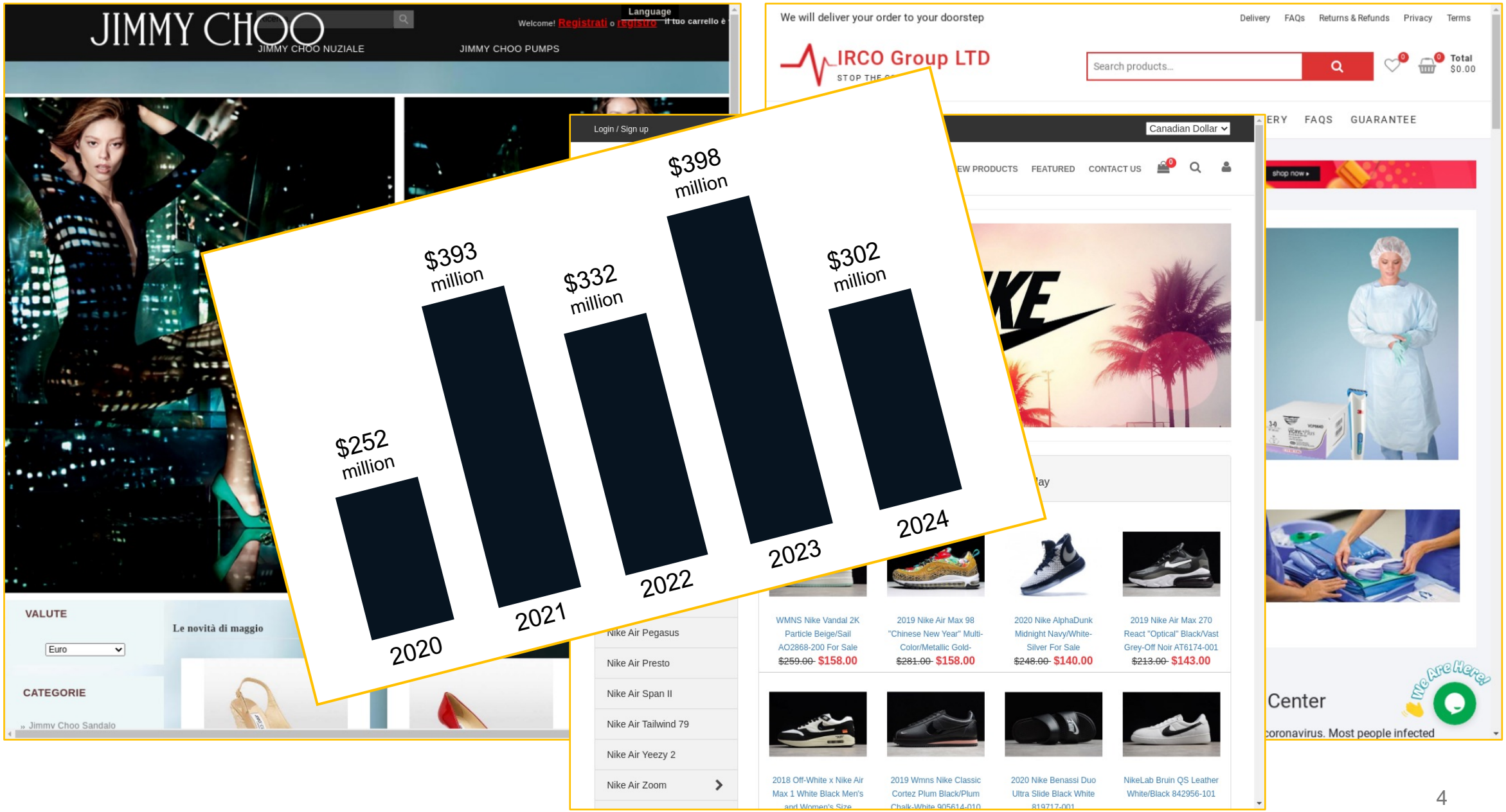
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$252 million
2020
$393 million
2021
$332 million
2022
$398 million
2023
$302 million
2024
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Nike Air Pegasus
Nike Air Presto
Nike Air Span II
Nike Air Tailwind 79
Nike Air Yeezy 2
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NikeLab Bruin QS Leather White/Black 842956-101
Center
coronavirus. Most people infected
We Are Here!

Detecting Fraudulent Shopping Websites

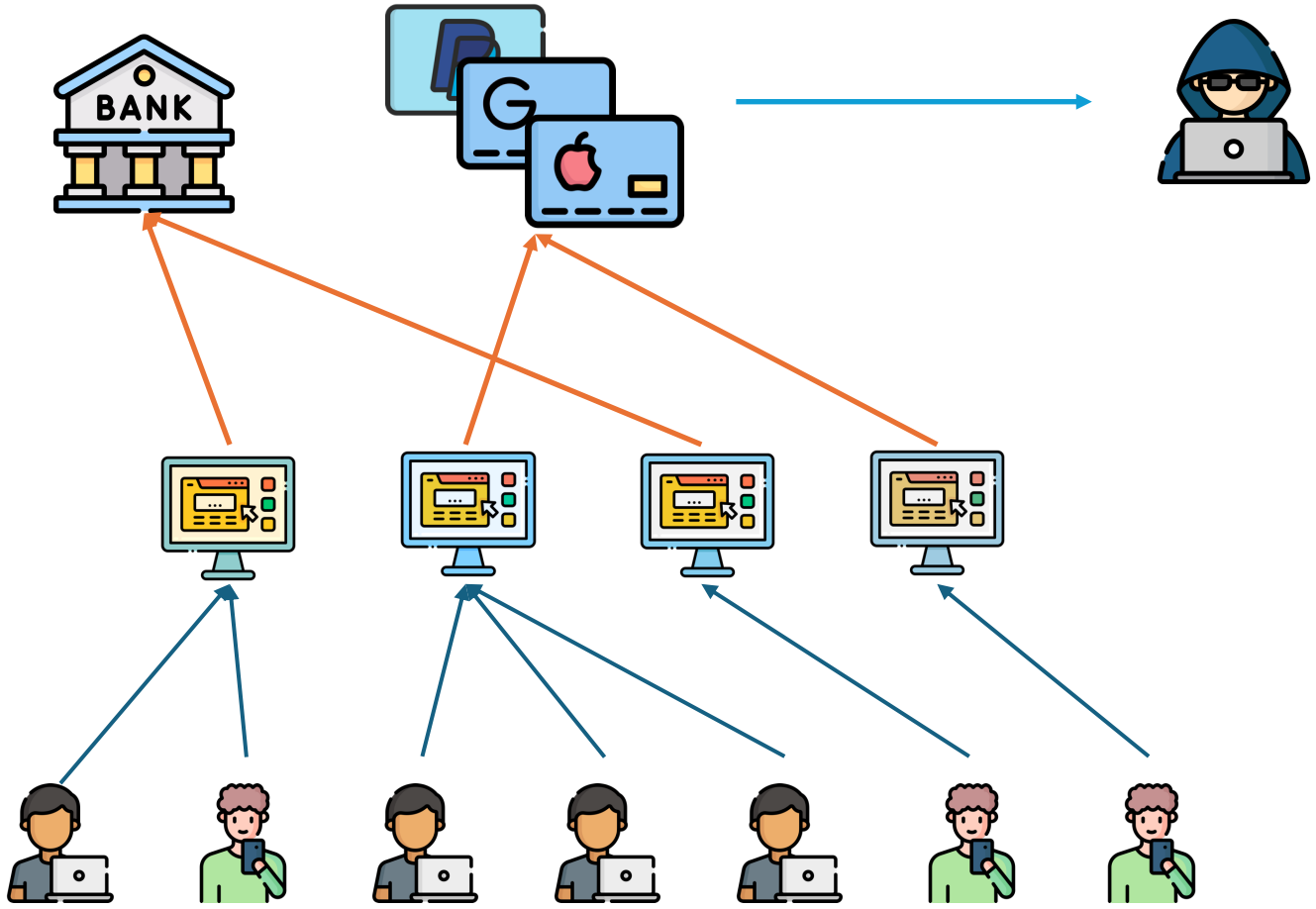
- Traditional ML approaches mostly use manually crafted features

- They struggle to keep pace with the evolving tactics

- Instead of using surface-level features, we need to dig deeper into the fraudulent shopping websites' infrastructure

- Insights from how such websites work can help future developments in detection methods

How Fraudulent Shopping Websites Work?

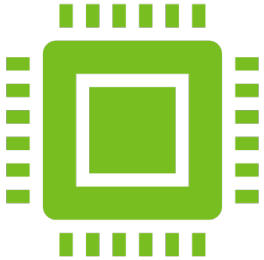


Analyzing Fraudulent Shopping Websites

Research Questions

How do fraudulent shopping websites work under the hood?

Can we pro-actively detect fraudulent shopping websites?



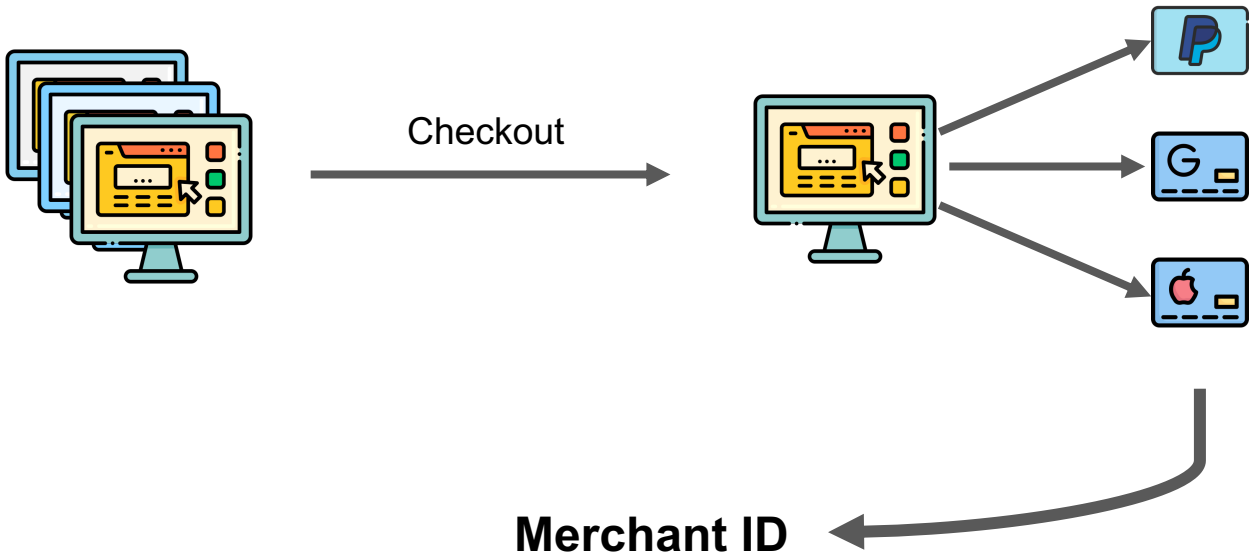
Investigation Method

Analyzing shopping websites from payment providers' point-of-view

Finding links between miscreants that create these websites

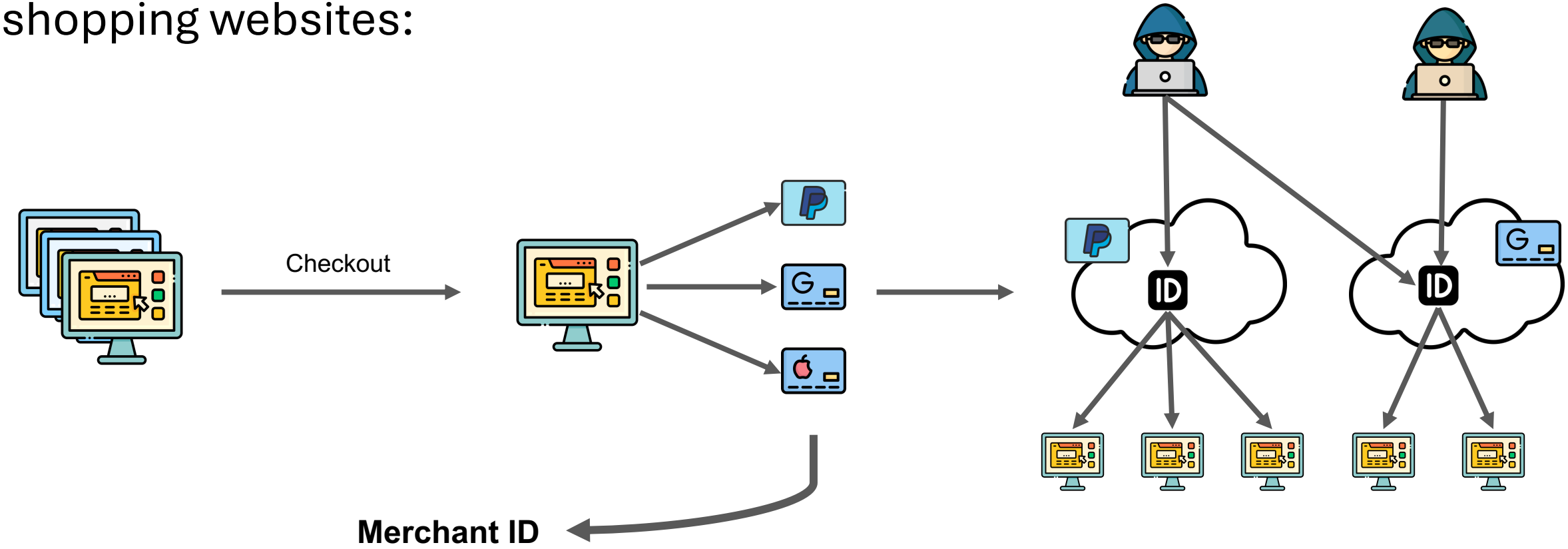
Analyzing Fraudulent Shopping Websites – Step 1: Manual Analysis

We manually analyze the process of buying items from Fraudulent Shopping Websites:



Analyzing Fraudulent Shopping Websites – Step 1: Manual Analysis

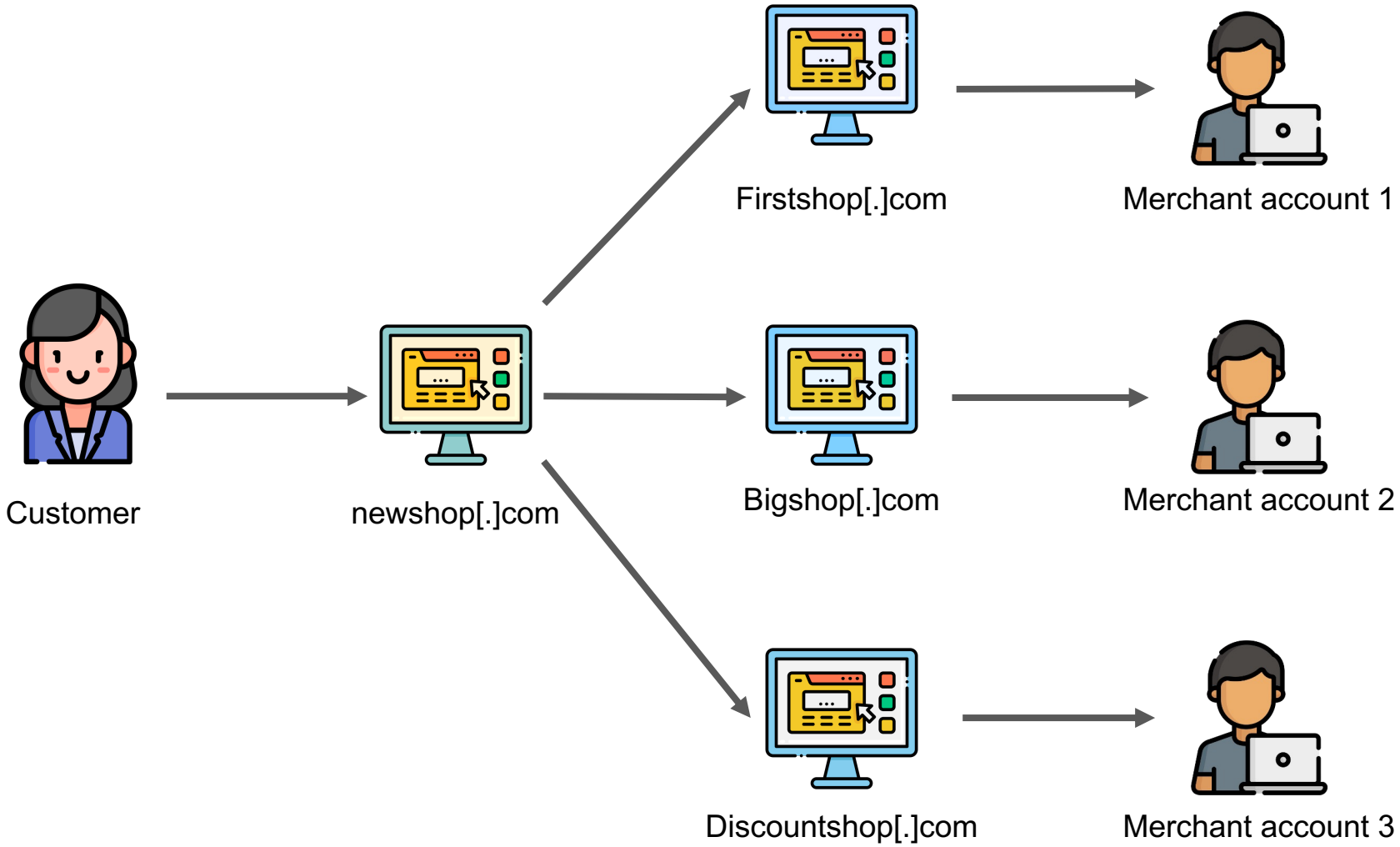
We observe that a single merchant can have multiple fraudulent shopping websites:



Merchant ID

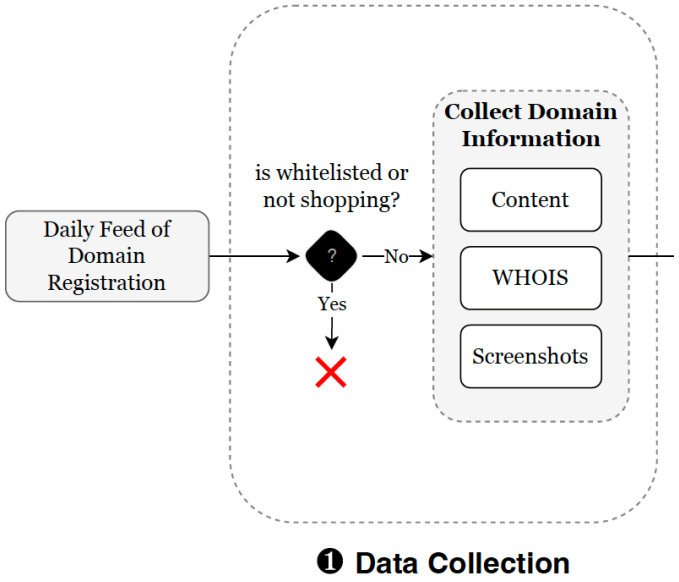
used to route payment to the website's merchant

Evasion Techniques



Scam Magnifier

To automate the process of data collection and analysis, we propose Scam Magnifier:



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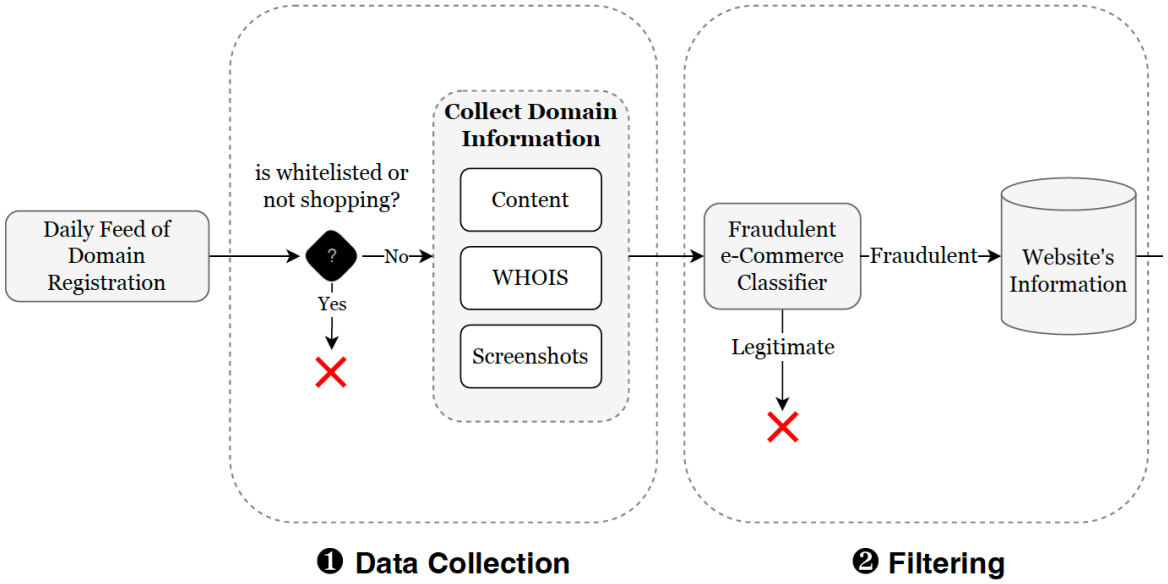

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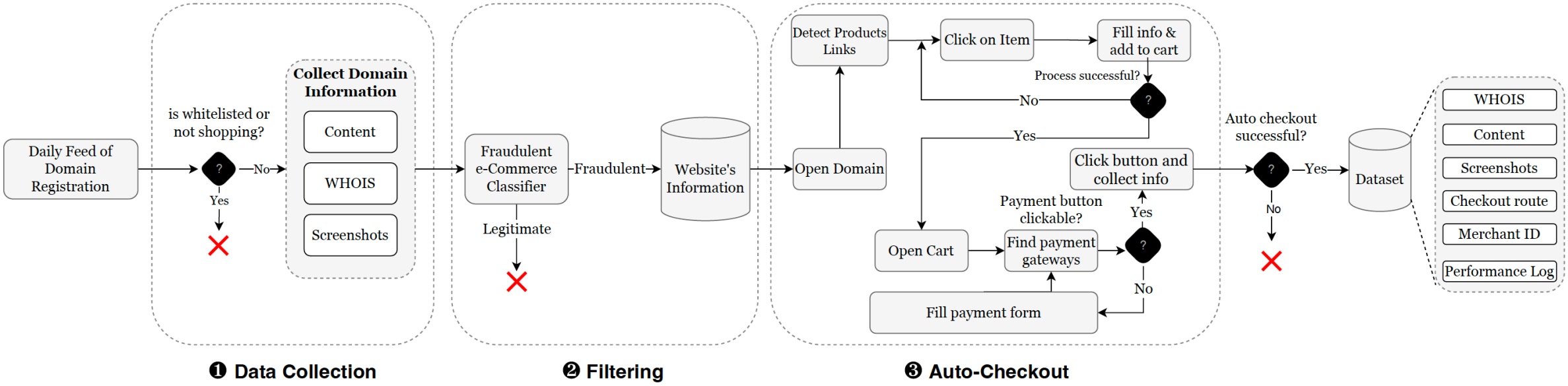
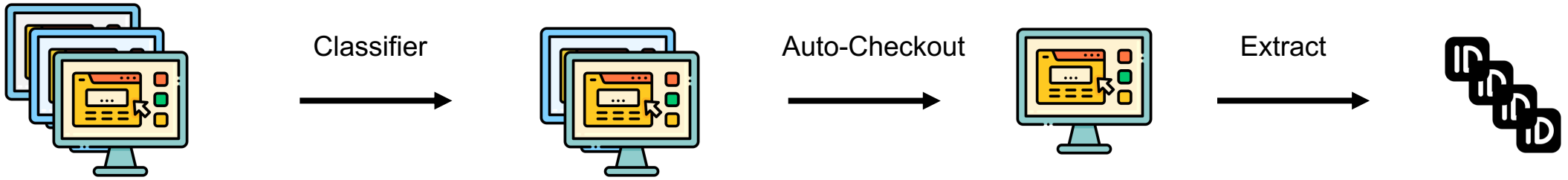
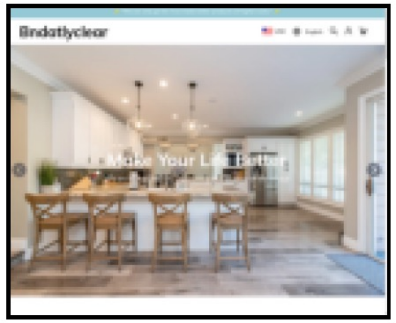


Scam Magnifier – Data Statistics



- Observations:
  - Different fraudulent websites use the same merchant ID
  - Common domain registrars and hosting providers

Similar Website Design



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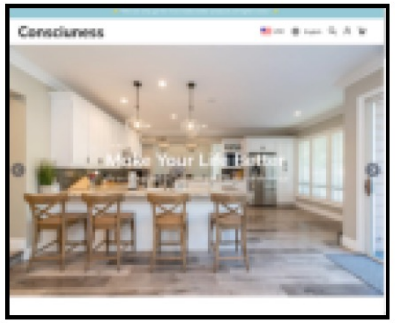

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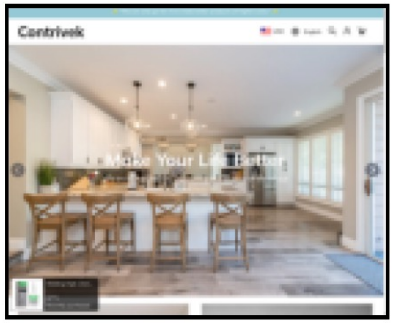

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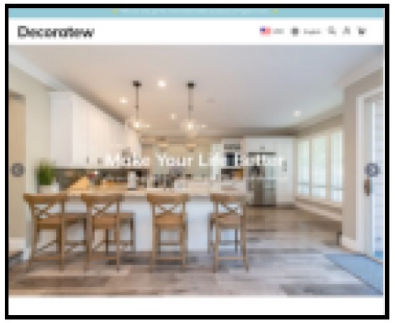

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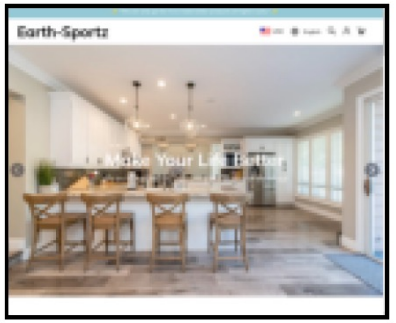

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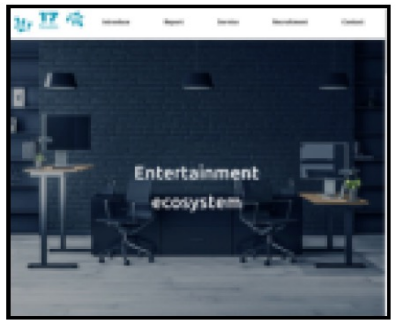

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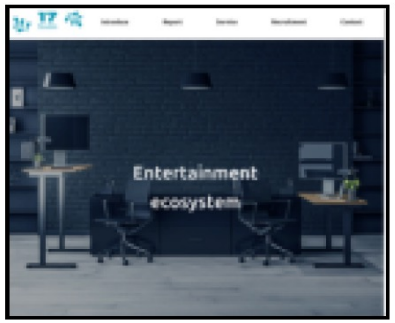

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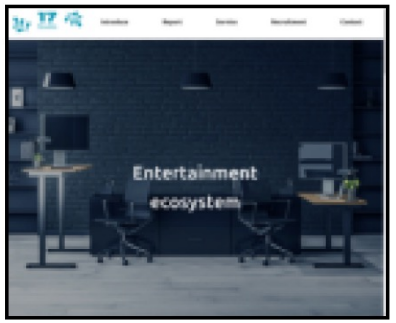

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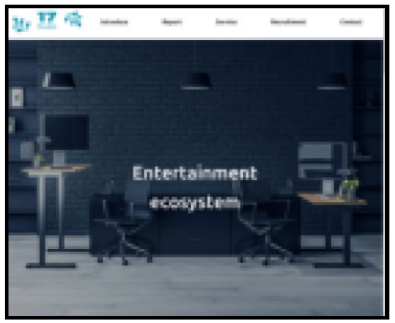

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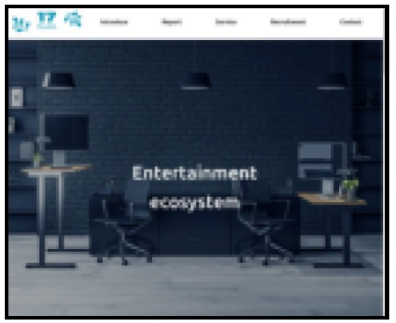

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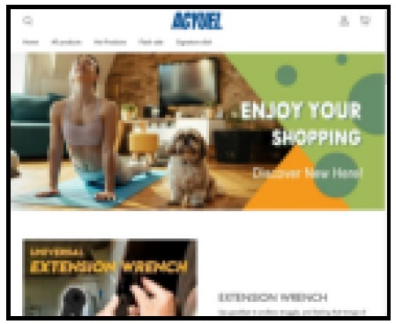

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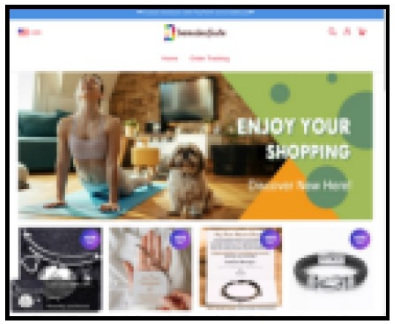

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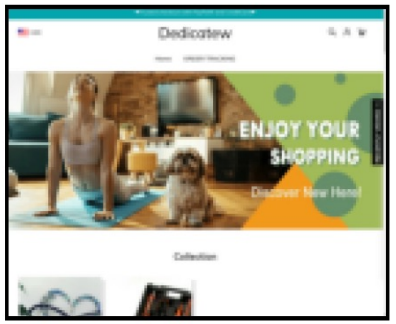

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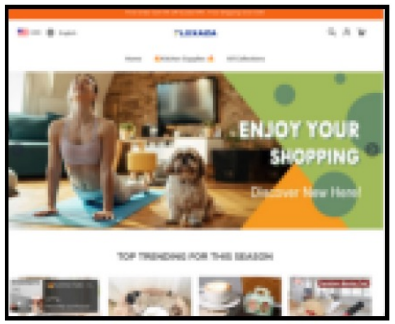

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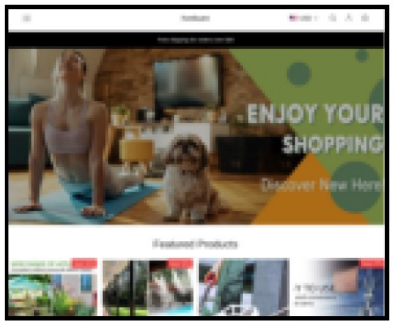

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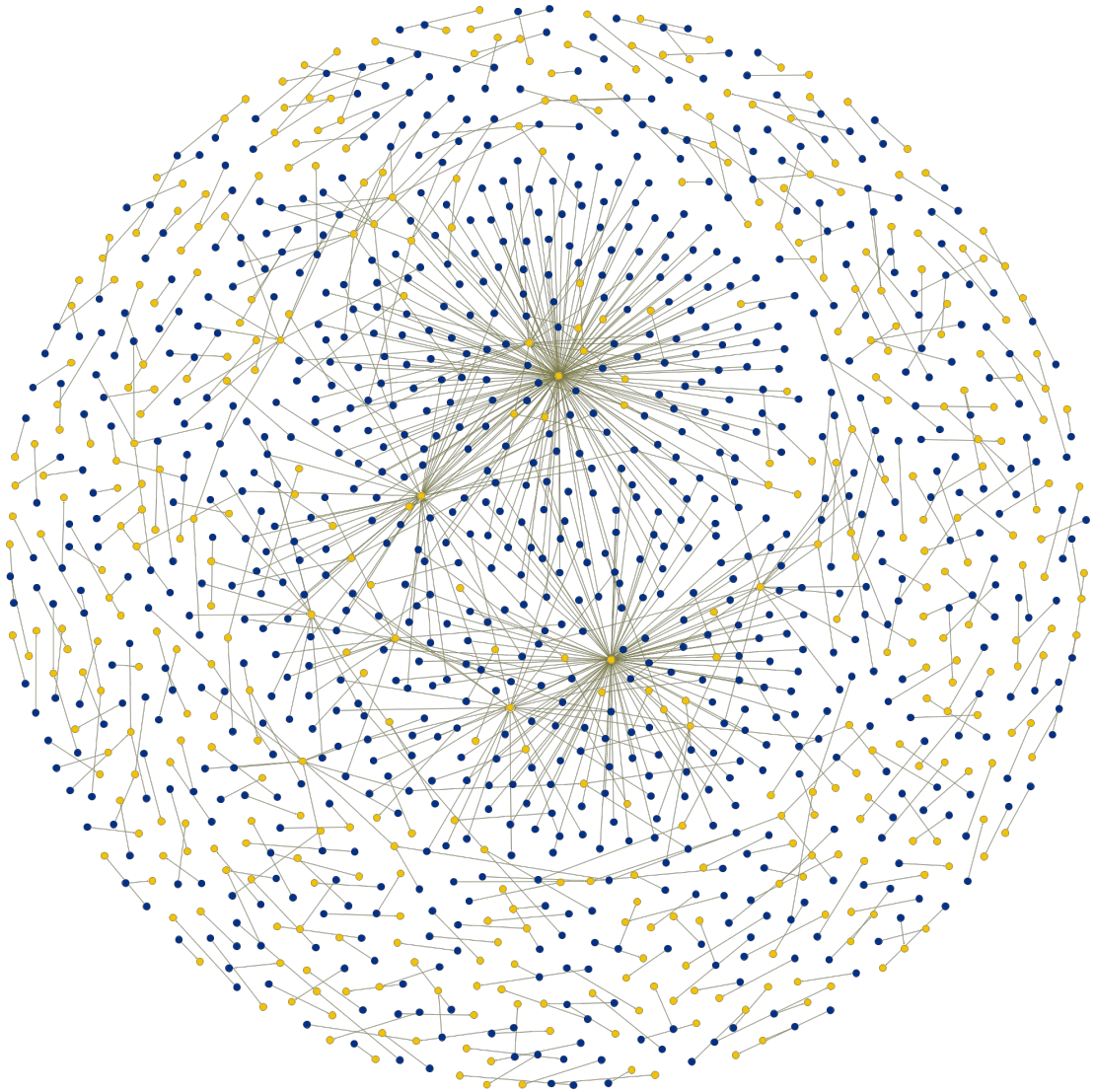
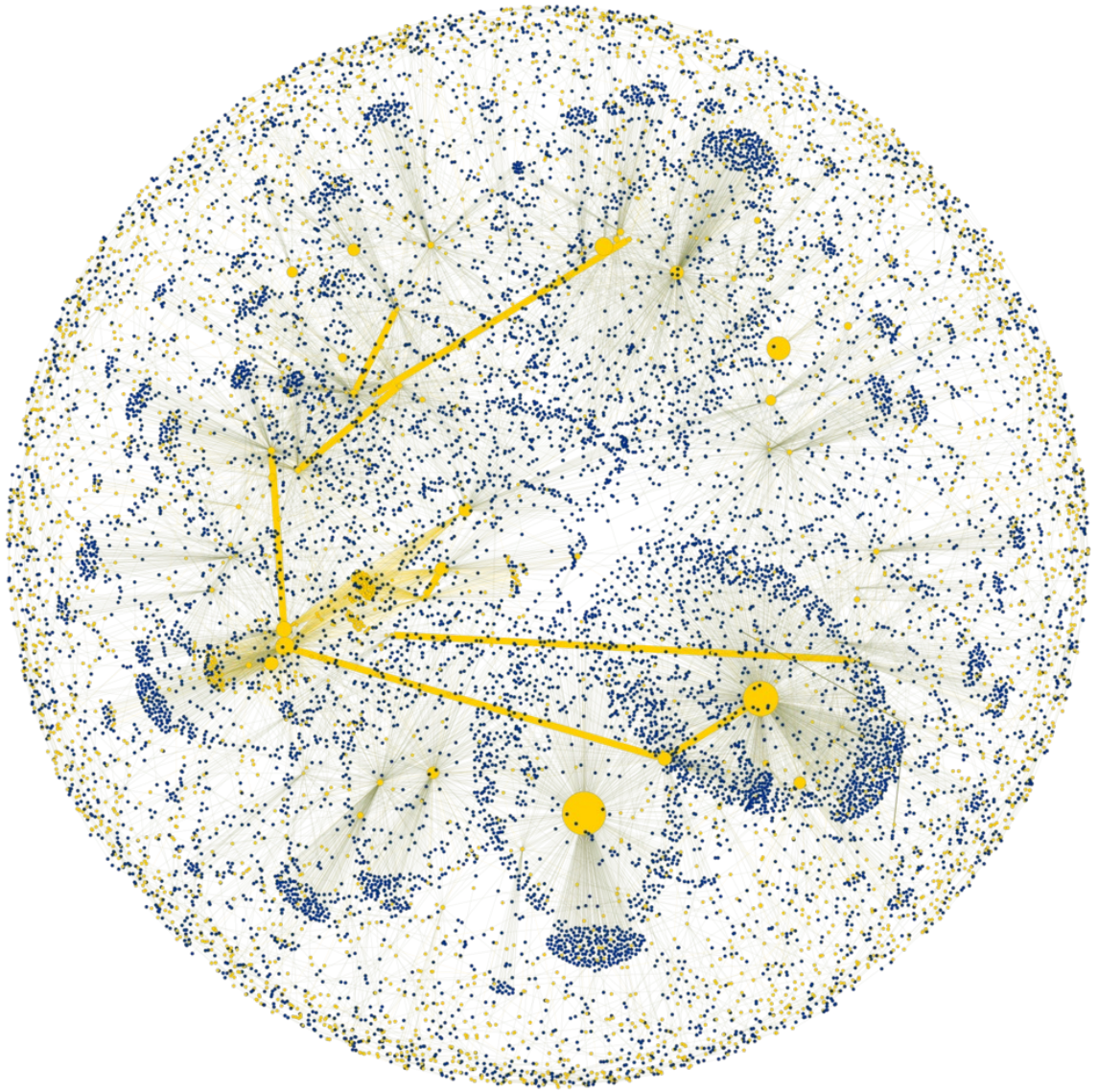
How to Link the Websites?

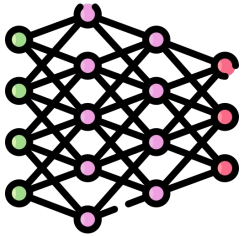




Merchants (in yellow) and their registered domains (in blue).

Takeaways

Reveals patterns of recurrence across multiple websites



Enhances response to similar threats
Preventing Financial Losses

Collaboration and data sharing between organizations
Blocklisting or flagging future transactions

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mbitaab@asu.edu