Edinburgh Napier UNIVERSITY

School of Computing

Ontology of Online Risk

Demo by David Haynes

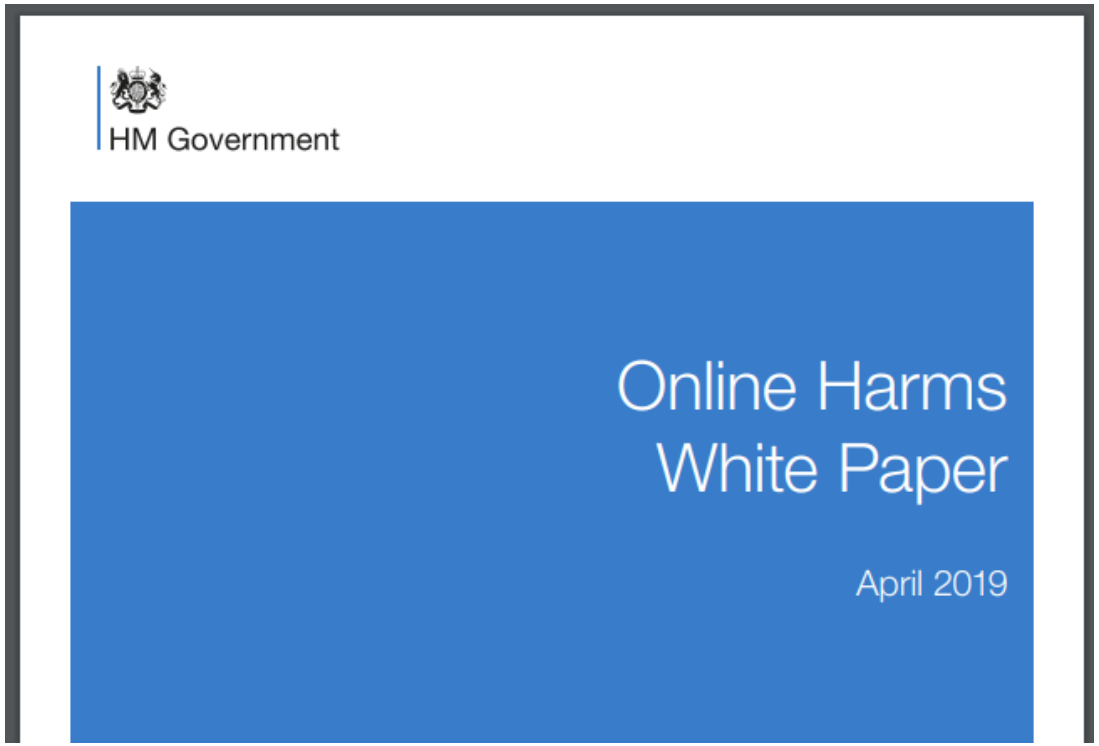
June 2020

Overview

- Background
- Method
- Risk model
- Ontology demo
- Further work
- Potential applications
- Questions
- Acknowledgement

Background

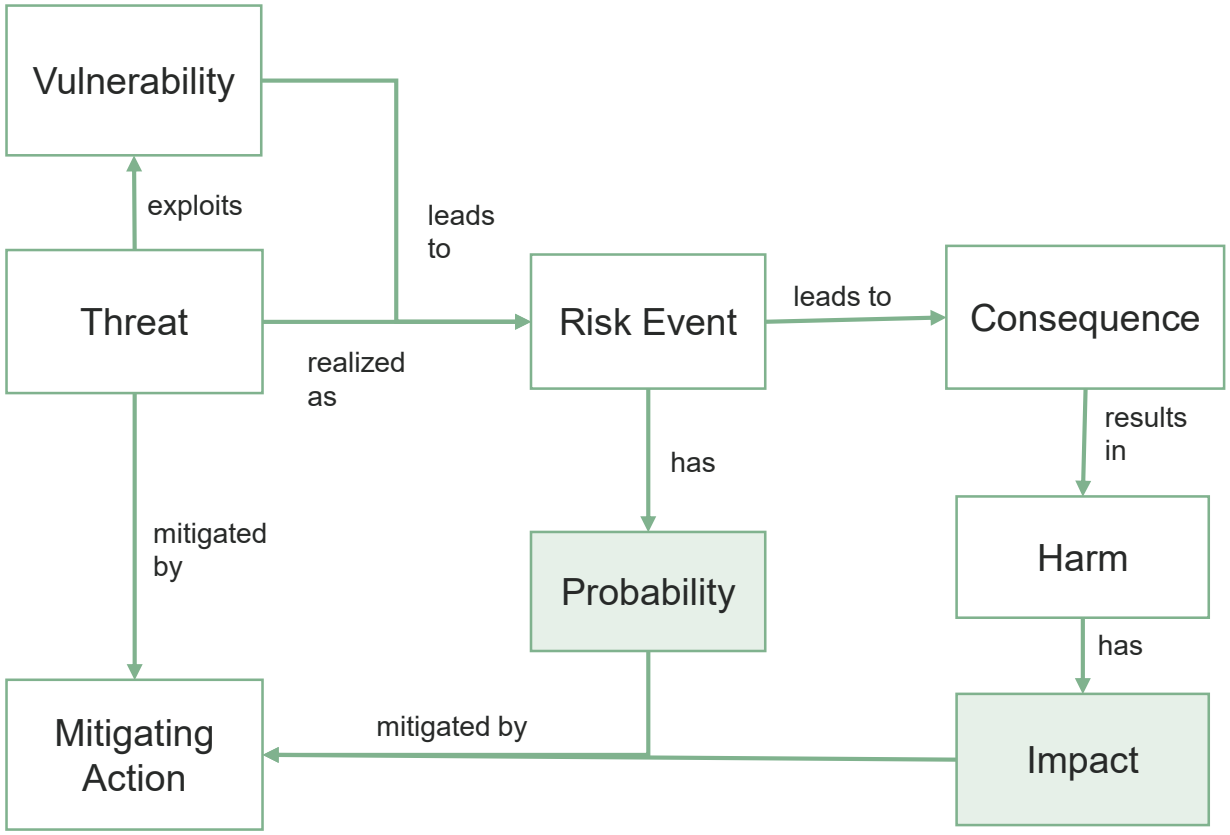
- Concern about online safety
- A number of initiatives by ICO, Police forces and DCMS
- Shift of focus from corporate risk to individual risk
- Privacy calculus – individual assessment of benefits versus risks

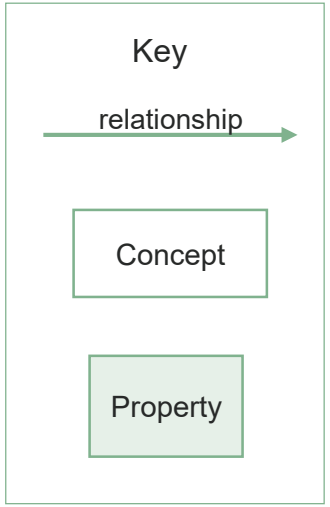


Method

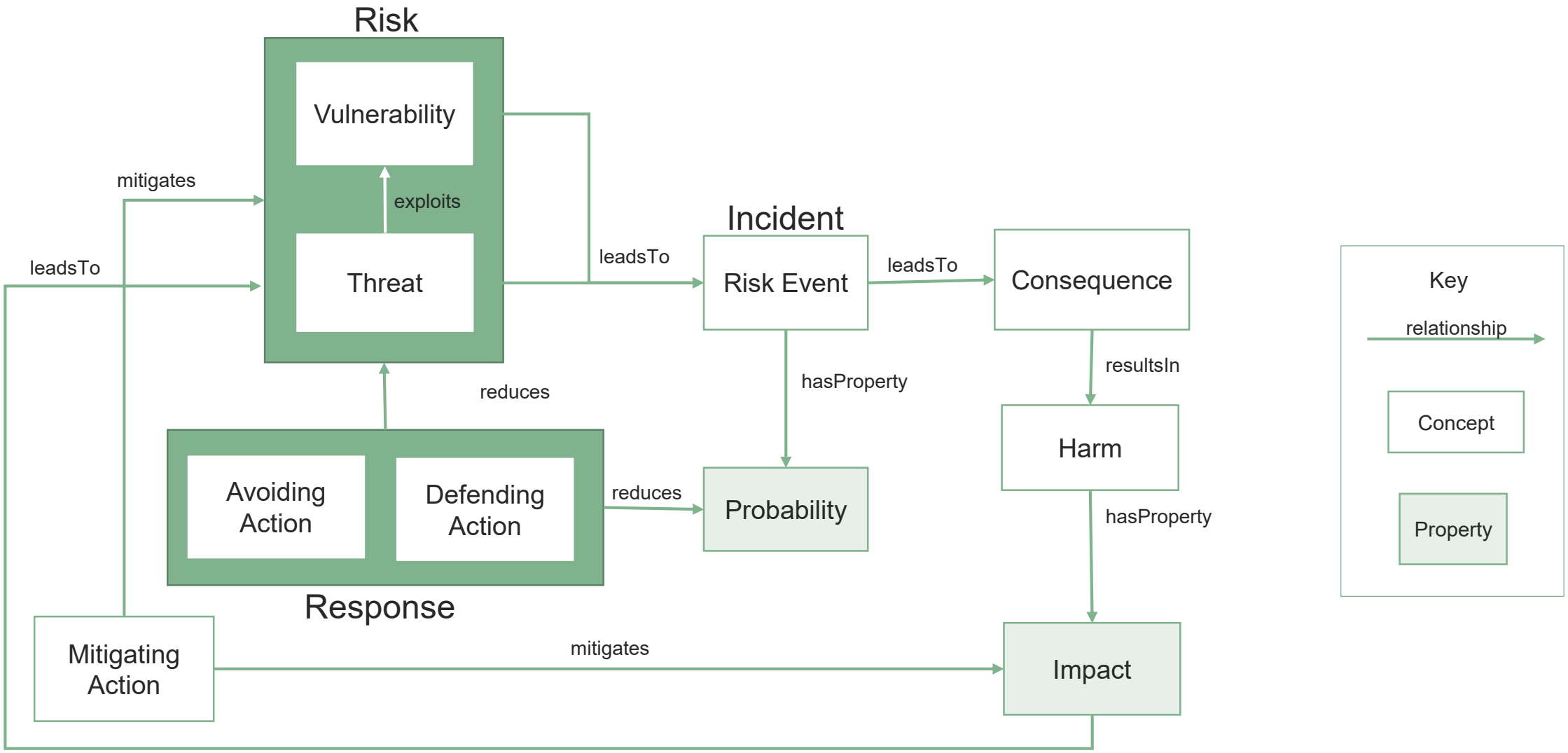
- Identified common risks by monitoring individual online use
- Used this to develop a scope for the ontology
- Imported existing terminology and definitions
- Developed scenarios where individuals are exposed to online risk
- Created relationships between different elements of risk
- Tested scenarios in a workshop and modified the ontology

Modelling Risk





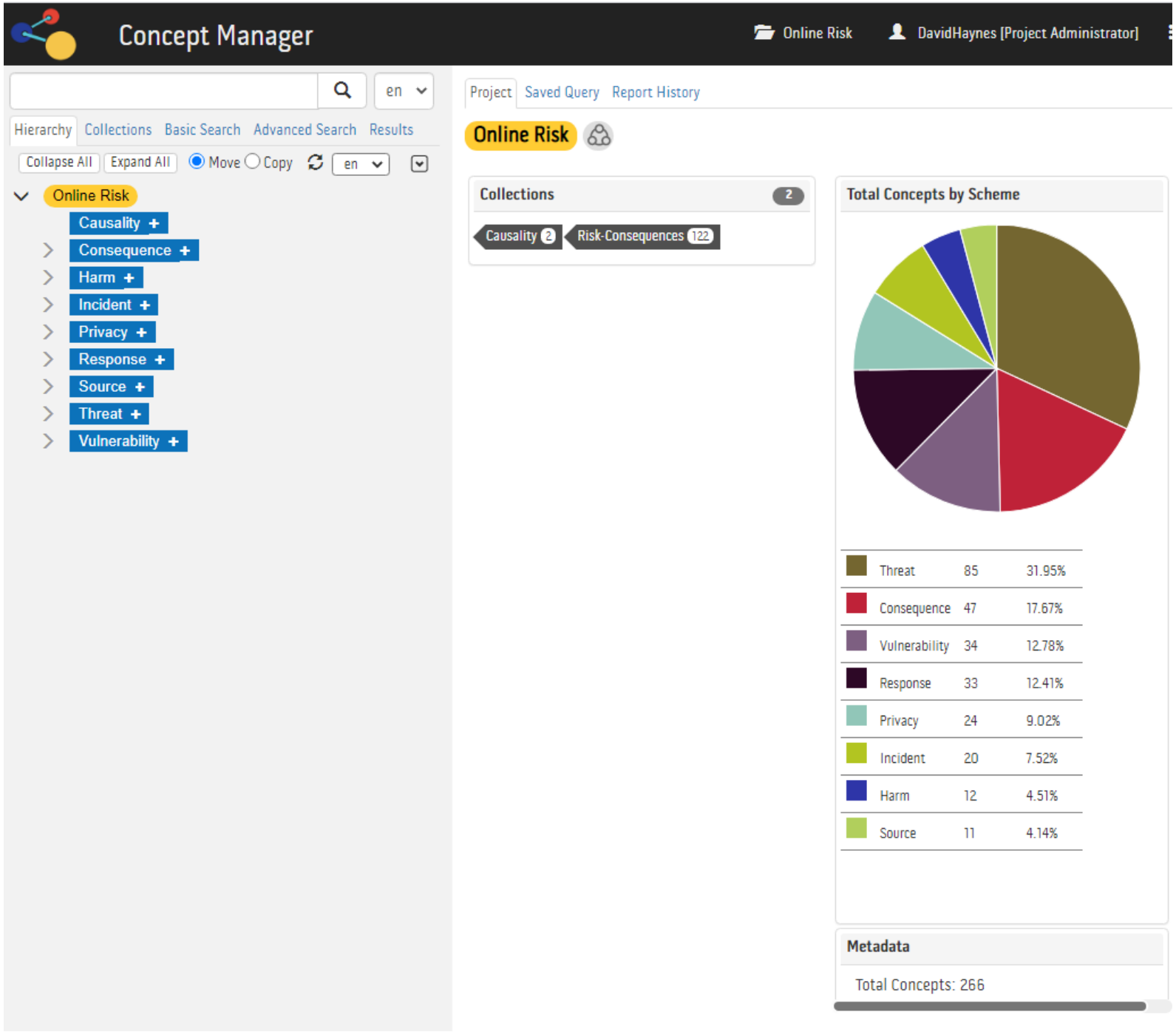
Modified Model



Ontology demo

- Using Synaptica's Graphite system


Graphite
Online Risk
DavidHaynes [Project Administrator]
Online Risk



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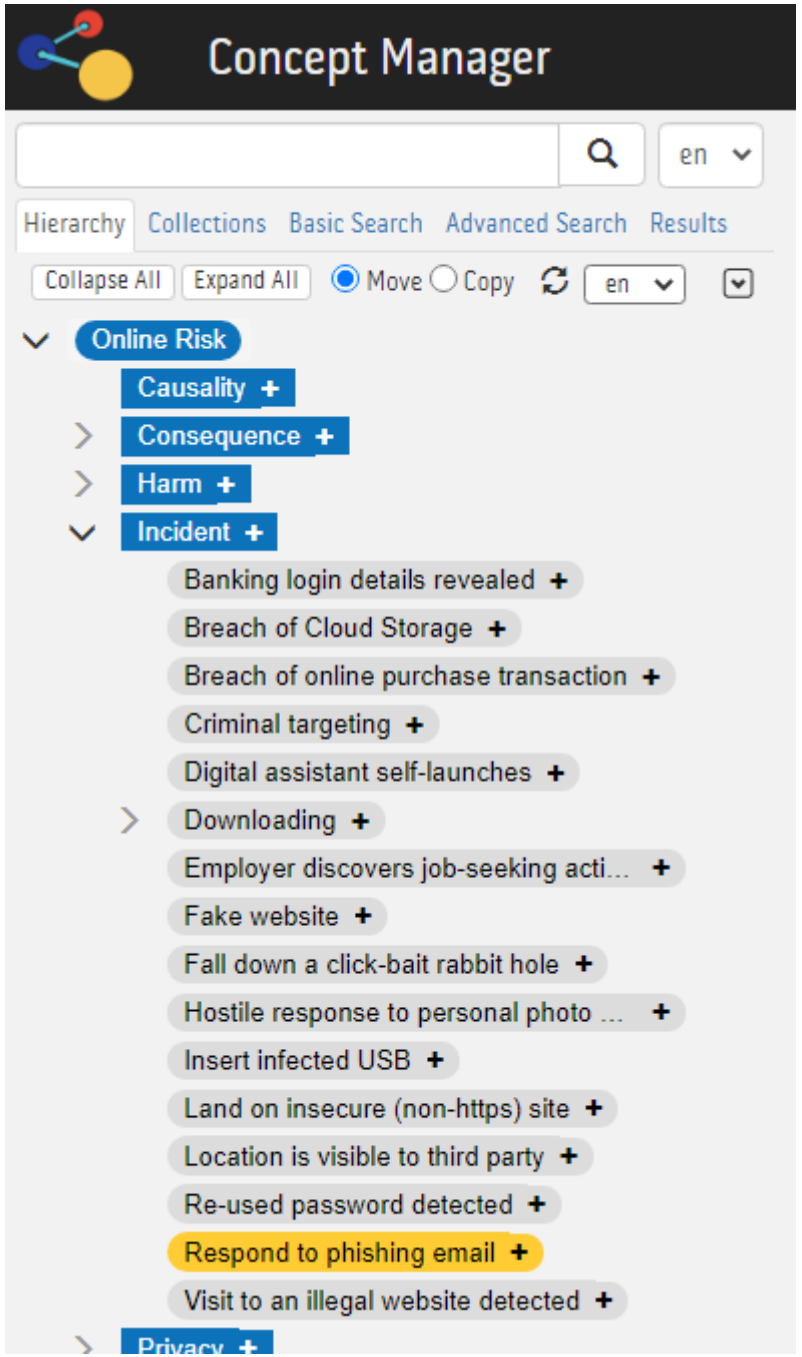
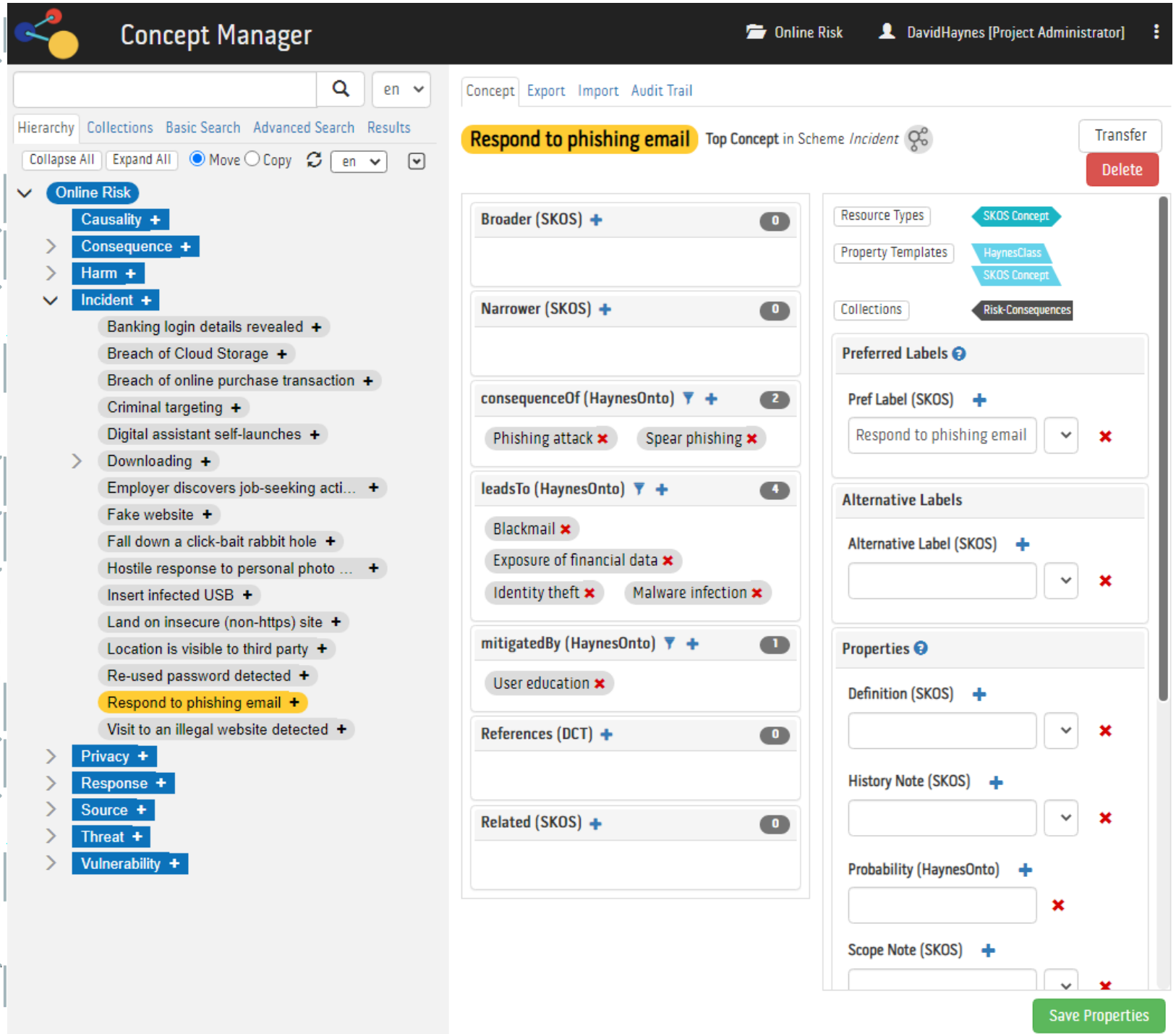

Concept Manager
en
Hierarchy
Collections
Basic Search
Advanced Search
Results
Collapse All
Expand All
Move
Copy
en
Online Risk
Causality +
Consequence +
Harm +
Incident +
Banking login details revealed +
Breach of Cloud Storage +
Breach of online purchase transaction +
Criminal targeting +
Digital assistant self-launches +
Downloading +
Employer discovers job-seeking acti... +
Fake website +
Fall down a click-bait rabbit hole +
Hostile response to personal photo ... +
Insert infected USB +
Land on insecure (non-https) site +
Location is visible to third party +
Re-used password detected +
Respond to phishing email +
Visit to an illegal website detected +
Privacy +



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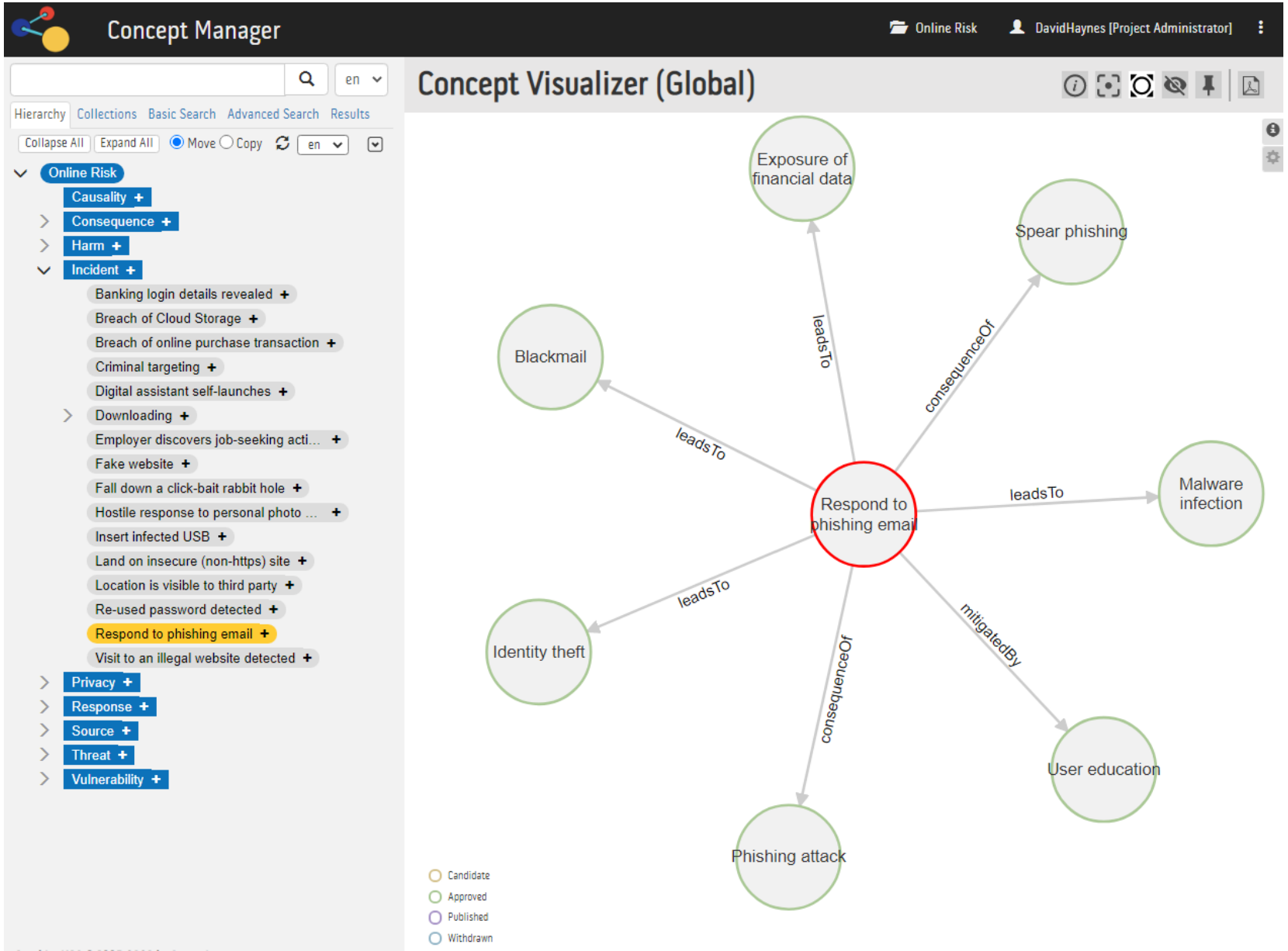
Concept Manager
Online Risk
DavidHaynes [Project Administrator]
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Hierarchy
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Expand All
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Copy
Online Risk
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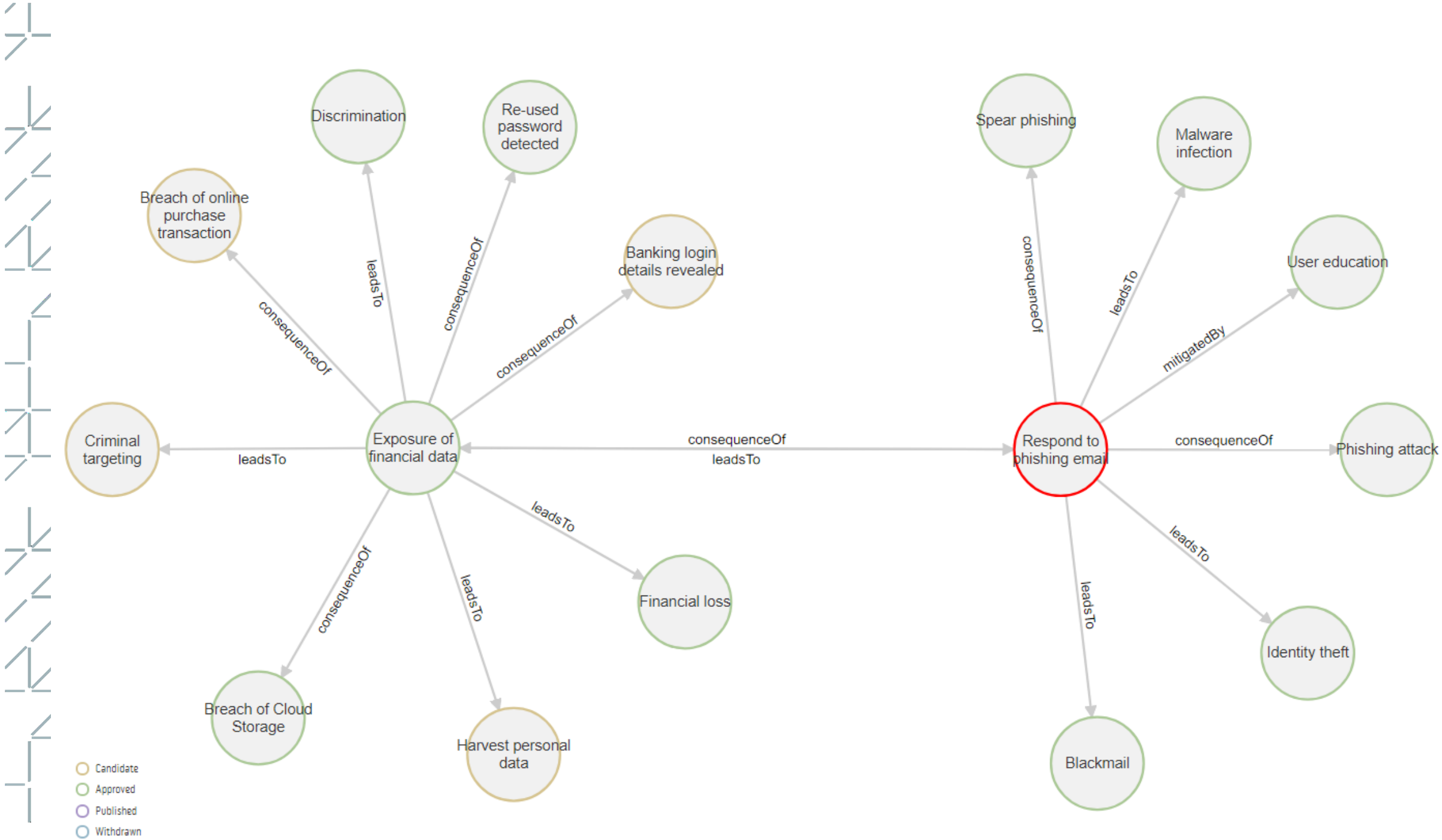
Privacy
Response
Source
Threat
Vulnerability
Concept Visualizer (Global)
Exposure of financial data
Spear phishing
Blackmail
leadsTo
consequenceOf
leadsTo
Respond to phishing email
leadsTo
Malware infection
leadsTo
Identity theft
consequenceOf
mitigatedBy
User education
Phishing attack
Candidate
Approved
Published
Withdrawn


Discrimination
Re-used password detected
Breach of online purchase transaction
Banking login details revealed
Spear phishing
Malware infection
User education
Criminal targeting
Exposure of financial data
Respond to phishing email
Phishing attack
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Breach of Cloud Storage
Harvest personal data
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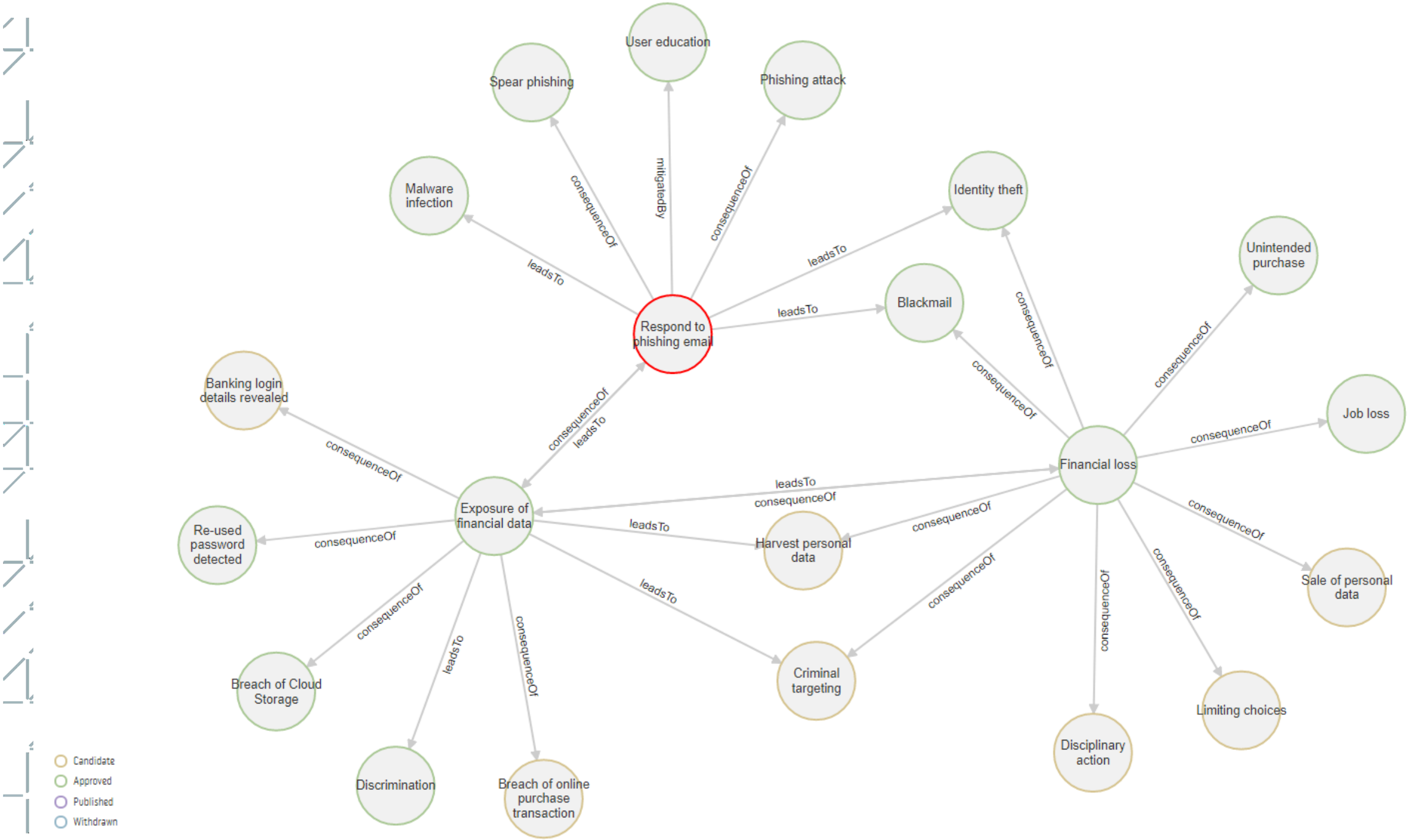
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Financial loss
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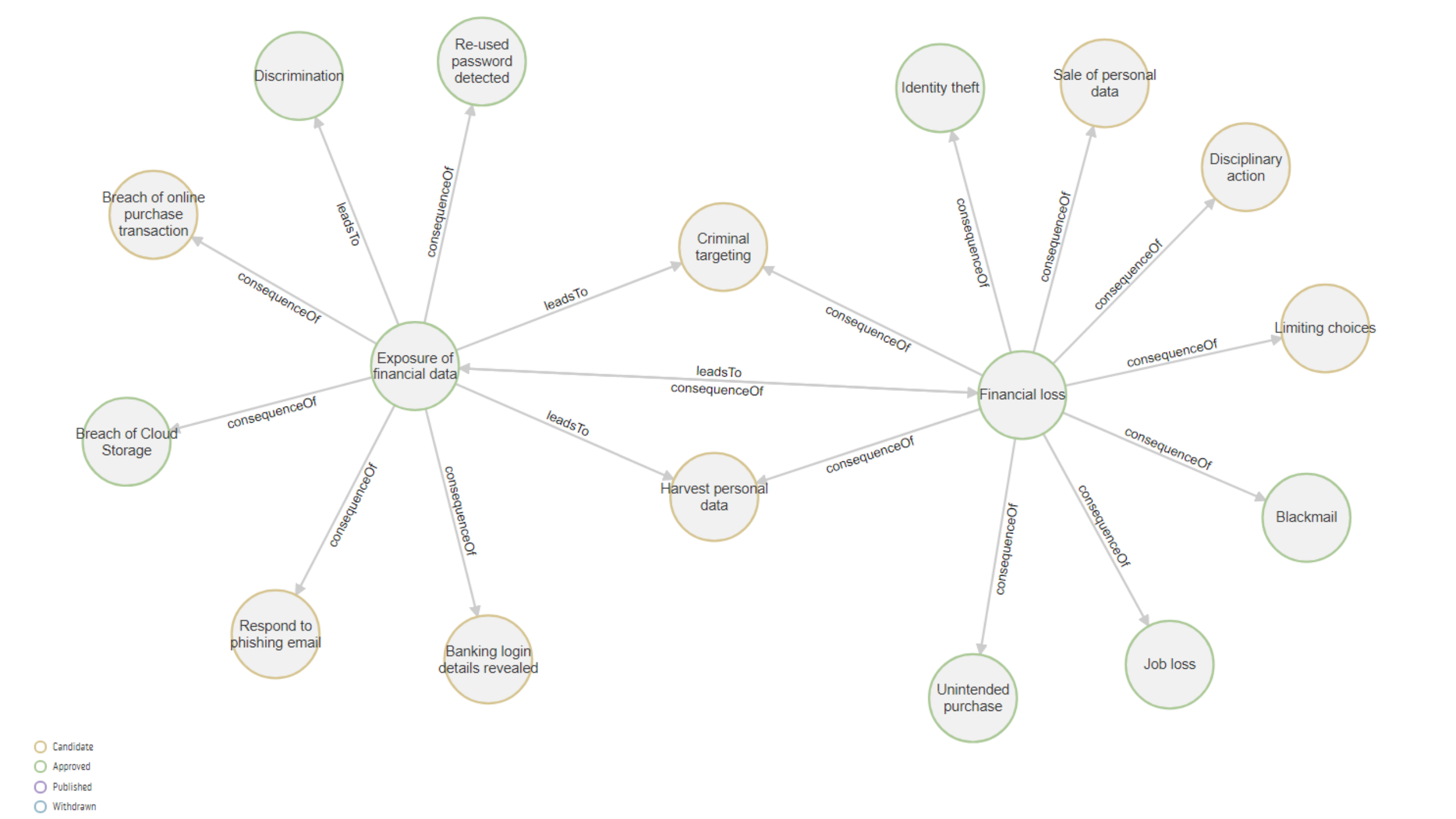
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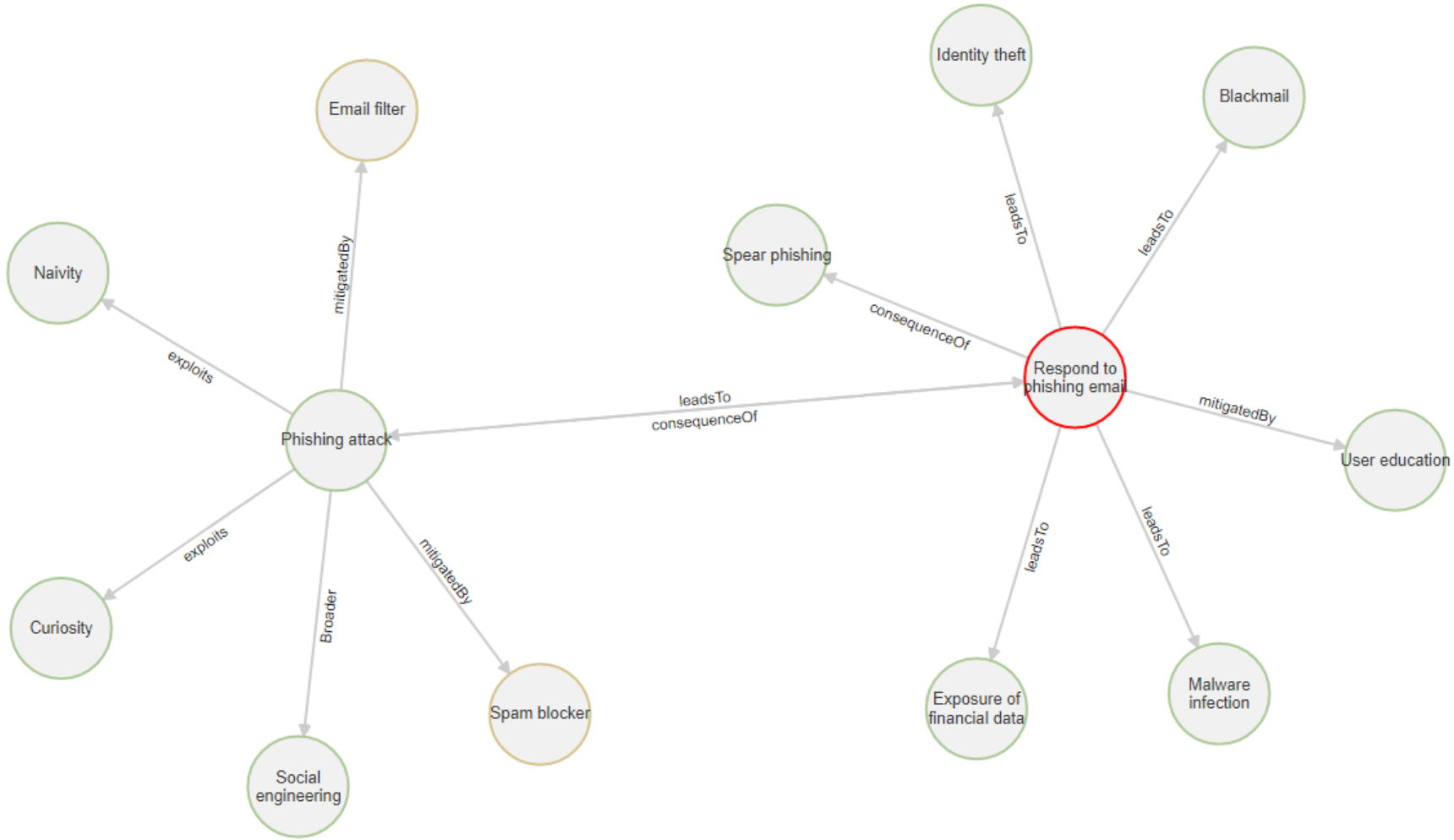
Email filter
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Identity theft
Blackmail
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Broader
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Social engineering
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leadsTo
Exposure of financial data
Malware infection

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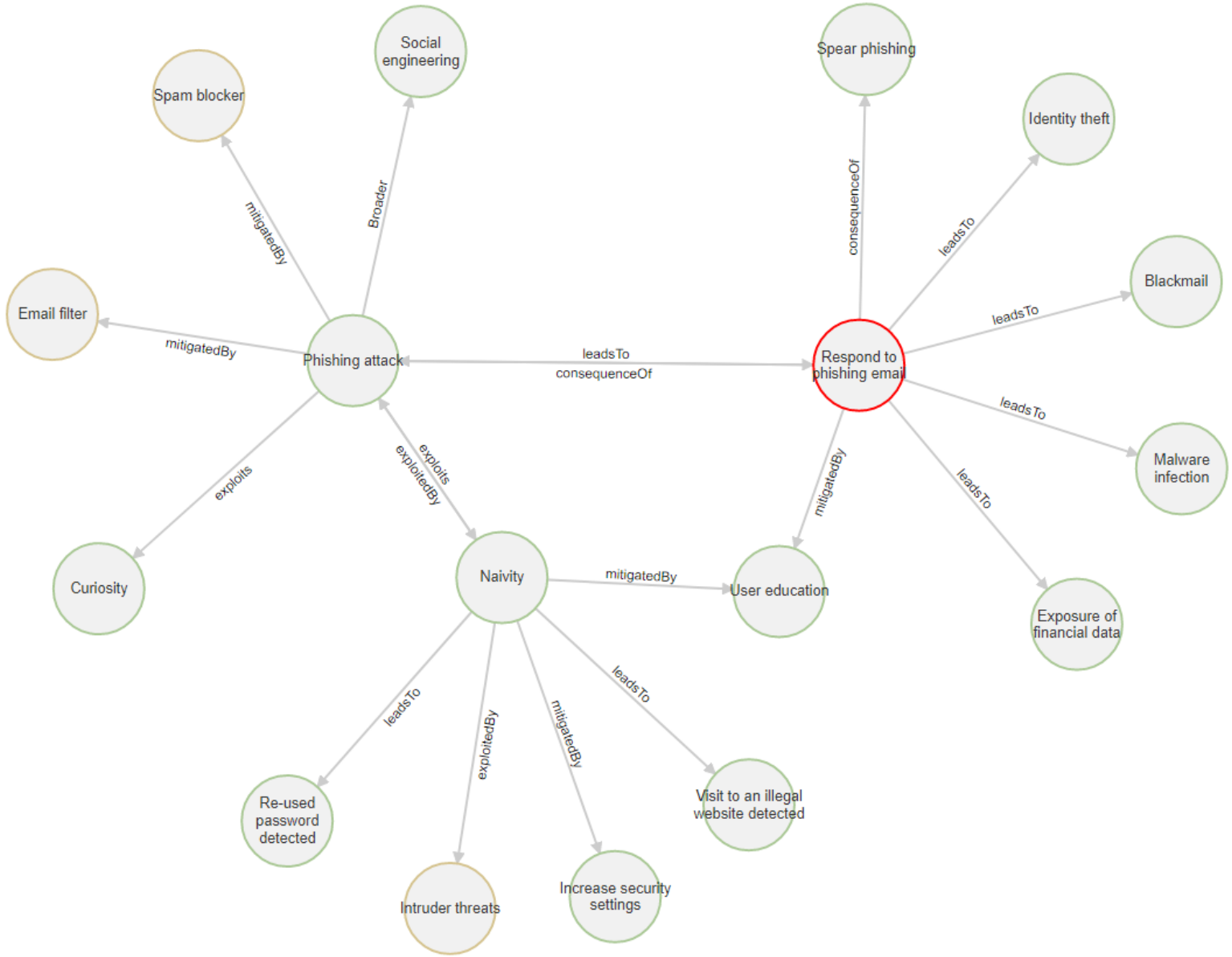

Further work

- Further development of the risk model
- Making the ontology available and discoverable
- Integration with high-level ontologies such as the Basic Fundamental Ontology
- Population of the ontology with instances using linked open data sets
- Explore strengths of relationships and associations between concepts in a populated ontology

Potential applications

- Identify commonalities between incidents
- Facilitate responses based on common characteristics
- Inform policy-making
- Better understanding for estimating risk probability and impact

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Thank you!

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