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Analyzing Trust in Technology Strategies

Privacy, Security, Trust 2006
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How do we develop technology strategies within a strategic business network?

I want to profit from Technology.

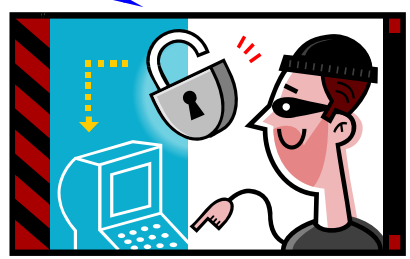
I want to acquire Technology as cheaply as possible.

I want to profit from Copyrighted Content.

I want to profit by gaining access to Technology.

I want to exchange Pirated Content!

I want to acquire Copyrighted Content as cheaply as possible.

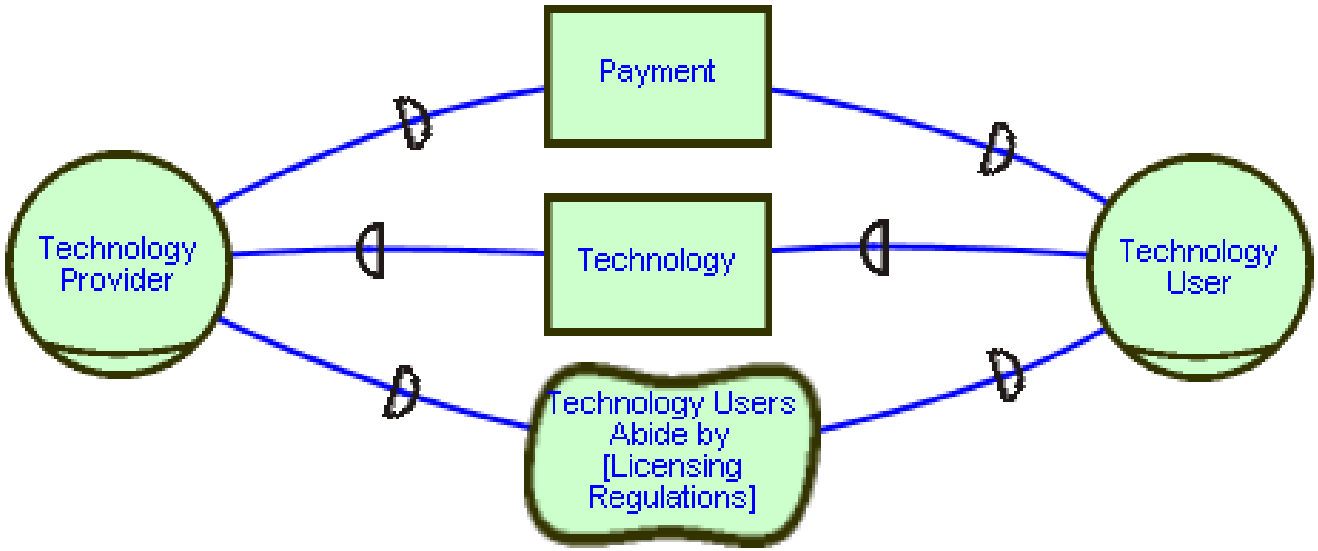


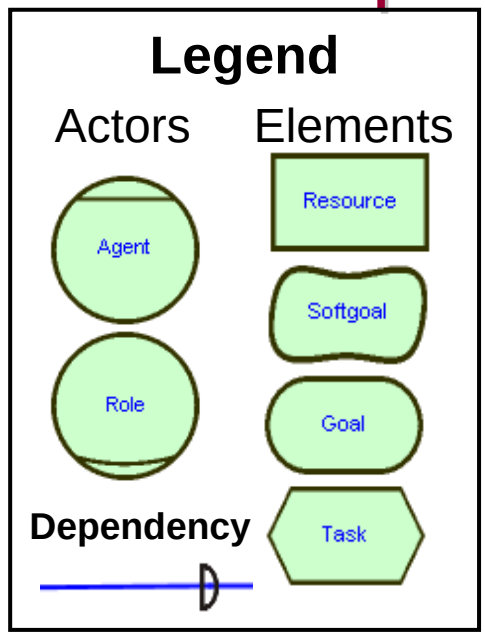
Presentation Outline

- Motivation: Understanding Technology Strategies in a Strategic Network
- Our Approach
  - Social, Intentional Modeling
  - The i* Framework
  - i* Evaluation Procedure
- Case Study: Trusted Computing
  - The Business of Content and Technology
  - Proponents of Trusted Computing
  - Opponents of Trusted Computing
- Conclusions
- Limitations and Future Work

The i* Framework

Technology User – Provider: Simplified Example

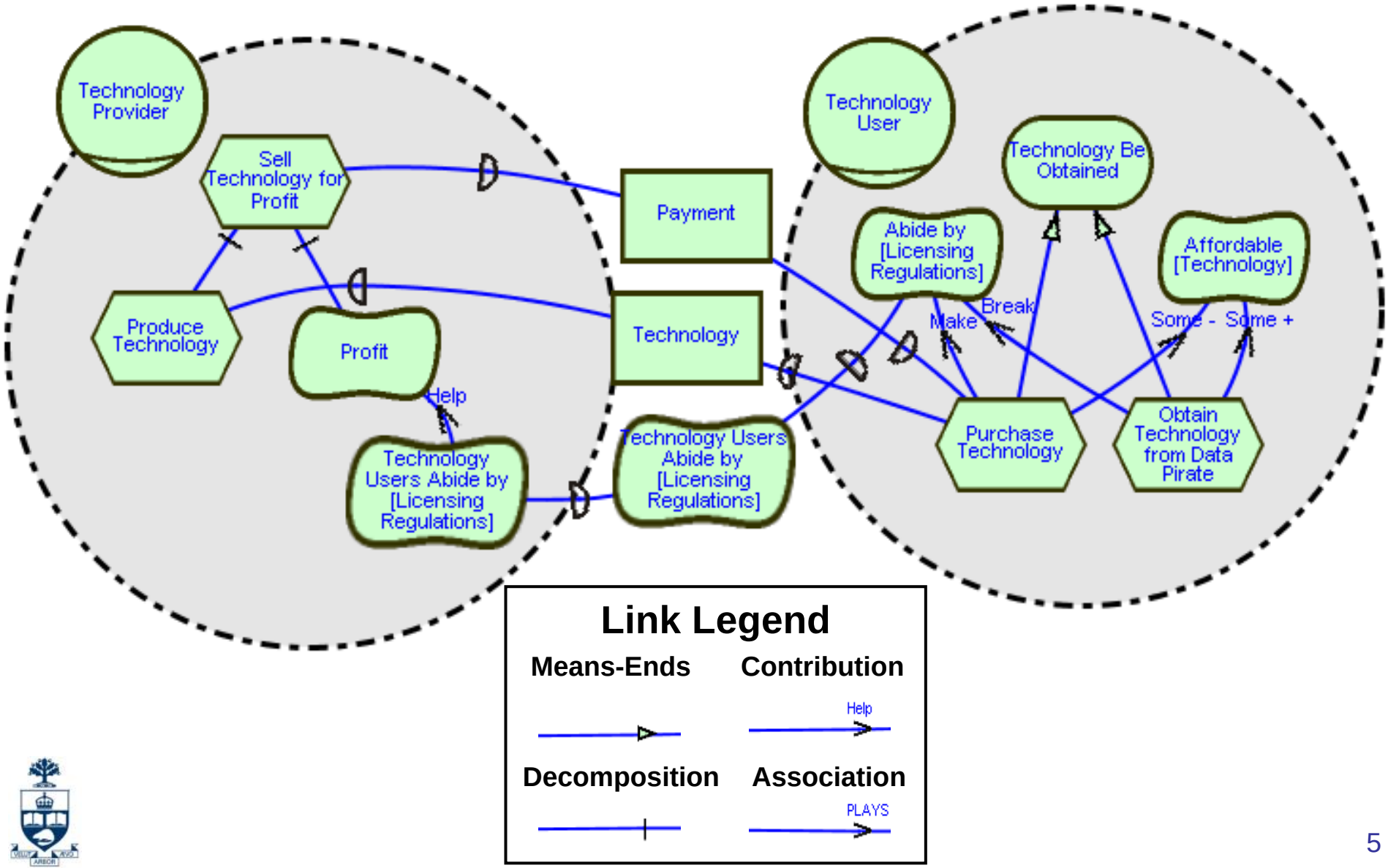




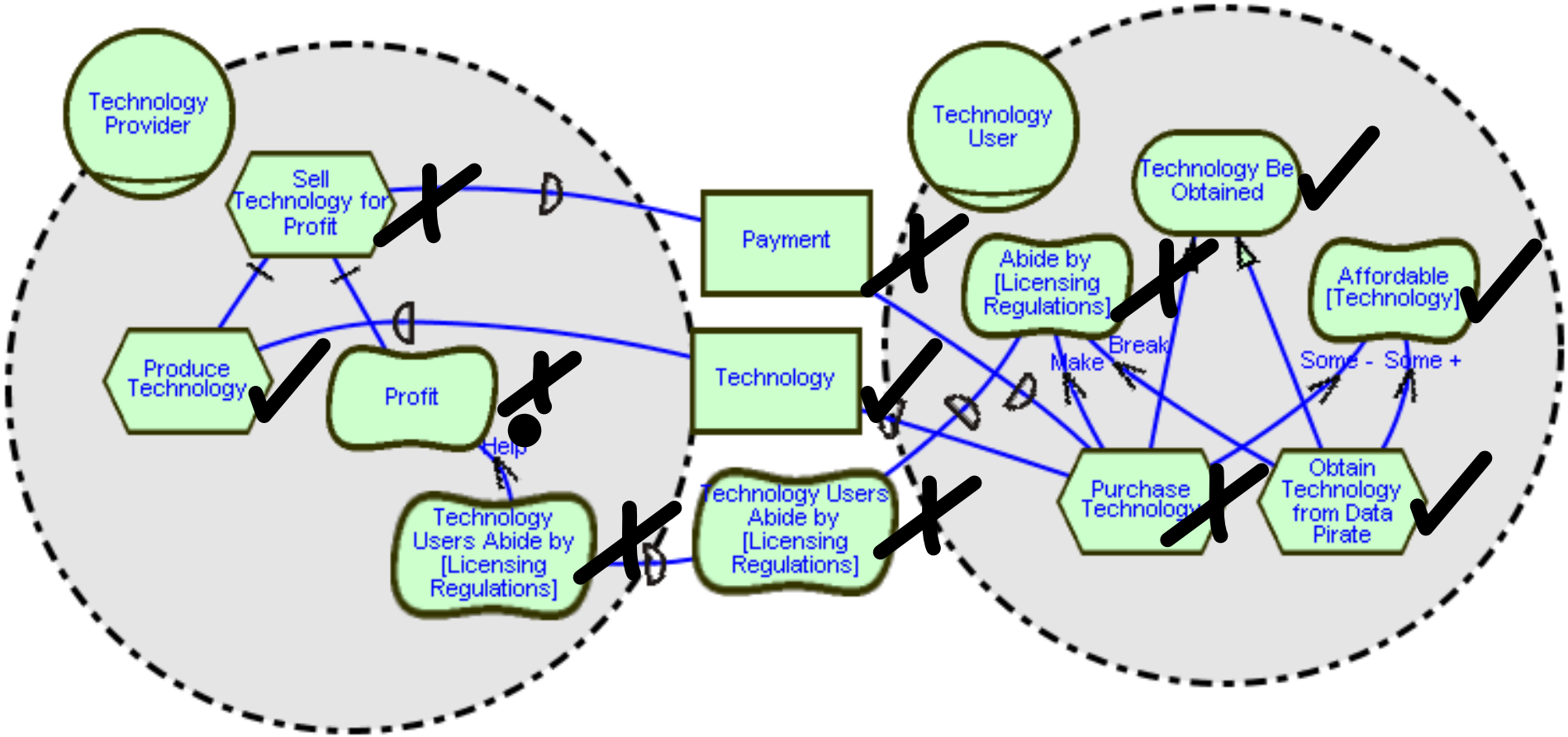
- i* uses intentional, autonomous actors
- Captures the dependencies between strategic actors
- Focuses on answering questions such as "why?", "who?", "how?", and "how else?"

The i* Framework

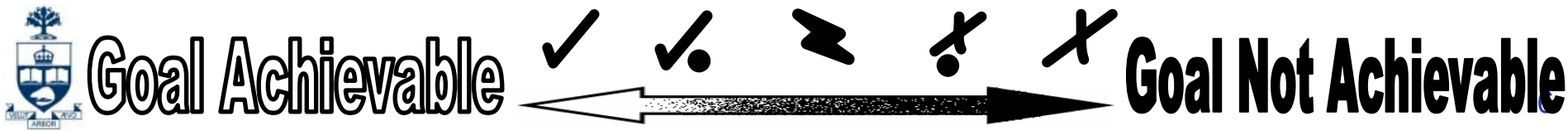
Technology User – Provider: Simplified Example



i* Evaluation Procedure

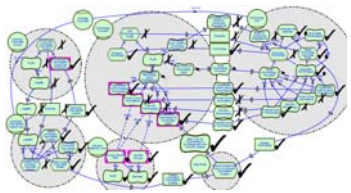


- Semi-automatable propagation of qualitative evaluation labels uses evaluation guidelines and human judgment.



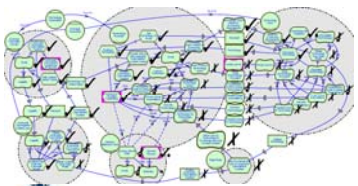
Case Study: Trusted Computing (TC)

- TC is Technology proposed by a set of technology vendors, now represented by the Trusted Computing Group (TCG).
- Case Study Steps:



- Model TC context: the business of content and technology

- Model the affects of TC according to proponents

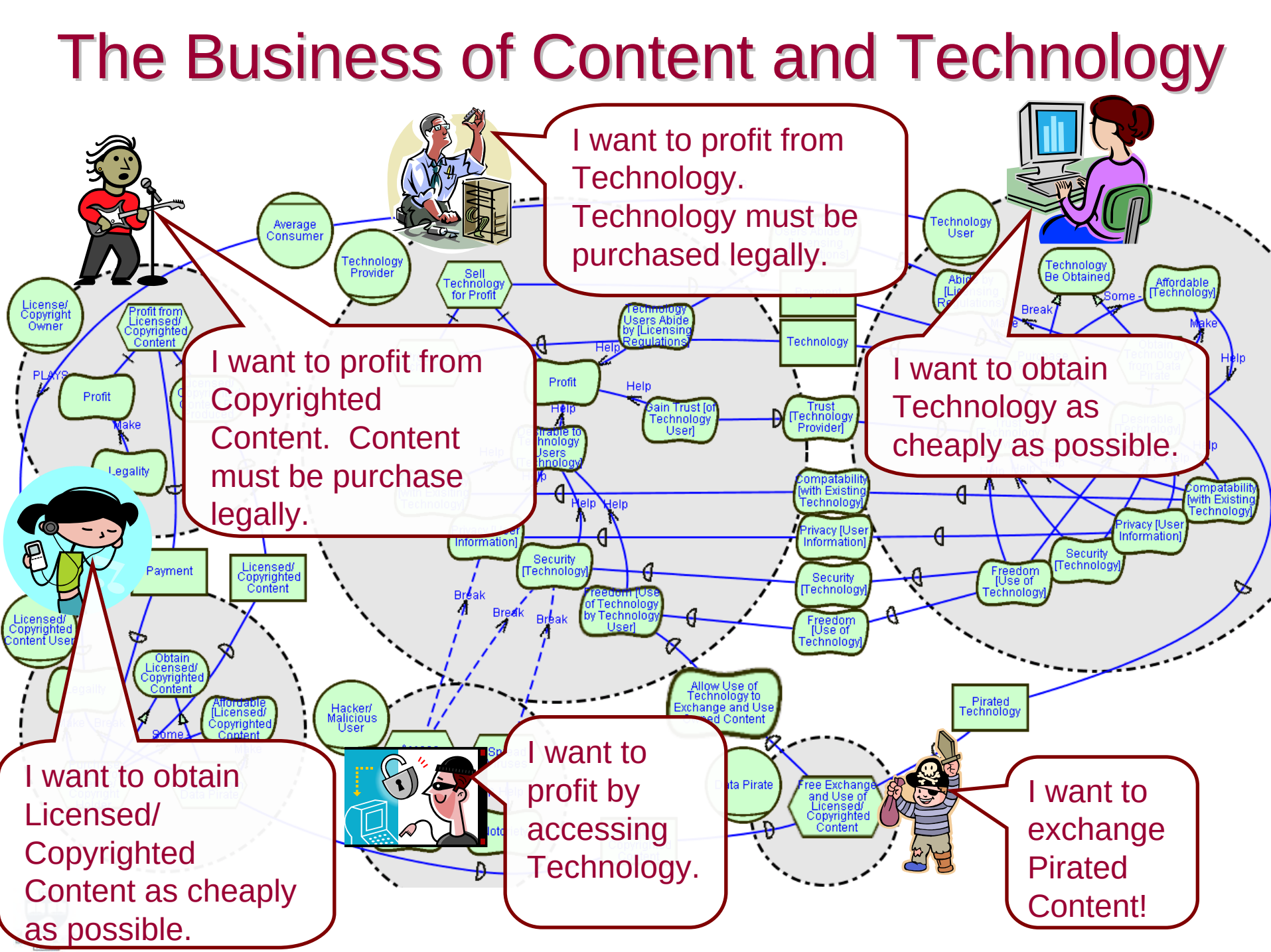


- Model the affects of TC according to opponents

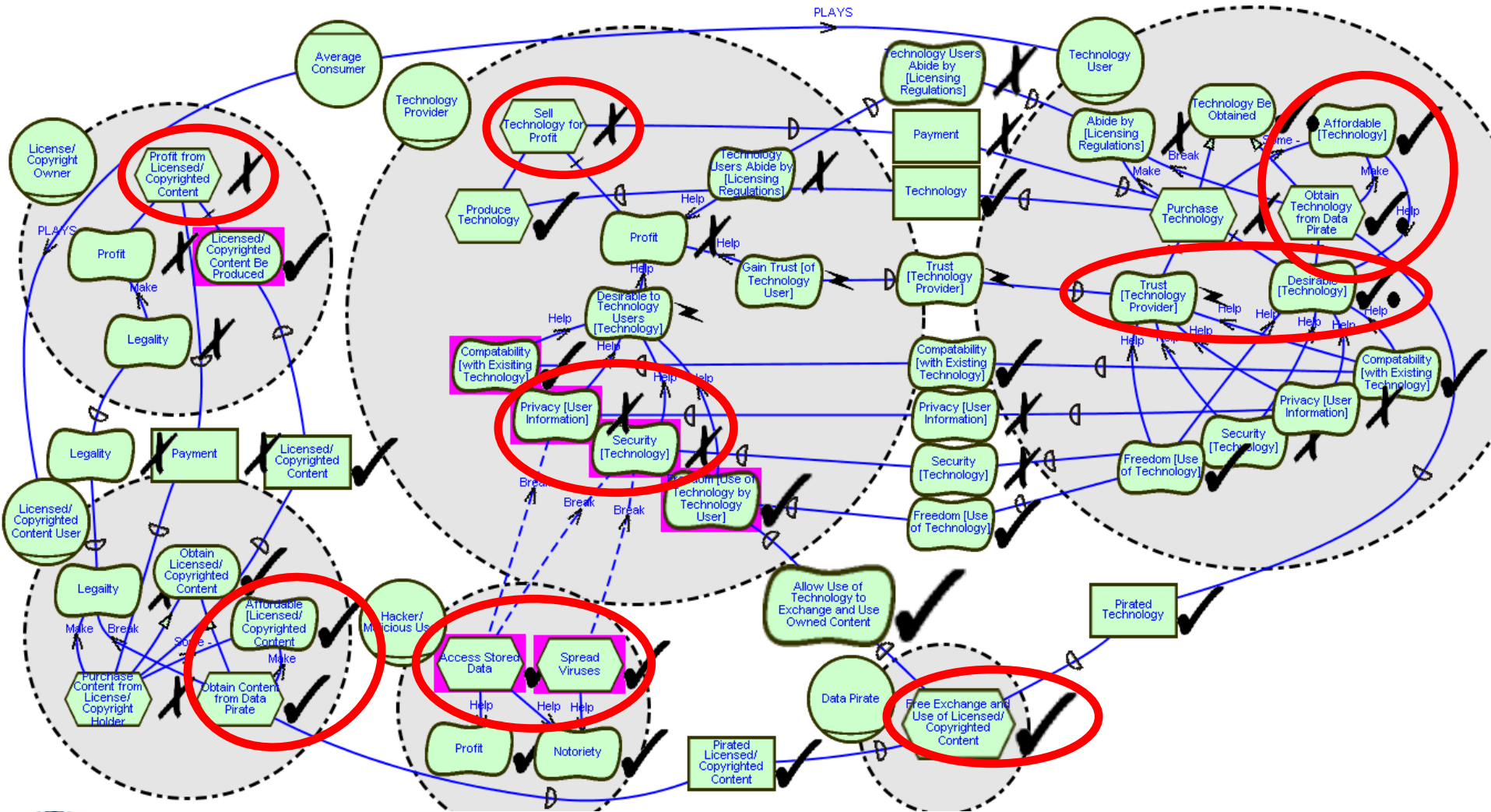
Case Study Sources

- Proponents: technical reports and FAQs of the TCG or TCG members.
- Opponents: an FAQ written by Anderson.
- All sources accessed in 2003 and 2004.

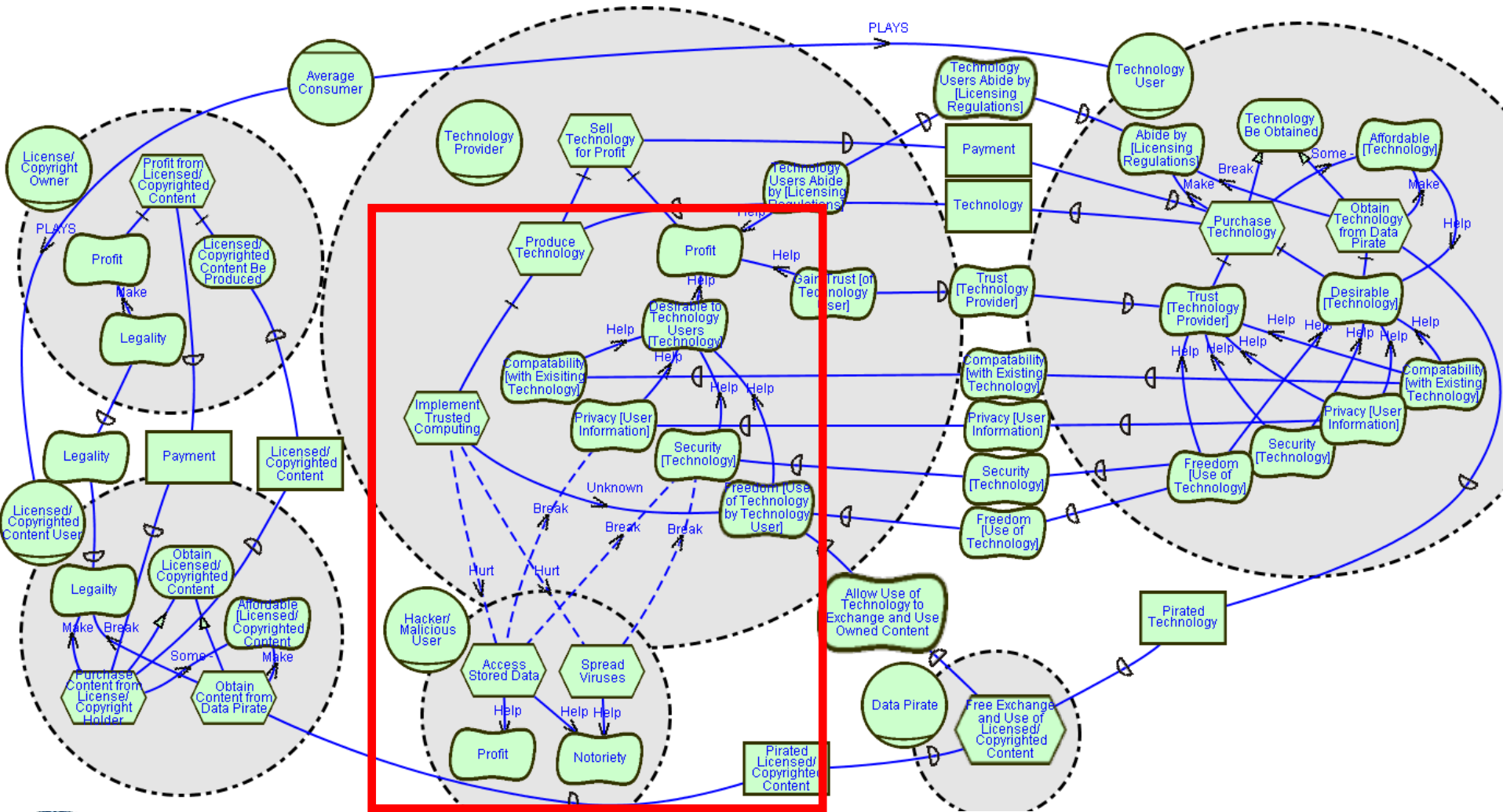
The Business of Content and Technology



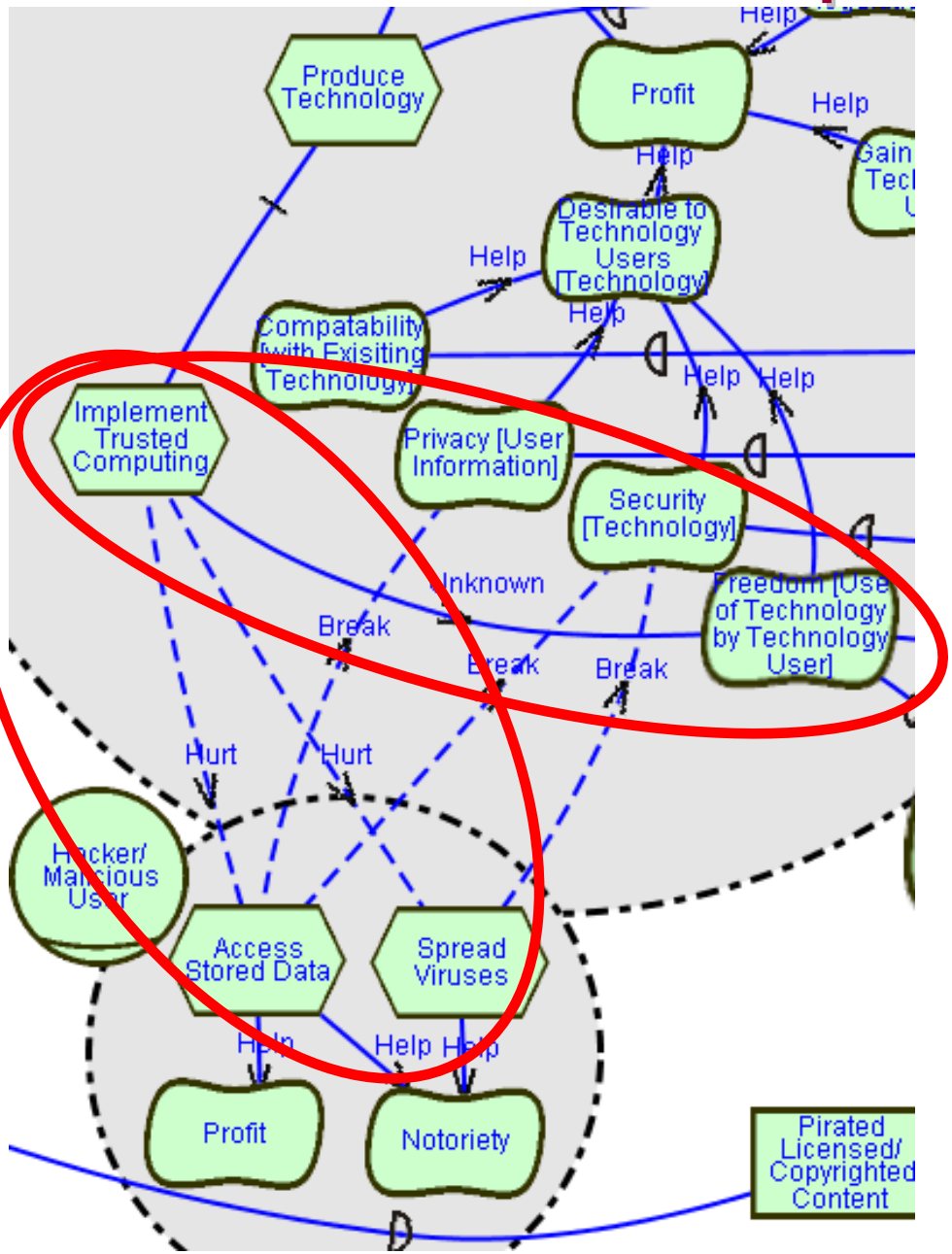
What can Evaluation reveal about this Situation?



Proponents of TC



How can TC Help?



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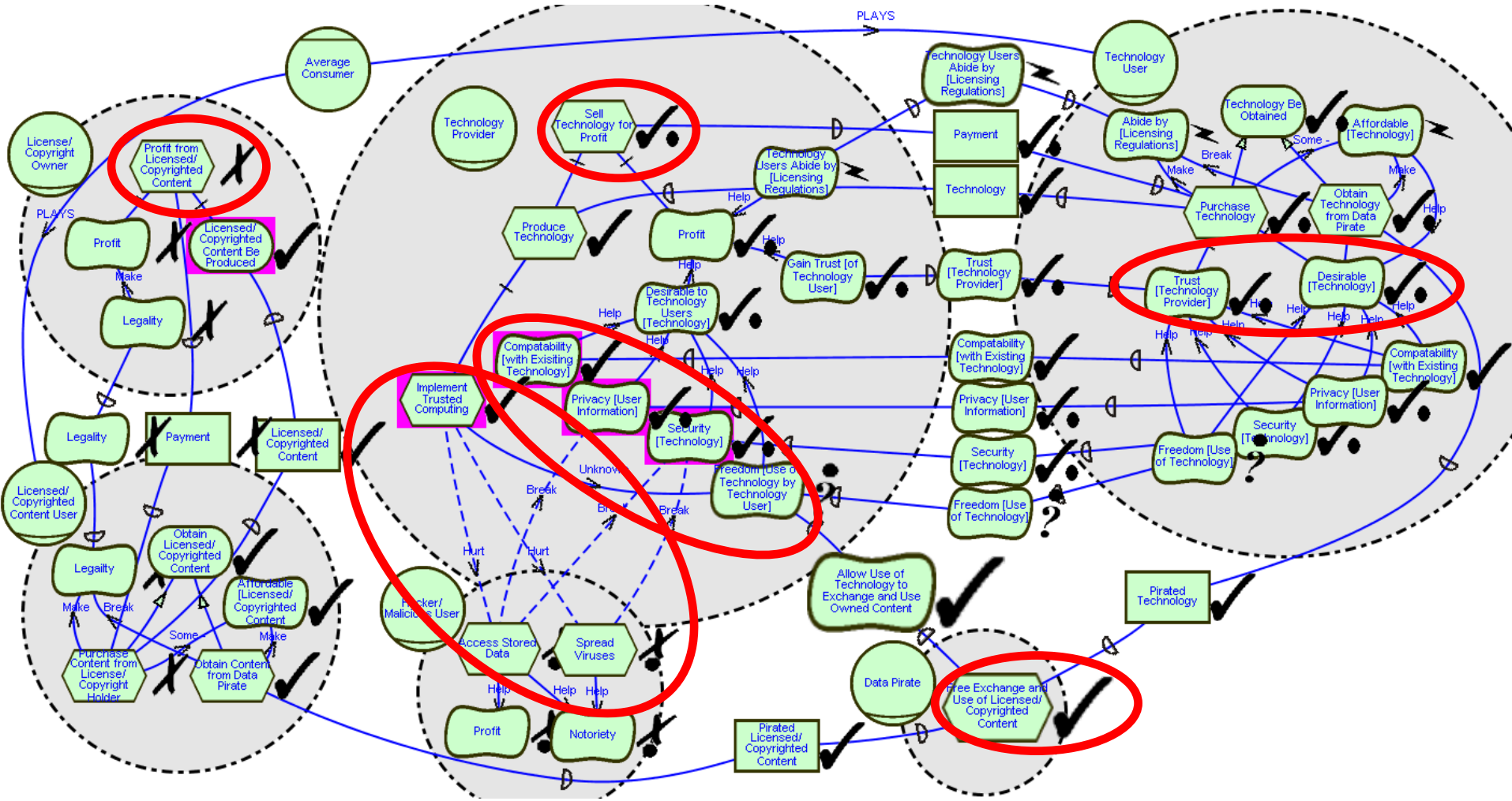
Will TC Work?



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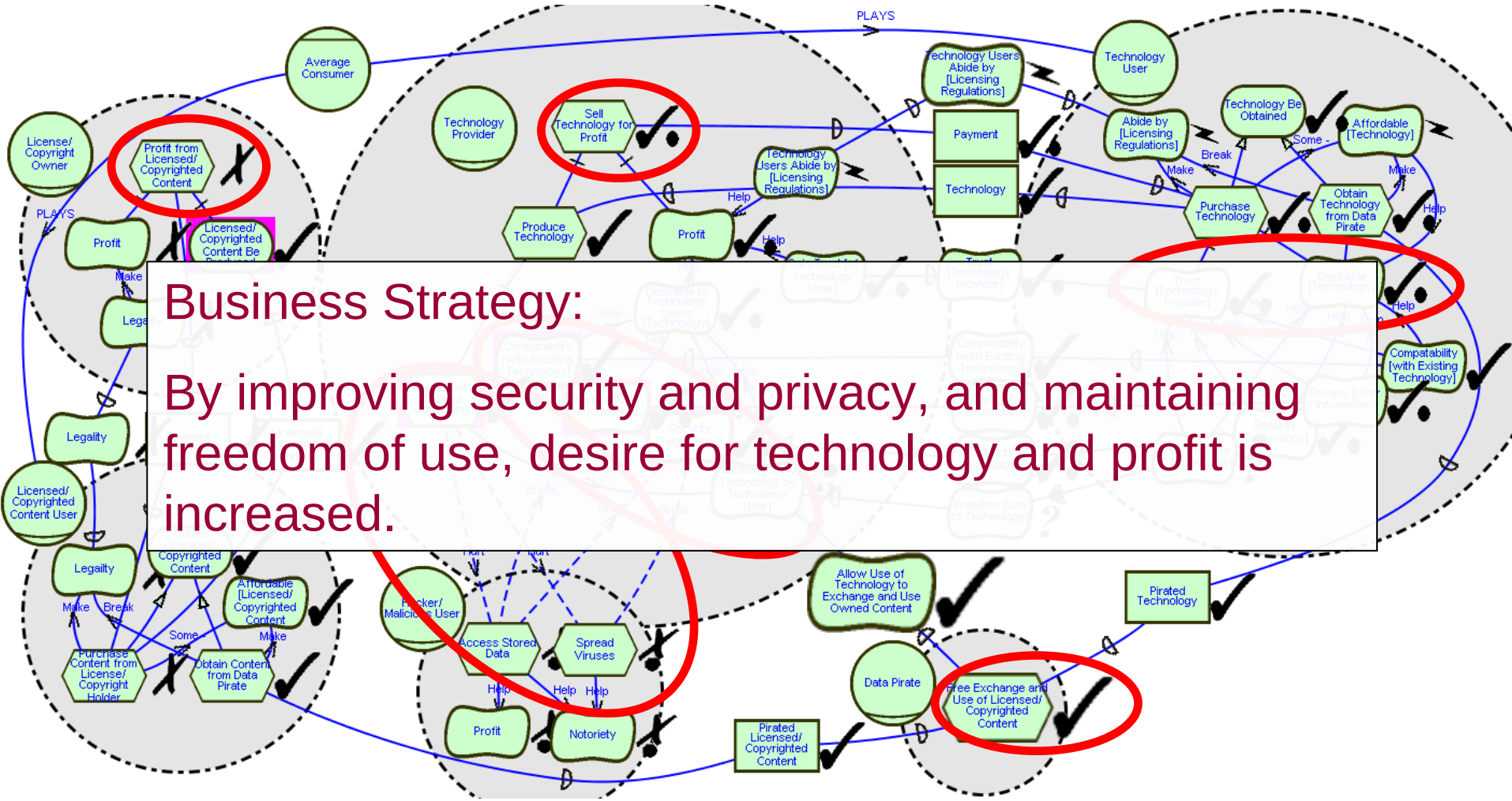

Business Strategy:

By improving security and privacy, and maintaining freedom of use, desire for technology and profit is increased.

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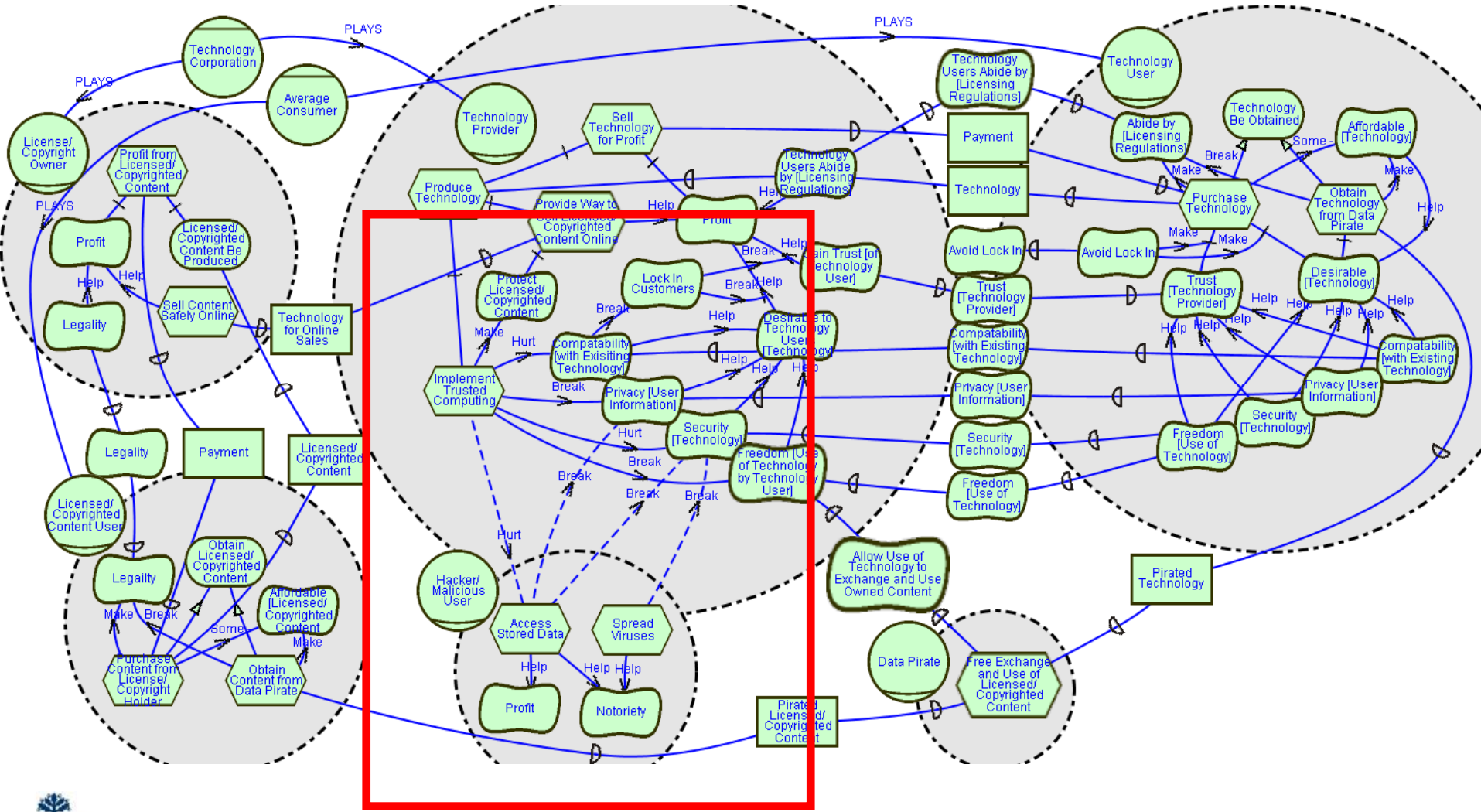
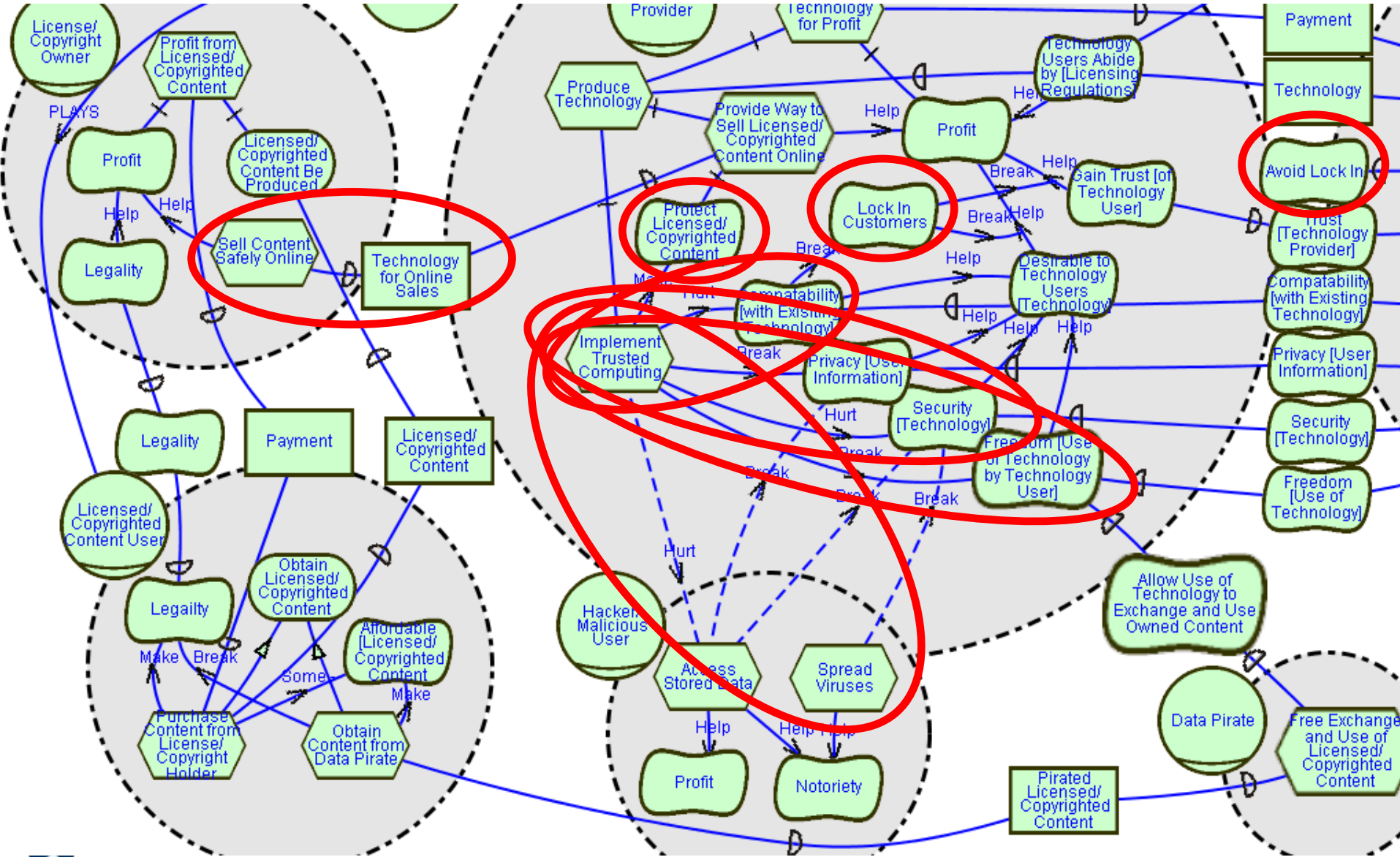
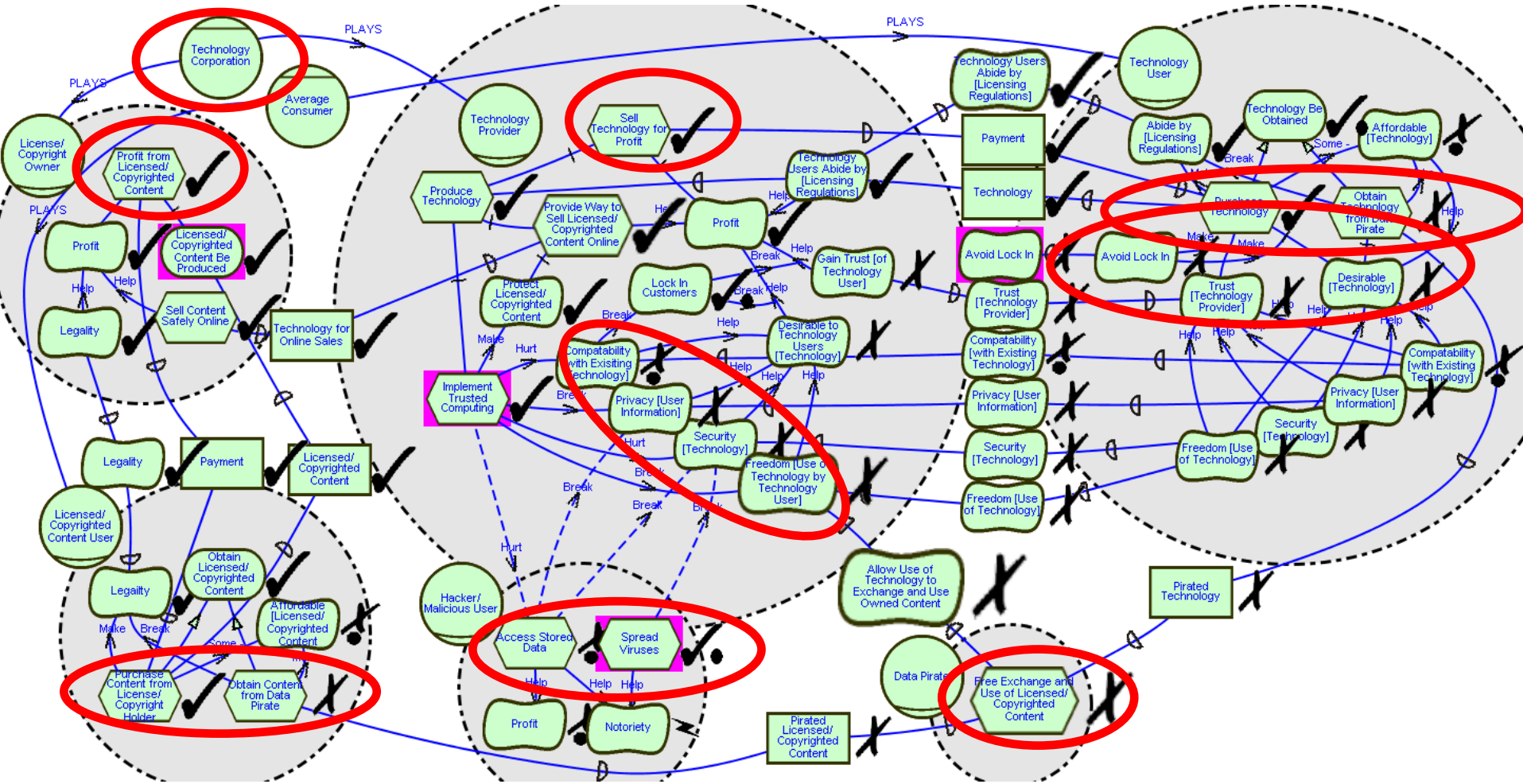
Opponents of TC



What does TC do?



How does TC Affect the Strategic Network?



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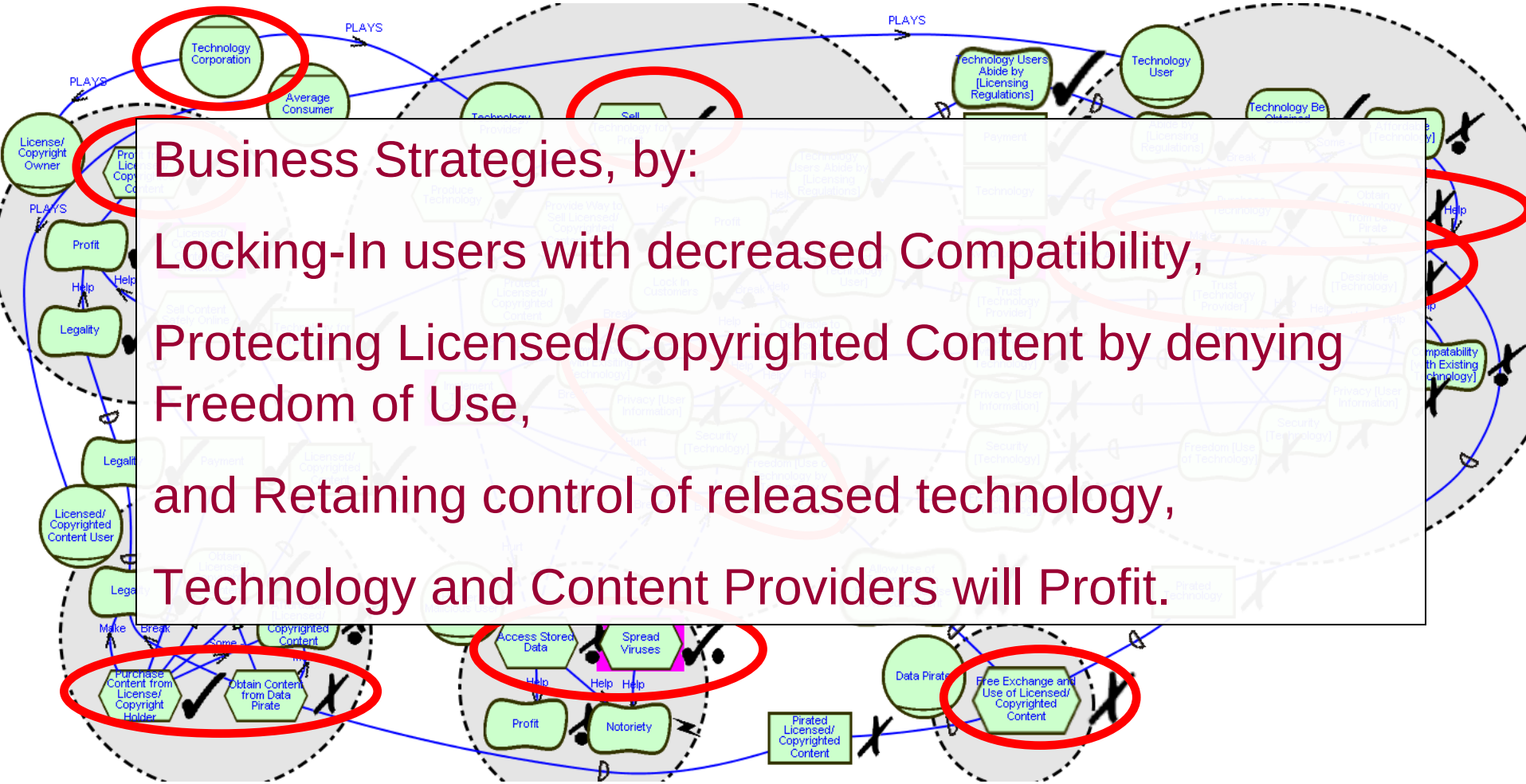


Business Strategies, by:

Locking-In users with decreased Compatibility,

Protecting Licensed/Copyrighted Content by denying Freedom of Use,

and Retaining control of released technology,

Technology and Content Providers will Profit.

Conclusions

- Intentional, social, conceptual modeling depicts the links between business strategy and technology implementations.
- This type of modeling allows impact analysis – answering “What if?”, “Why?”, “How?”, provoking an inquiry cycle.
- Modeling intentions allows the explicit depiction of conflicts between viewpoints.

Case Study Insights

- Modeling revealed results which were not otherwise obvious.
  - In the first version of the opponent model we asked: "Why would the Technology Producer implement TC when it makes technology less desirable for consumers?"
    - Further iterations showed that lock-in and DRM make it worthwhile
- Gaps or flaws in arguments became more apparent when modeled:
  - Does making Technology more desirable really reduce Piracy? (proponent model)
    - If not, how will the Technology Producer benefit from TC?

Related Work

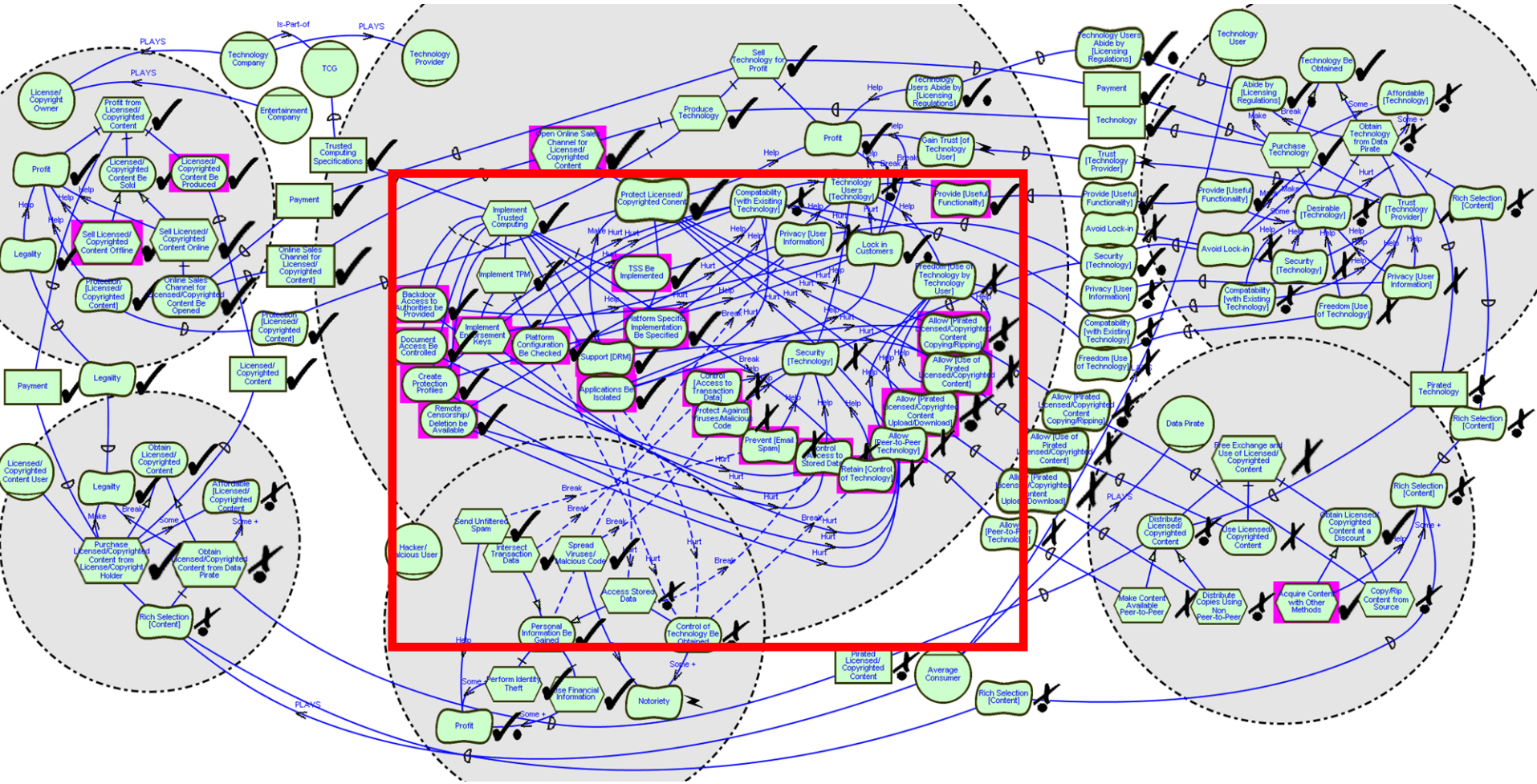
- We treat Trust as a softgoal, a qualitative goal without clear-cut criteria for success.
- This perception of trust in this work differs from previous work that treats trust as a measurable quantitative probability [Gambetta (ed.)] [Falcone, Tan (eds.)]
- In the Trust-Confidence-Distrust (TCD) Trust is represented in i* models using quantitative utility functions. [Gans et al.]

Limitations and Future Work

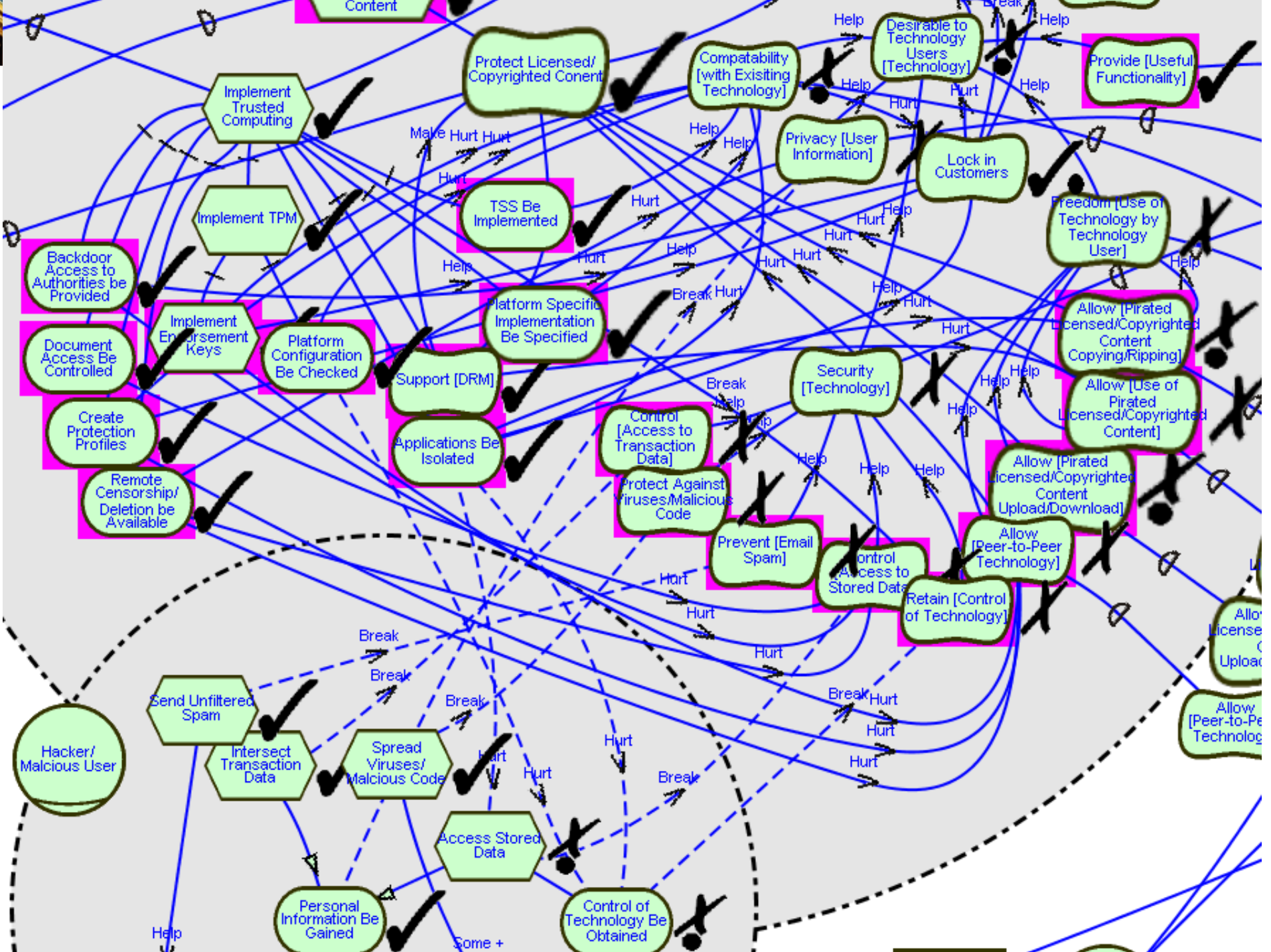
- Limitations:
  - Multiple sources combined together into only two viewpoints.
  - Does not fully explore the complex relationships between privacy, security and trust.
  - High-level, conceptual models are never fully complete or accurate.
  - Some elements are derived by the subjective interpretation of the modeler.

- Future Work:
  - Guidelines for methodology.
  - Scalability and “presentability” of i* models.

TC Opposition: Example Detailed Model



- Example: Scalability Issues


Content
Protect Licensed/ Copyrighted Conent
Compatability [with Exisiting Technology]
Desirable to Technology Users [Technology]
Provide [Useful Functionality]
Implement Trusted Computing
Privacy [User Information]
Lock in Customers
Implement TPM
TSS Be Implemented
Freedom [Use of Technology by Technology User]
Backdoor Access to Authorities be Provided
Platform Specific Implementation Be Specified
Allow [Pirated Licensed/Copyrighted Content Copying/Ripping]
Implement Endorsement Keys
Platform Configuration Be Checked
Document Access Be Controlled
Support [DRM]
Security [Technology]
Allow [Use of Pirated Licensed/Copyrighted Content]
Create Protection Profiles
Applications Be Isolated
Control [Access to Transaction Data]
Remote Censorship/ Deletion be Available
Protect Against Viruses/Malicious Code
Allow [Pirated Licensed/Copyrighted Content Upload/Download]
Prevent [Email Spam]
Allow [Peer-to-Peer Technology]
Retain [Control of Technology]
Send Unfiltered Spam
Hacker/ Malcious User
Intersect Transaction Data
Spread Viruses/ Malcious Code
Access Stored Data
Personal Information Be Gained
Control of Technology Be Obtained
Help
Hurt
Break
Make
Some +

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Thank you!

Questions?

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