# Artificial Intelligence and Intellectual Property Protection

## Perceptions of Intellectual Property and Brand Protection Professionals

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# Executive Summary

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Amid exponential growth in the use of artificial intelligence (AI), the Center for Anti-Counterfeiting and Product Protection (A-CAPP) and the National Intellectual Property Rights Coordination Center (IPR Center) conducted a multi-method study to explore threat and benefit perceptions of AI use in intellectual property protection among experts and professionals in the field.

## Risk-Benefit Duality

Participants perceived AI threats and benefits as a "double-edged sword." They indicated that AI poses a more prominent threat to publishing and creative arts than industries manufacturing hardware or other consumer products.

- **57% of survey participants** perceived AI as "an extreme threat to IP."
- **76% of survey participants** agreed that "the threat of AI to IP will significantly increase in the upcoming few years."
- **63% of survey participants** agreed that "AI is beneficial to IP protection."

## Knowledge Gap Regarding AI-Enabled Malicious Activities

Participants acknowledged that AI is introducing new challenges to IP protection, especially the way bad actors are using AI to infringe on IP. However, a considerable portion of these participants were not familiar with the harms inflicted by bad actors in reference to specific types of malicious activities and were even less familiar of their organization's capacity to combat those malicious activities:

- Participants were not familiar with the harms posed by **19% of AI-enabled malicious activities.**
- Participants indicated a lack of familiarity with **the defeat potential for 29% of AI-enabled malicious activities.**

## Organizational Readiness

Although IP and brand protection professionals agreed that AI poses a serious threat to IP and identified this issue as an evolving priority for their organizations, they indicated low levels of organizational readiness to confront the threats posed by AI to IP protection.

- **38% of survey participants** indicated that their organization is "not equipped" to mitigate AI threats to IP protection.
- Only **18% of survey participants** indicated that their organization developed an AI protocol, while **29%** indicated their organization **committed resources to mitigating AI threats** and **27%** indicated their organization **invested in educating their employees** about these threats.

## It's All about Enhancing AI Literacy

Participants indicated moderate levels of AI literacy, yet statistical modeling showed that higher levels of AI literacy positively predicted intentions use AI for IP protection by enhancing individuals' confidence level, among other technology adoption factors.

- Average AI literacy score of the survey sample was **4.15 on a seven-point scale**.
- The relationship between AI literacy and intentions to use AI for IP protection was enhanced by higher levels of **social normative perceptions and self-efficacy.** In other words, those with higher levels of AI literacy perceived that others in their environment are using AI and expressed high levels of confidence in using AI for IP protection, which in turn increased their readiness to incorporate AI into their IP protection work.

# Background

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With 23.49 million IP applications registered globally (WIPO, 2023), facilitating innovation while protecting IP is essential to realize the impact of innovation on economic growth, competitiveness, and creation and maintenance of IP-related jobs (Office of the United States Trade Representative, 2023). IP growth, however, comes with growth in IP violations and crimes committed by illicit actors, including: copyright infringement, trademark counterfeiting, trade secrets theft, and patent infringement (U.S. Department of Justice, 2018, United States Patent and Trademark Office "USPTO", n.d.). The volume, velocity, and veracity of IP infringement, particularly by bad actors, have been heightened by the proliferation of technology, especially with the recent growth in artificial intelligence systems, including generative AI. To address these complexities, the IPR Center partnered with the A-CAPP Center to explore the perceived AI threats and benefits to IP to inform a tailored training program for the IP and brand protection community.

As discussions around AI invade almost every aspect of business and law enforcement, AI has become a prominent point of discussion in the field of brand protection, both as a tool to combat IP infringement by bad actors, as well as a possible threat against IP protection. There is a delicate balance between recognizing the benefits of AI in enhancing IP protection processes and mechanics and combating the potential risks stemming from bad actors' leveraging of AI to augment their IP theft and infringement capabilities. Increased reliance and the exponential growth in use of AI, including generative AI, augments IP infringement risks, and complicates the work of IP protection. AI innovation is pushing IP boundaries in terms of defining IP, as well as the significant risks and potential benefits for IP protection; all of which is augmented by AI adoption and development velocity and veracity (Caldwell, 2023). For example, ChatGPT, OpenAI's conversational chatbot, set the historical record of reaching 100 million users in two months, while it took TikTok 2.5 years to reach that milestone (Hu, 2023). Collopy (2024) identified several opportunities for the use of AI in protecting IP, including detection and identification of IP infringement, which could reduce the need for human resources, improve decision-making processes, and enhance the accuracy and efficiency of IP protection work. Collopy (2024) also identified challenges of AI regarding IP, including training data quality and quantity, ethical concerns, the volume of IP infringement, and accuracy concerns in detecting IP infringement.

# DEFINING AI

We define AI as a system that was developed to mimic human intelligence (Chowdhary, 2020). Given the difficulty of precisely defining intelligence and the rapid evolution of AI technologies, what is considered to be "AI" is often contested. The fuzziness and lack of precision in conceptualizing AI, have also led the public to define AI, and thus perceive its benefits and threats through a fantasized notion of AI, often derived from science fiction (Hermann, 2023). It is estimated that about 26% of Americans predominantly fear AI (Liang & Lee, 2017). AI fear spans eight different dimensions, ranging from privacy violation, bias, job replacement, learning, risks, ethics violations, consciousness, and lack of transparency (Li & Huang, 2020). The strongest predictor of fear of AI (even beyond demographic characteristics) is exposure to science fiction media (Liang & Lee, 2017).

*AI is a system that was developed to mimic human intelligence*
(Chowdhary, 2020)

While many AI fears are founded (e.g., AI can and does demonstrate biased behavior), some fears may be overemphasized and are driven by what is referred to as the "Hollywood robot syndrome"—or the phenomenon where people believe AI may surpass human intelligence, making decisions its own and even causing humanity's extinction (Sundar et al., 2016). Zhan et al. (2023) found that perceived AI control or autonomy was the common predictor of the eight different types of AI fear, suggesting that users are worried that AI could take absolute responsibility and control, despite the reality that current AI technologies are mainly used to augment human decision-making (Jarrahi, 2018).

If the general public -not to mention policymakers- form their understanding of AI based on its depiction in science fiction, the real benefits and risks of AI technologies maybe obscured (Hermann, 2023). As AI becomes more prominent and widespread across industries, users must understand both its benefits and risks to ensure it is integrated effectively into people's lives and society.

# AI THREATS & BENEFITS:

## INSIGHTS FROM PREVIOUS LITERATURE

## What We Know About AI Threats

AI technologies pose a range of threats and potential harms, many of which can be better understood when positioned in specific contextual applications. Context-specific concerns stem from broader limitations of AI technologies.

### 01 | Lack of Transparency in AI Systems

The difficulty in interpreting the rationale behind AI's decision-making and deep learning models has resulted in the 'black box' metaphor, where ambiguity surrounds the comprehensiveness of input historical data, the process by which data are leveraged in these deep learning models, and the validity of the data output (Roselli et al., 2019; von Eschenbach, 2021). AI systems learn from vast amounts of data, typically historical data. Therefore, the quality and validity of the outcome of AI integration into IP protection depends on the quality of the data used by the AI system (input), the structure of the algorithm (process), and the accuracy of the outcome (output). Because AI models typically do not provide explanations for users to understand the input, process, and output of AI, it is difficult for users to develop trust and make informed decisions when using the technology.

### 02 | AI System Bias

Even with a careful review of datasets and algorithms, it may be impossible to delete unwanted biases from AI systems. Algorithmic bias may significantly impact IP protection. For example, AI may prioritize protecting content from well-known and larger companies and creators, leading to uneven enforcement and detection. This also poses an accessibility issue because only those with significant resources and visibility might receive IP protection.

### 03 | Evaluating Data Sources

The fact that AI systems need large amounts of data for their prime functioning also raises questions about the origins of the information used for training. For example, according to OpenAI, ChatGPT (Open AI, n.d.) is developed using three types of data: 1) information publicly available on the Internet, 2) licensed information from third parties, and 3) information that users and human

trainers provide. Even though AI companies typically use a filtering process for negative content like hate speech, publicly available data from the internet is rife with unintended biases that can negatively affect the output of the AI (Roselli et al., 2019). Furthermore, publicly available information may include copyrighted material (Quang, 2021), raising questions as to whether the use of this data by AI developers is protected under fair use laws and regulations. OpenAI and other tech companies are increasingly facing several lawsuits filed by news outlets, authors, and visual artists alleging copyright infringements (Brittain, 2024).

### 04 | Privacy Concerns

Loss of user privacy is another major concern (Shahriar et al., 2023), which is augmented by reliance on user data in systems like OpenAI that leverage multiple input sources to formulate outputs (Open AI, n.d.). Exposed data is not only vulnerable to misuse by bad actors, but may also have unintended outcomes. For example, AI models may unintentionally memorize information and disclose these details in future interactions (Blauth et al., 2022). Furthermore, the prevalence of AI incentivizes malicious actors to purposefully manipulate models and data, making them more prone to attacks. These actions are referred to as adversarial examples, which are "malicious inputs designed to fool machine learning models" (Kurakin et al., 2017, p.1), and influence training data to cause misclassification of material by corrupting that training process (Blauth et al., 2022).

## What We Know About AI Benefits

Like AI threats, AI benefits may be industry and context-specific. These benefits stem from AI's unique strengths, which should be analyzed from the perspective that in implementing AI in society, human participation in the decision-making process is a necessity.

### 01 | Augmenting Human Capabilities

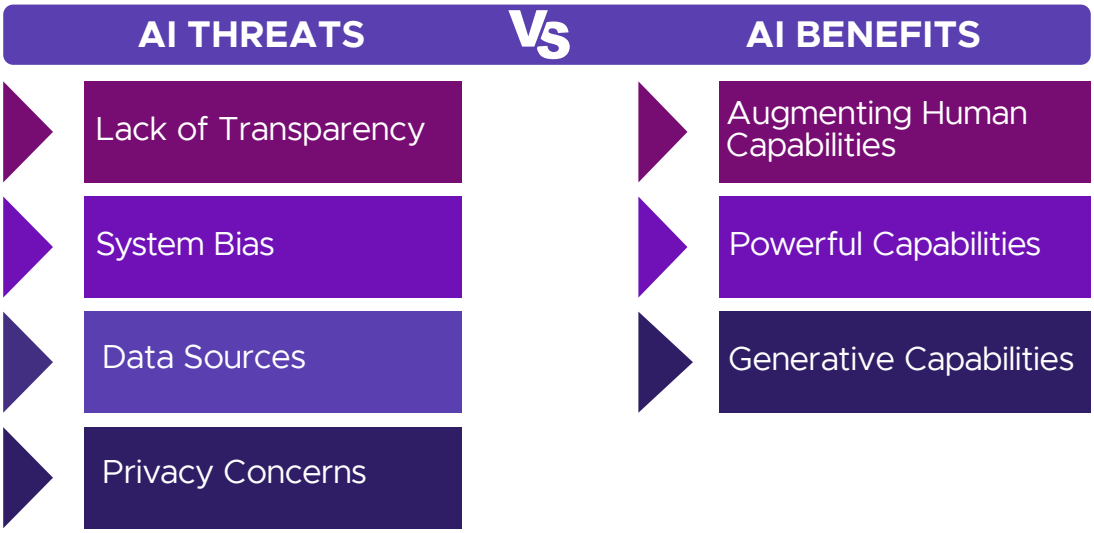
Rather than AI replacing humans, AI can augment human capacities. This perspective acknowledges that both AI and humans have strengths to maximize task effectiveness (Abbass, 2019; Sundar, 2020). For example, AI's speed and self-learning capabilities can help increase productivity and efficiency via automation (Maheshwari, 2023). AI can think faster and perform operations that humans cannot perform, while humans have contextual knowledge and creativity that AI often lacks. Thus, AI can enable the automation of monotonous tasks (e.g., monitor IP infringement, identify trends in infringement activities, automation of notices of infringement), while allowing humans the time to focus on tasks that require human ability and critical thinking (e.g., understanding of cultural, social, and contextual nuances about IP that AI may miss; drive the development of new tools and methods to manage IP protection).

## 02 | Powerful AI Capabilities

AI is trained with vast amounts of data allowing for smart and fast decision-making.
Predictive AI is being used in the health industry to help detect illnesses such as cancer or COVID-19 (Koul et al., 2023; Voth, 2005), and by content moderators to aid the detection of negative content such as hate speech or pornography (Lai et al., 2022). AI-based content classification is similarly being used for IP protection. Hernandez-Suarez et al. (2023) have proposed using text transformers and dense neural networks to detect the unauthorized distribution of content such as movies, music, and books. Deep neural networks for watermark detection have been proposed as an alternative for protecting high-performing AI models themselves from illegal copying and redistributing by malicious actors (Pattnayak et al., 2024).

## 03 | Generative Capabilities

Another benefit of AI comes with the advancements in Generative AI technologies.
While training GenAI with vast amounts of data available online poses privacy and IP concerns (Quang, 2021; Shahriar et al., 2023), it has also allowed the technology to learn and communicate accurately and closely mimick human communication. These improvements provide increased efficiency to businesses that leverage chatbots for customer service interactions (Verma & Kumari, 2023). In comparison to rule-based chatbots, GenAI chatbots can provide personalized interactions. These digital agents can also answer user queries quickly and accurately. The personalized, humanlike communication of AI-based assistants represents a significant shift in human-to-human interactions, as these systems now function as communicators— adapting to contexts, users, and messages—a role that has been historically unique to human interlocutors (Guzman & Lewis, 2020). As such, AI assistants can be employed in an array of contexts to help one write more efficient and personalized texts. In the context of IP protection, for example, GenAI chatbots can provide detailed reports and advice on steps to take when an IP infringement has occurred, or be used to send personalized messages to educate the public on the importance of IP rights and how to avoid infringing on the IP of others.



# A THEORY-INFORMED
## EXPLORATION OF AI THREATS & BENEFITS

We used the following theoretical frameworks to assess perceived threats and benefits.

## Fear Appraisal Theories

Kieslich, Lünich, and Marcinkowski (2021) leverage fear appraisal theories to define AI threat perceptions in relation to AI functions of recognition ("analyzing input data"); prediction ("prognose future conditions on the basis of analyzed data"); recommendation of specific actions; and, decision-making, where "AI system operates autonomously" (p. 1567).

## Malicious Attacks by Bad Actors

Mirksy et al. (2021) classified malicious AI attacks into eight categories, including automation, information gathering, credential theft, exploit development stealth, campaign resilience, and social engineering, where AI and cybersecurity experts reported high harm perceptions and low perceived potential for defeatability. While assessing risks is important, as indicated by Kieslich et al. (2021), threat perceptions might harm the potential for adoption, which is facilitated by cognitive withdrawal from recognizing AI benefits in fields like journalism and media.

## Social Psychological Perspective

Venkatesh (2021) argues that AI benefits are "still not well understood" (p. 641). Venkatesh (2021) drafted a research agenda applying the unified theory of acceptance and use of technology (UTAUT) to AI. UTAUT assumes performance expectancy (perceived benefits), effort expectancy (ease of use), social influence (perceived norms), and facilitating conditions (organizational capacity) to predict technology adoption and use (Venkatesh, 2021, p. 645). The current study extends UTAUT by highlighting the predictive role of field-specific literacy; AI literacy, in this case. Long and Magerko (2020) define AI literacy as "a set of competencies that enables individuals to critically evaluate AI technologies; communicate and collaborate effectively with AI; and use AI as a tool online, at home, and in the workplace" (p. 2).

# RESEARCH QUESTIONS

## THE CURRENT STUDY AIMS TO ANSWER THE FOLLOWING RESEARCH QUESTIONS:

1. What are the perceived threats and benefits of AI to IP Protection, as identified by IP/brand specialists, across IP domains, AI applications to IP, and malicious activities?

2. How do technology acceptance factors mediate the relationship between AI literacy and intentions to use AI for IP protection?

# Major Findings

# 01 RISK-BENEFIT DUALITY

## 1.1. General Perceptions

Generally, majority of participants agreed that AI both poses threats and provides benefits to IP protection, with the benefits slightly outweighing the threats. About six in 10 participants (57%) agreed that AI currently poses a threat to IP, whereas 76% agreed that it will significantly increase in the upcoming few years. In contrast, 63% of participants agreed that AI is beneficial to IP protection.

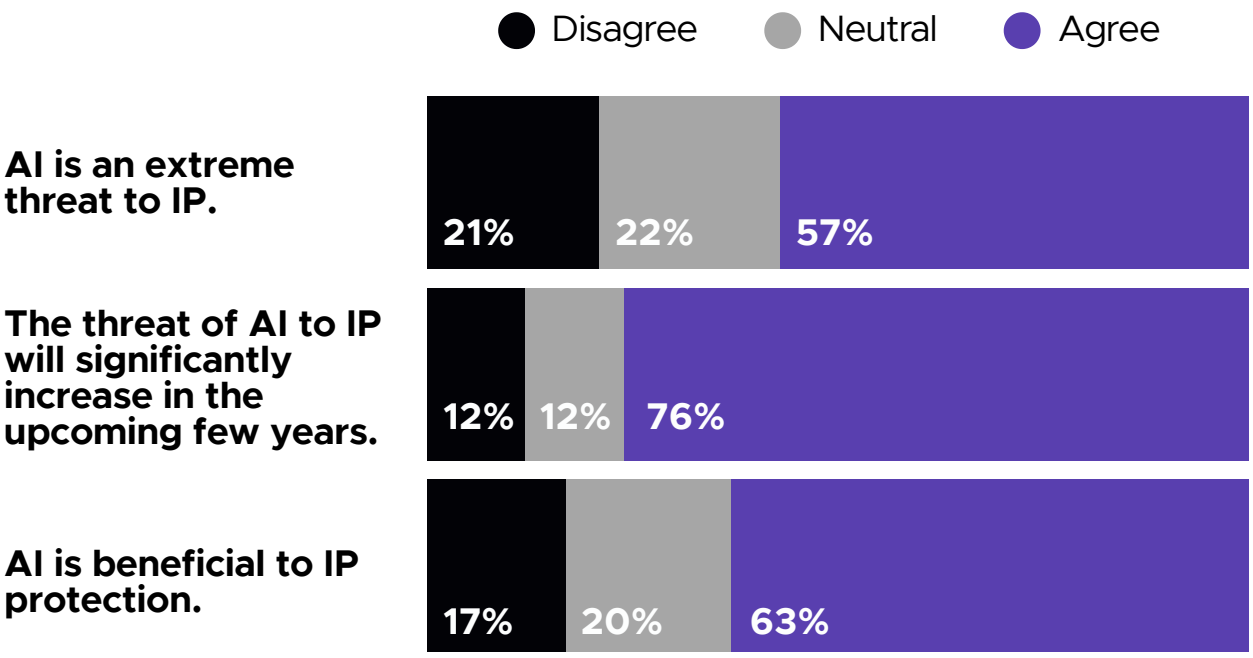



**FIGURE 1.1** Frequency of agreement responses to **general assessment of AI threats and benefits to IP protection**
*Frequency* was rated on a 7-point scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree." Responses were recoded: 1 - 3 = Disagree; 4 = Neutral; 5 - 7 = Agree.

# Interview Insights

## Just another tool!

Participants perceived AI as just another tool to complement existing technologies and practices for IP and brand protection. Such a perception is situated within a larger understanding of technological innovations and their applications within industry. Participants recognized that AI poses a set of accelerated challenges to IP protection, they were also hopeful that it presents significant opportunities when implemented strategically. Participants perceived AI threats and benefits as a double-edged sword. Participants also noted that currently AI might be a more prominent threat to publishing and creative arts than industries developing hardware or other consumer products. Cross-industry variability was detected. For example, participants perceived the great impact of AI on market assessment for consumer goods, technology service providers lauded benefits, supply chain operations are optimizing their processes by incorporating AI, while cybersecurity and legal experts had more pronounced concerns about AI.

## AI and IP Infringement

AI is seen as a significant threat due to its ability to recreate and duplicate content, making it harder to distinguish between genuine and counterfeit products. This includes generating high-quality counterfeit packaging, and mimicking trademarks. One participant highlighted that AI could be used to generate fake advertisements and to manipulate images, making it harder for consumers to detect counterfeits. Another participant mentioned that counterfeiters are now able to produce packaging that might look better than the original, making it challenging for even manufacturers to identify fakes.

**"AI it's another tool. Again, it's a tool, and I don't think I'm going to be stressing that enough because some people are thinking that AI is a person or an entity, and it's just a tool."**

*~ Participant 2*

**"AI will help us online, hopefully AI can data crawl, right? Maybe go on the dark web or see some of these things and start connecting people on the back end."**

*~ Participant 5*

**"[T]he counterfeiters are extremely good at marketing. They're better than the companies are because companies are trying to reach a broad spectrum of people, whereas counterfeiters know who they want. They want to get the people that are trying to get a deal and don't care about the quality of the product. And there are a lot of those people out there."**

*~ Participant 12*

# Interview Insights

## Legal and Regulatory Challenges

There is a consensus that current legislation is not fully equipped to handle AI-related IP violations, but there is optimism that laws will adapt over time. The need for proactive measures and stricter regulations is highlighted, especially in the context of online marketplaces where AI is used to create fake reviews and manipulate online ratings.

**"In some precarious way, we have what is needed to protect IP even from AI. ... But, Article 10 of the WTC (WIPO Treaty on Copyrights) talks about how members can allow certain uses of IP as long as the use does not affect the normal use, or 'does not unjustifiably prejudice the legitimate interests of the author.' ... This is very interesting because in reality, if you input some information to these AI systems that are online, the result you are going to get is not going to be always the same. And that is a problem for the enforcement."**

*~ Participant 2*

**"There is a consensus that current legislation is not fully equipped to handle AI-related IP violations, but there is optimism that laws will adapt over time"**

*~ Participant 10*

**"Right now, AI-generated works are in a legal gray area. The law hasn't caught up yet."**

*~ Participant 8*

## 1.2. IP Domain-Specific Risks & Benefits

When asked to estimate the threats and benefits of AI to specific IP domains of trademark, copyright, patent, trade secrets, security attacks, and market assessment, participants generally indicate low perceptions of both threats and benefits. However, participants indicate higher agreement with current AI threats than benefits. Specifically, 40% of participants agreed that AI poses a threat to copyright domain, followed by security attacks (39%), and trademark (31%), respectively. In contrast, the highest-rated agreement regarding current AI benefits to IP protection was reported in the domain of trademark (24%), followed by market assessment (21), and copyright (19%), respectively.

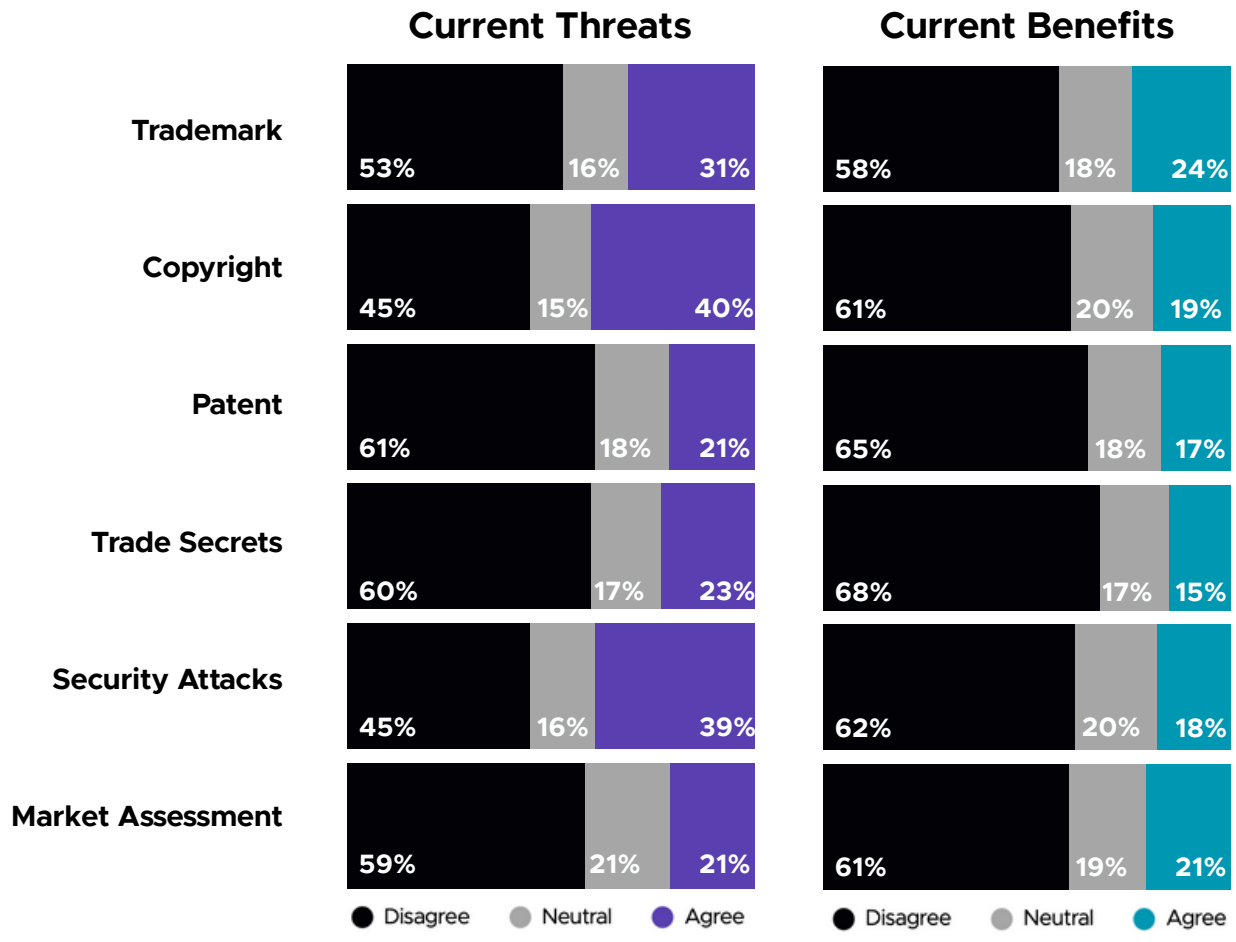



**FIGURE 1.2** Frequency of perceived **current AI threats (left) and benefits (right) to major IP domains**
*Frequency* was rated on a 7-point scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree." Responses were recoded: 1 - 3 = Disagree; 4 = Neutral; 5 - 7 = Agree.

# Major Findings

The gap between perceived threats and benefits shrunk when participants were asked to think about the future of AI. For example, 48% of respondents saw that AI could threaten copyright, followed by security attacks (44%), and trademark (41%), while 43% of respondents agreed that AI could benefit trademark domain, followed by copyright (42%), security attacks (29%) and market assessment (39%).

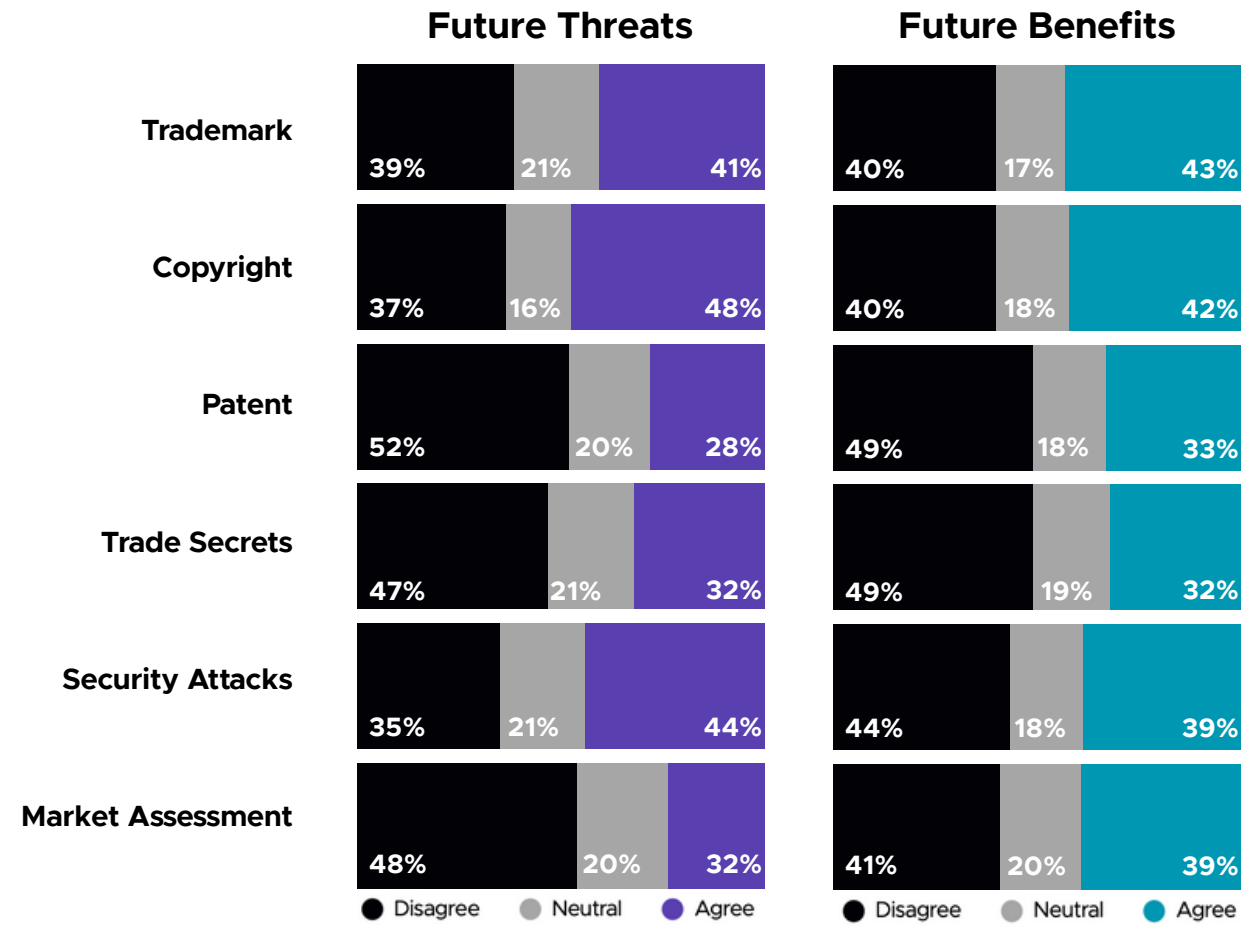



**FIGURE 1.3** Frequency of perceived **future AI threats (left) and benefits (right) to major IP domains**
*Frequency* was rated on a 7-point scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree." Responses were recoded: 1 - 3 = Disagree; 4 = Neutral; 5 - 7 = Agree.

# Interview Insights

## Threats to Publishing and Creative Arts

AI poses a significant threat to [IP domains] due to its ability to generate content that mimics original works, potentially leading to plagiarism and copyright infringement. Participants noted that AI can recreate books, articles, and other written content with such high accuracy and proximity to authors' writing style that AI-generated publications may be barely distinguishable from the original works of the authors.

Another major concern in publishing and creative arts is regarding content creators' use of AI. Publishers and agents find that creators can unknowingly violate AI regulations: One participant mentioned that artists may be unaware that AI-generated or AI-enhanced visual arts are not legally protected as original works, while another participant explained translators sometimes upload entire original works still in publication into large language model (LLM) chatbots to expedite their own translation process, unaware of their serious violation caused by "feeding" copyrighted work to the LLM.

One participant in the publishing industry emphasized the added possible threat of information shared by LLMs coming from unreliable sources such as rejected academic papers and journal articles, which can lead to the spread of public misinformation.

> **"The [USPTO] already ruled that if your material is generated by AI, it does not fall under copyright protection. If it doesn't fall under copyright protection, then you cannot license it basically because you don't hold the copyright to be able to license the copyright so that you can't sell it to publishers, you can't sell it for film rights. All those different things that I was saying, we were selling the rights to, you can't. So for my personal business, copyright is the cornerstone of the business, and so if something is fully generated by AI, we cannot then agent it out and manage it."**
>
> *~ Participant 7*

## AI Threats to Counterfeiting

The majority of participants see the threat of AI to IP as more relevant to market assessment and online sales than the actual manufacturing of counterfeit goods. Participants explained how AI can enhance counterfeiters' ability to create convincing fake advertisements and deceptive content, and shared instances where AI was used to manipulate images or generate realistic text and images, which enabled

> **"Fake listings powered by AI are manipulating consumer trust through fake reviews and misleading ads."**
>
> *~ Participant 8*

# Interview Insights

violators to create counterfeit product packaging that very closely mimicked genuine ones and hence, deceived consumers into buying the counterfeits online. Furthermore, participants noted the use of AI in facilitating the distribution of counterfeit goods through automation.

## Software and Algorithms

AI can be used to crack security measures and create derivative works that infringe on existing IP. Participants expressed concerns about AI being used to bypass authentication mechanisms and create counterfeit software.

**"Counterfeiters have gotten so advanced with AI-generated ads that some fakes now look better than the real product."**

*~ Participant 5*

**"AI is cracking software security in ways that make counterfeiting easier than ever before."**

*~ Participant 12*

**"Hackers are using AI to bypass authentication measures, making software piracy a growing problem."**

*~ Participant 4*

# Interview Insights

## Ethically Sourced Content

Responsible AI model builders who license original publications can create models that are both beneficial to consumers and fair to IP holders. Participants mentioned licensing deals in progress with AI-makers to use copyrighted content for training models while ensuring that the content is not displayed. This would help alleviate the issues of public misinformation because models would be trained on original, safeguarded information instead of low-quality or pirated data, which can compromise the integrity of the generated content.

**"We need to ensure AI models are trained on properly licensed content to avoid IP issues and mis-information."**

*~ Participant 8*

**"There's a push to create AI tools that only use pre-approved copyrighted content, which could be a good compromise."**

*~ Participant 10*

## Detection and Enforcement

AI tools leveraging computer vision and pattern recognition can significantly enhance the detection of counterfeit products and IP violations through their ability to verify the authenticity of products by scanning artwork and packaging, comparing the scans to a global strategic account manager in the field of brand protection for pharmaceuticals and medical devices.

Furthermore, the use of AI in analyzing large volumes of data to identify patterns and connections between different sellers and the ability to create risk profiles more efficiently, were highlighted by multiple brand protection professionals as potential benefits to help uncover counterfeit networks and detect signals of illicit trade.

**"AI is playing a role in tracking counterfeit networks and identifying patterns in their trade routes."**

*~ Participant 11*

**"AI will [play] a greater role in online brand protection."**

*~ Participant 4*

Another benefit that participants identified is automating the search for counterfeits online: A brand protection professional responsible for product security, data analytics, and market monitoring explained how AI can assist in monitoring online marketplaces and social media for signs of counterfeit activity, enabling quicker and more accurate enforcement actions.

## 1.3. Specific AI Capabilities for IP Protection

Participants were asked to evaluate the threats and benefits of AI to IP infringement and protection practices. With the exception of a single IP protection domain (forecasting), more than half of the participants agreed that IP poses a significant threat by facilitating IP infringement. Specifically, 64% agreed that AI poses a threat to IP protection by automating IP infringement, followed by threat to IP infringement detection (62%), and IP infringement identification (61%), respectively. In contrast, participants expressed higher perceived benefits of AI to IP protection. Specifically, they thought that AI is beneficial to detecting IP infringement (73%), identifying IP infringement (72%), and automating IP protection (65%), respectively.

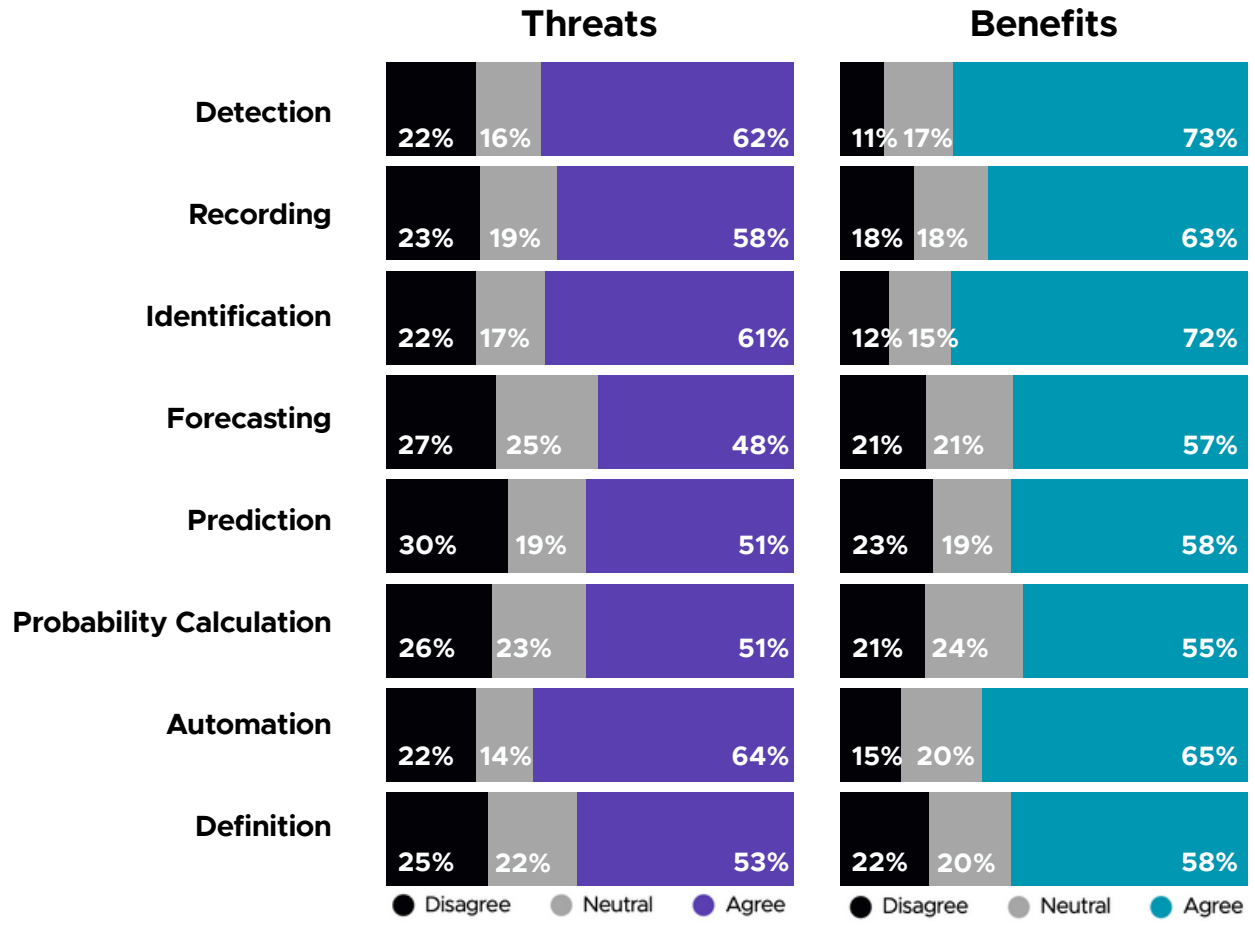



**FIGURE 1.4** Frequency of perceived **threats (left) and benefits (right) of AI capabilities as it relates to IP protection**
*Frequency* was rated on a 7-point scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree." Responses were recoded: 1 - 3 = Disagree; 4 = Neutral; 5 - 7 = Agree.

## AI Benefits Outweigh the Threats!

Participants significantly rated perceived benefits of AI to IP protection higher than the threats it poses across all functions of AI-enabled IP protection, with the exception of minor difference between IP infringement/protection automation and definition. The widest gap between benefits and threats was observed for identification (12%), detection (11%), and forecasting (10%), respectively.

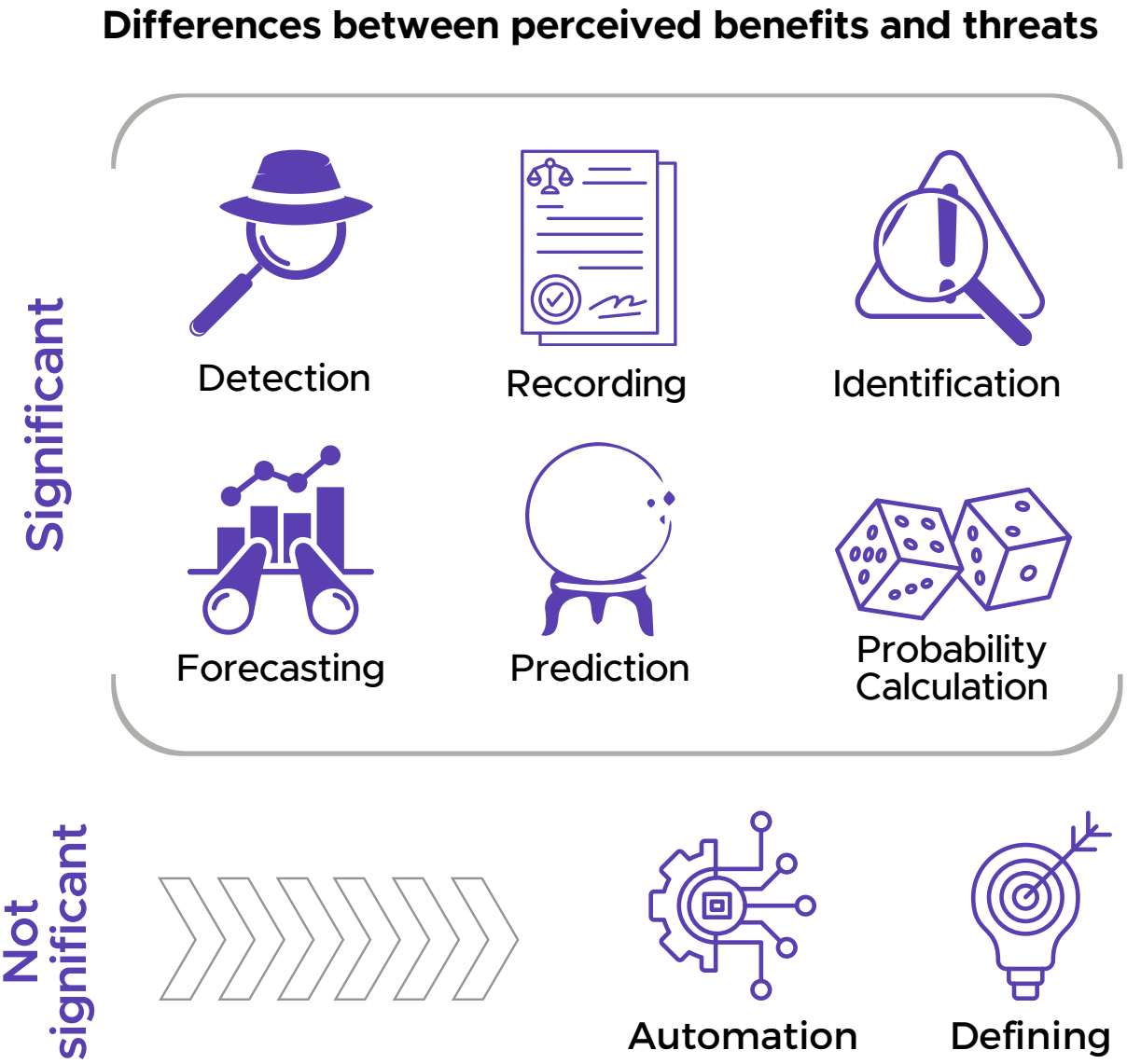



**FIGURE 1.5** List of significant differences between perceived benefits and threat of AI to IP infringement and protection capabilities, where benefit perceptions outweigh threat perceptions.

# Interview Insights

## Threats to Detection and Identification

AI's ability to recreate and duplicate content makes it difficult to distinguish between genuine and counterfeit products. This includes generating high-quality counterfeit packaging and mimicking trademarks, making it difficult for consumers and sometimes even professionals to identify them as "fakes."

**"AI-generated counterfeits are improving so fast that even professionals are struggling to tell real from fake."**

*~ Participant 8*

## Threats to Automation

AI can automate the distribution of ads and improve the quality of counterfeit product listings, making them more convincing to consumers. Participants noted that AI can be used to create fake reviews and personalized listings that are harder to detect.

**"Counterfeiters are using AI to automate their ad campaigns, making fake products appear more legitimate."**

*~ Participant 13*

**"AI is being used to optimize counterfeit listings, personalizing them to fool different buyers."**

*~ Participant 9*

## Threats to Defining IP Infringement

AI models trained on copyrighted materials, such as an author's published works, may give rise to IP violations that are difficulty to define and, therefore, to regulate. A content protection professional with 24 years of experience in the publishing industry described cases where LLM chatbots generate a summary, or a version of a publication that "resembles that original but is not exactly the same," as being in the gray area in terms of defining it as plagiarism.

**"LLM chatbots generate summaries that resemble original works but aren't exactly the same-making it hard to define as infringement."**

*~ Participant 7*

**"We are in a weird place legally because AI-generated version of real work exist in a gray zone."**

*~ Participant 10*

# Interview Insights

## Automation Benefits

AI can automate the search for counterfeits online, turning data into actionable insights and making the detection process more efficient. Participants mentioned the use of AI to filter search results and identify counterfeit products more quickly. One participant, an attorney specialized in counterfeiting, explained that there can be tens of thousands of online listings in only one month for one product that need to be taken down. This attorney stated that it is much more feasible to complete these takedowns with AI-facilitated automation in comparison to human effort.

**"AI has made counterfeit detection significantly faster by scanning thousands of listings in minutes."**

*~ Participant 8*

**"We use AI to sort through tens of thousands of counterfeit claims, allowing enforcement to act faster."**

*~ Participant 2*

## Detection and Identification Benefits

AI tools can identify patterns and markers in the marketing of counterfeit products, helping brand protection agencies to better detect and address IP violations, including the products' origin and distribution details. Further, AI can increasingly help analyze large volumes of images and detect discrepancies in counterfeit products. An experienced professional at a company that provides security measures and tools to brands explained how AI-facilitated identification tools such as phone apps can help not only brand protection professionals, but also customs and law enforcement, and even private consumers identify counterfeits.

**"By analyzing trade patterns, AI helps us predict and detect counterfeit operations before they spread."**

*~ Participant 8*

**"AI systems are learning to recognize patterns in fake product descriptions, helping enforcement get ahead"**

*~ Participant 8*

# 02 MALICIOUS ACTIVITIES

## 2.1. Perceived Harm & Defeat Potential

In our study, we evaluated specific IP-related risks across seven domains of malicious activity carried out by bad actors, encompassing a total of 33 distinct malicious activities. To quantify these risks, we asked participants to first rate the perceived harm and then the potential to defeat the different malicious activities. All the rating items included a "Not Familiar" option.


"Ability to automate complex tasks [...] to accomplish attack steps"

Use of data mining and language processing to "collect and distill actionable intel for a campaign"

Ensuring "infrastructure and tools have a long life" to "improve campaign resilience through planning, persistence, obfuscation, and detection of virtualization to avoid dynamic analysis."

"Side channels exploited with machine learning to obtain a user's credentials and vulnerabilities in AI systems used to avoid biometrics security"

"Targeting humans by exploiting their emotions and trust," where adversaries use AI to enhance the capacity "to exploit humans"

"Covert operations" that "use or abuse AI to evade detection"

Understanding "the content and inner workings of compiled software to (1) steal intellectual property, (2) share trade secrets, (3) and identify vulnerabilities that they can exploit"

**FIGURE 2.1** Definitions of major types of malicious activities enact with use of AI (Source: Mirsky et al., 2023)

## Perceived Harm

Participants were unfamiliar with AI's role in about 20% of malicious activities, with the greatest gaps in campaign resilience (27%), credential theft (24%), stealth (20%), and exploit development (20%).

**Unfamiliarity with Perceived Harm of AI-Enabled Malicious Activities**

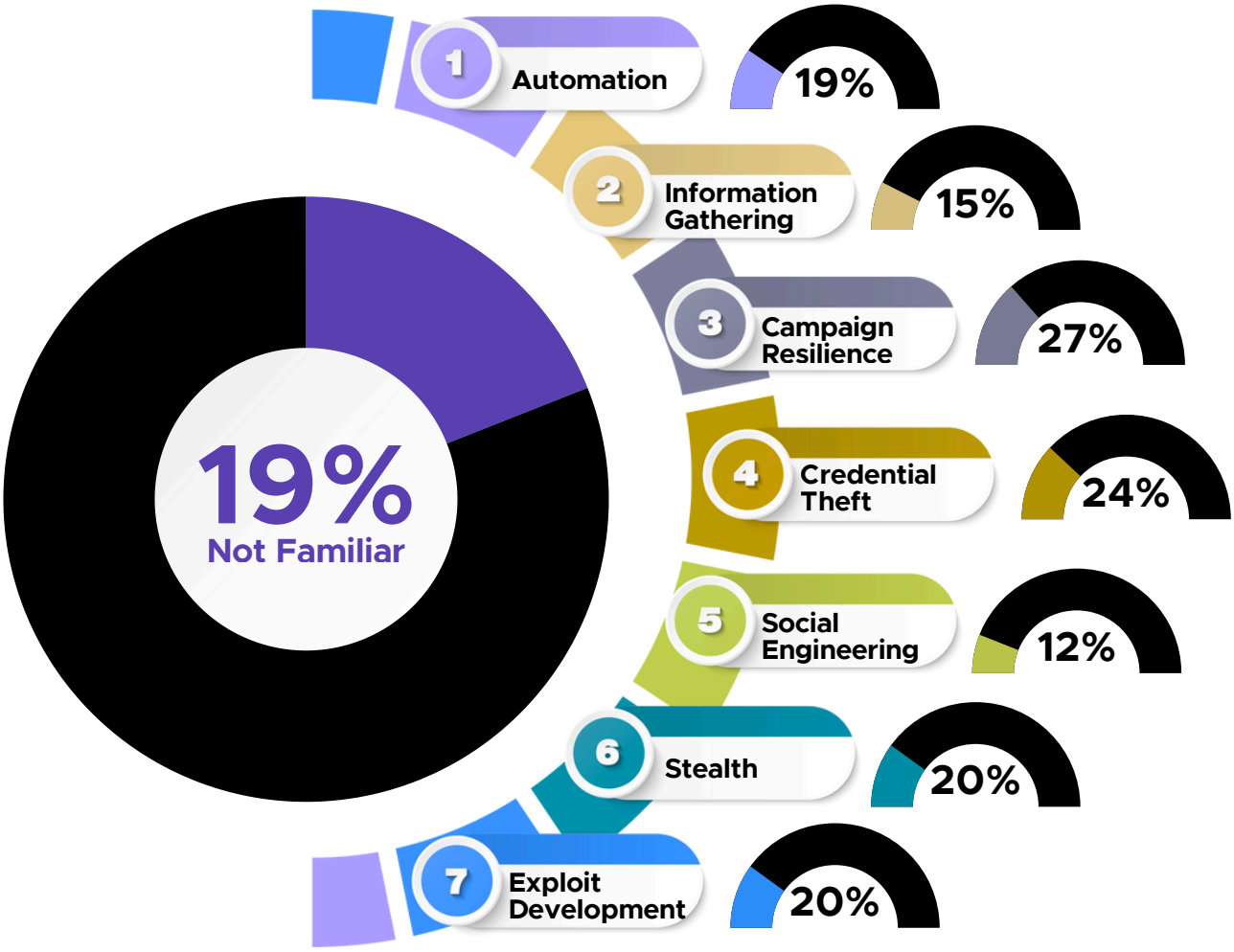



**FIGURE 2.2** Frequency of "unfamiliar" responses to evaluation of **perceived harm of AI-enabled malicious activities**, on average and per malicious activity category

## Perceived Defeat Potential

What's more, when asked about their perception of their own organization's potential to defeat those malicious activities, unfamiliarity rose to 29%, with the highest unfamiliarity reported for campaign resilience (35%), credential theft (32%), stealth (31%), and exploit development (31%).

**Unfamiliarity with Perceived Defeat Potential of AI-Enabled Malicious Activities**

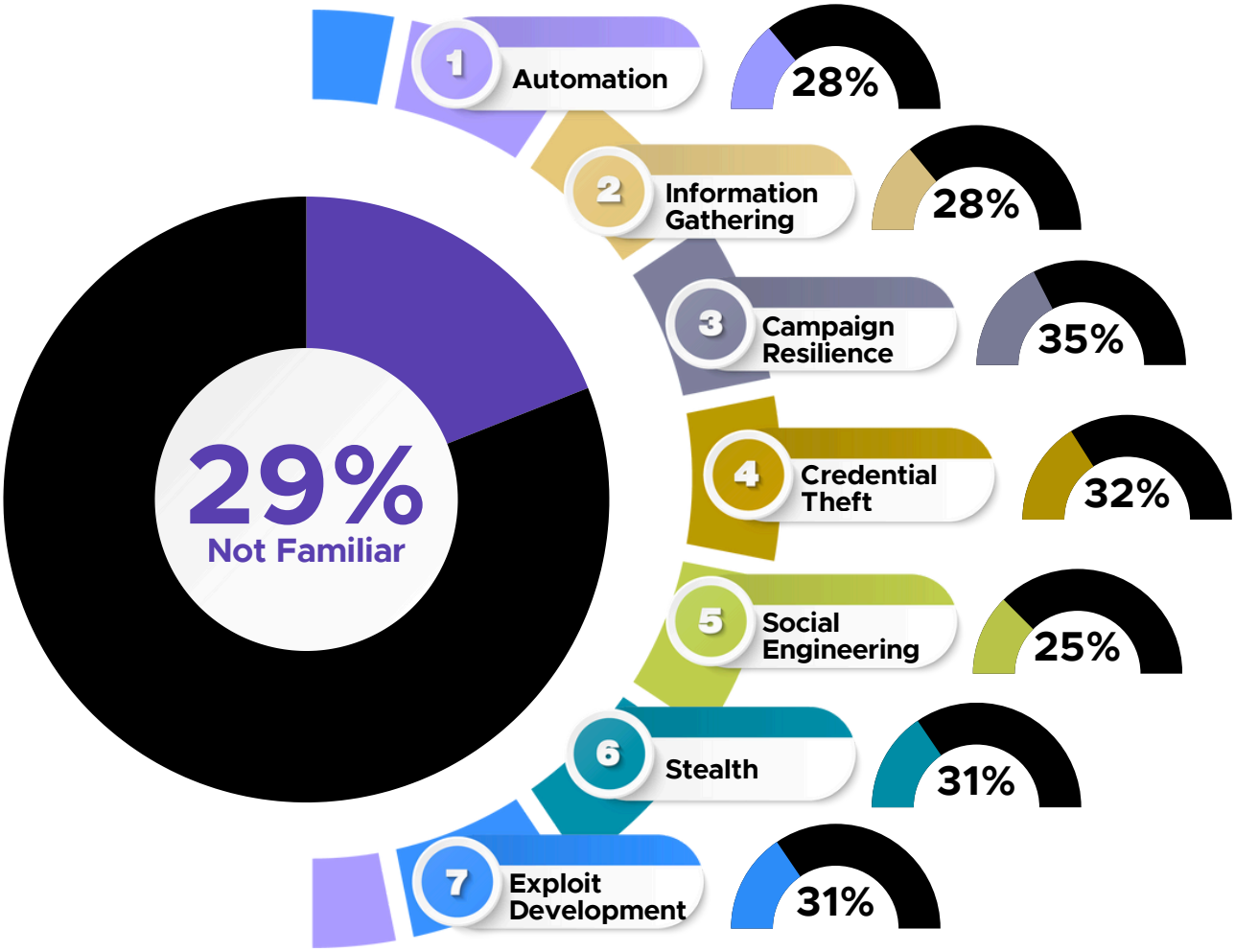



**FIGURE 2.3** Frequency of "unfamiliar" responses to evaluation of **perceived defeat potential for AI-enabled malicious activities**, on average and per malicious activity category

## Perceived Harm & Defeat Potential Ratings

In examining the means for evaluating potential harm and defeat potential, participants saw alarming levels of harm across the different types of malicious activities by bad actors. However, when asked to indicate their perceived defeat potential, the mean scores were significantly lower, indicating that participants could see the harms posed by AI in facilitating malicious activities, yet they were not as confident in both their individual and their organization's ability to defeat those malicious activities.

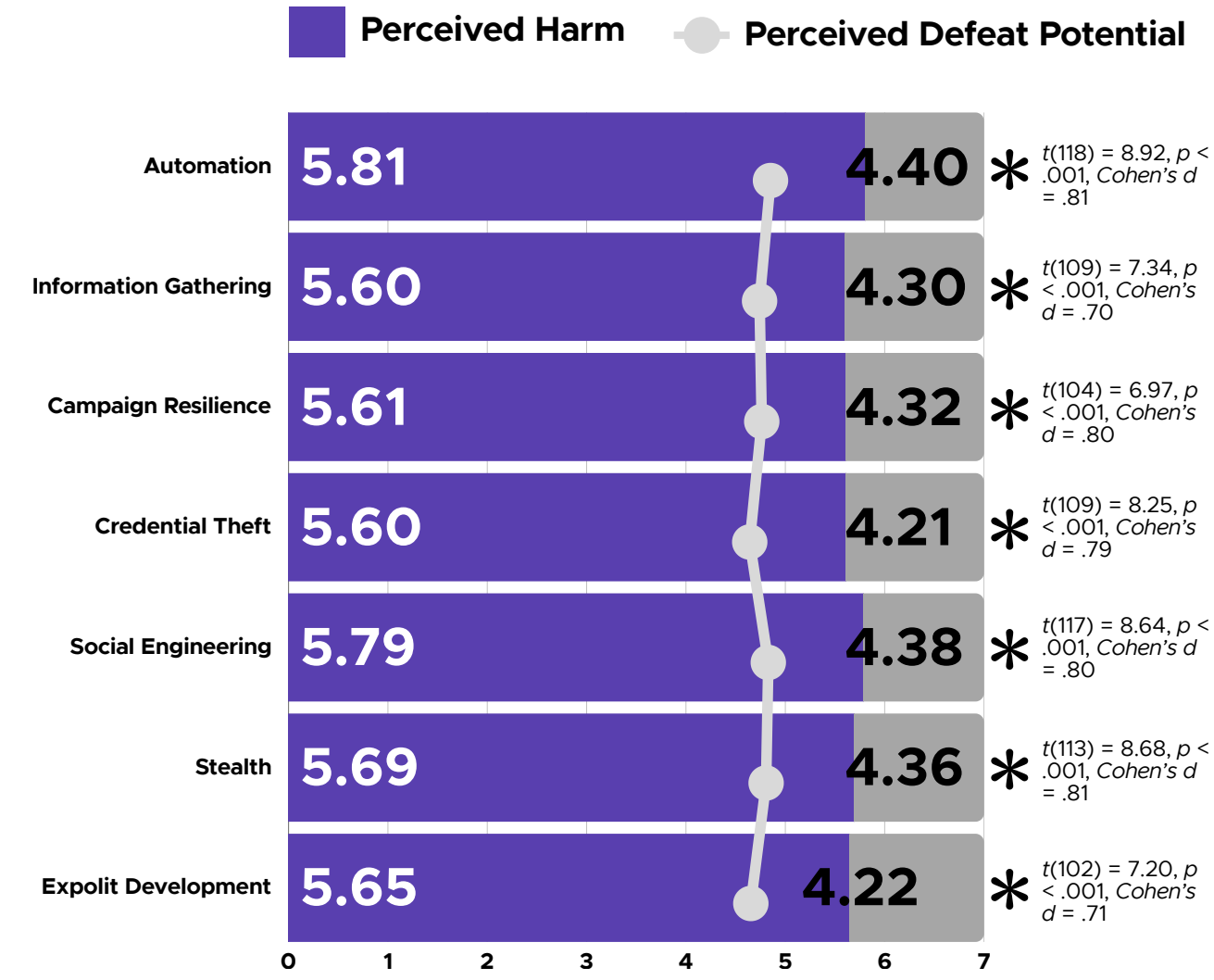



**FIGURE 2.4** Mean scores for perceived harm (bar chart) and defeat potential (line graph) for AI-enabled malicious activities
*Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")*

# Interview Insights

## Responding to Malicious Activities

The majority of participants acknowledged that AI is introducing new ways for both the creation and distribution of counterfeit products. These ways are as follows, in order of prominence as they were mentioned in the interviews:

1. Automated generation and distribution of content ranging from novels to online advertisements,
2. Enhanced resilience of counterfeit product campaigns through realistic listings, fake reviews, and manipulated online ratings,
3. Use of AI's stealth capabilities that allow counterfeiters to create harder-to-detect counterfeit material ranging from packaging to consumer goods,
4. Exploit development by illegally obtaining and sharing copyrighted content, and identifying vulnerabilities in online marketplaces,
5. Information gathering on consumer behavior via online data to create tailored, more convincing counterfeits and distribution methods,
6. Credential theft through convincing phishing material and websites that seemingly offer free content, such as free journal article databases.

**"Counterfeiters are using AI in sophisticated ways, from creating fake product pages to manipulating search rankings."**

*~ Participant 8*

**"AI-powered fake reviews are making it much harder to distinguish real products from counterfeits online."**

*~ Participant 13*

**"AI is being used in all sorts of different ways now, from generating counterfeit listings automatically, to creating manipulated search rankings that make it harder for genuine products to be found. We have even seen AI-generated fake reviews that look indistinguishable from real ones, and they are being used to deceive consumers at scale."**

*~ Participant 11*

## 2.2. Consequences of AI

Figures 2.5 and 2.6 show ratings on a seven-point scale with regard to the participants' perceptions of the impact and consequences of AI within the IP and brand protection fields. The top five areas of consequences included: compromised consumer private data and information, harm to digital security and safety, legal risks, increase in international organized crime, and increase in acquisition of counterfeits, respectively (Figure 2.5). It is also worth mentioning that the lowest rated area of impact was the potential for AI to decrease innovation (Figure 2.6).

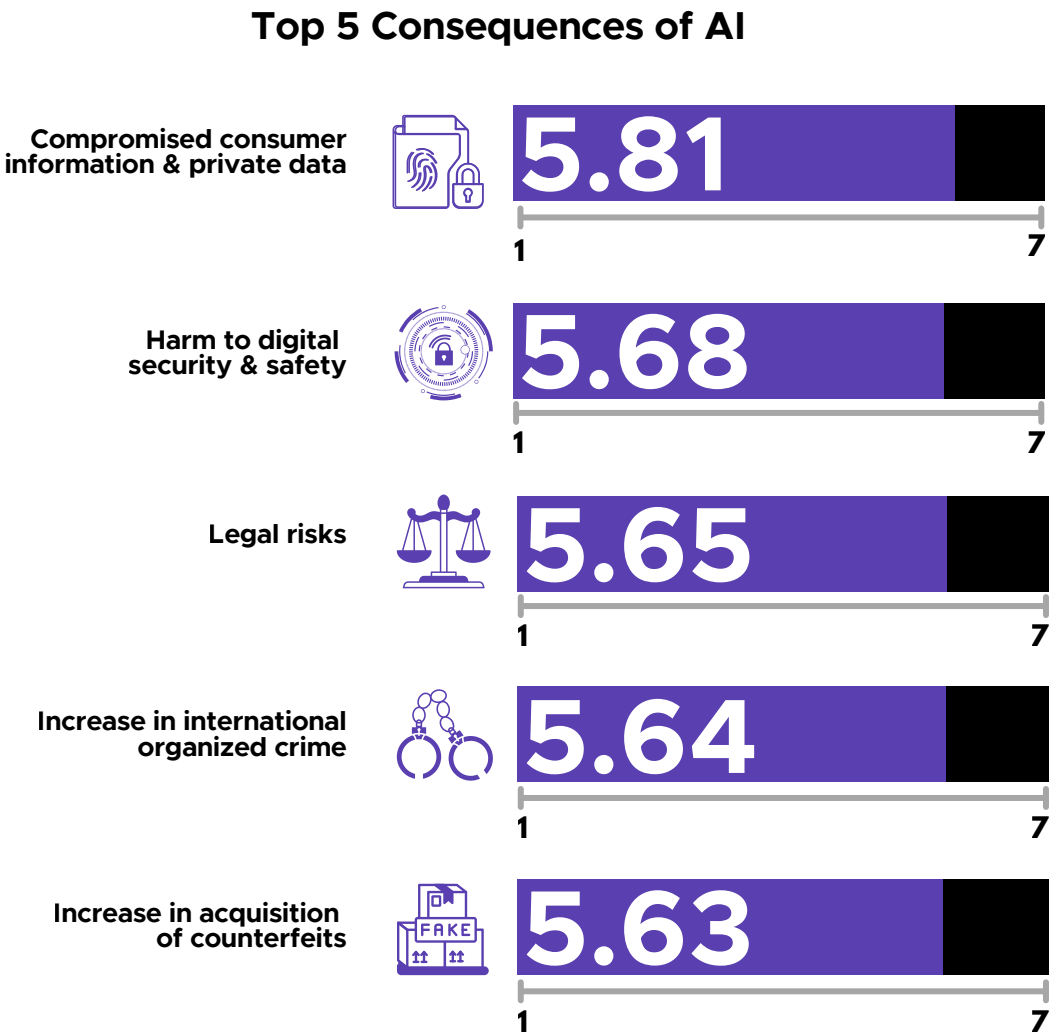



**FIGURE 2.5** Mean scores for the Top 5 most rated consequences of AI to IP protection
*Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")*

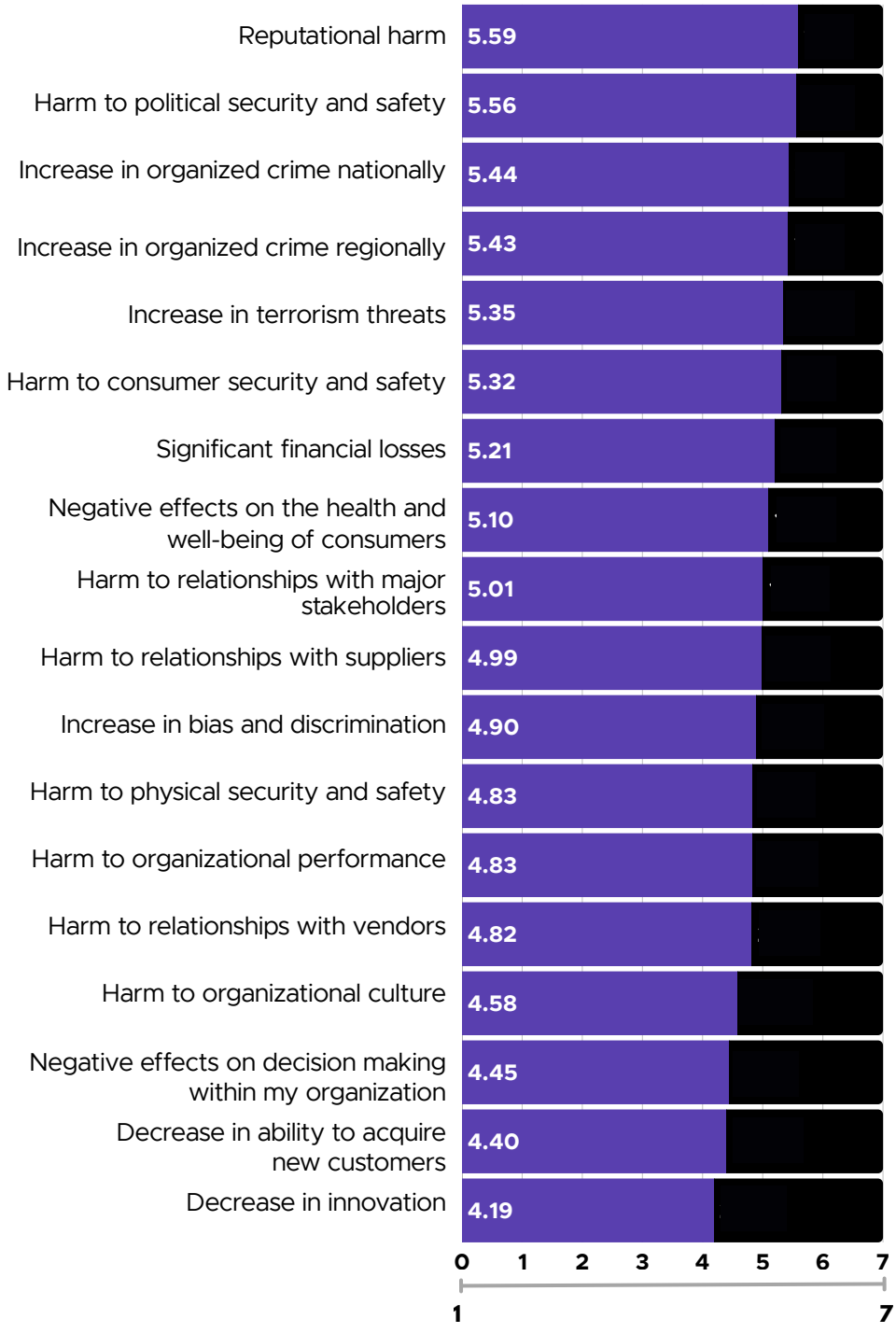



**FIGURE 2.6** Mean scores for the other perceived consequences of AI to IP protection
*Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")*

## 2.3. Who Is Most Impacted?

Participants indicated that brand owners, e-retailers (social commerce and e-commerce), and law enforcement and investigations are the top entities that will be directly impacted by the advances in AI technology and its use for IP infringement.


**FIGURE 2.7** Mean scores for rating of IP protection stakeholders impacted by AI
*Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")*

# Interview Insights

Although the increasing use of AI in both IP violations and IP protection reshapes practices in IP field, reshaping the work of stakeholders across the field — including legislators, attorneys, law enforcement, and customs officers. Interviews with professionals further highlight the significant impact on the following IP owners:

- **Copyright owners in creative industries:** Authors, illustrators, and other creatives are significantly impacted by AI's ability to generate content that mimics their work. Participants in the publishing industry noted that AI can recreate books, articles, and other written content with a high degree of accuracy, raising concerns about plagiarism and copyright infringement.
- **Brand owners in consumer goods manufacturing:** Manufacturers of consumer goods, especially those in high-risk industries like pharmaceuticals and automotive, are impacted by AI-enhanced counterfeiting. Participants highlighted the use of AI to generate counterfeit packaging and automate the distribution of counterfeit goods.

# 03 ORGANIZATIONAL READINESS

## 3.1. Taking Actions to Mitigate AI Risks

Participants expressed a high level of organizational awareness of AI threats to IP, both as a strategic priority and a serious threat (see Figure 3.1). Yet, when asked to indicate what their organizations are doing, responses showed low levels of organizational practices to mitigate the risks of AI and leverage it for its benefits to IP and brand protection (see Figure 3.2). Nearly four in 10 participants expressed that their organizations are not equipped to handle and mitigate AI threats. At the same time 29% of participants indicated that their organization has committed to investing resources for better AI integration into IP and brand protection as well as 27% who indicated their organization invested in educating the staff about AI. Only 23% participants indicated that their organization developed a plan for mitigating AI threats, while 18% indicated they had a protocol. Finally, 20% of participants indicated their organization hired experts and roughly 12% indicated that the organization contracted a firm to manage AI threat mitigation.

**My organization/client recognizes AI threats to IP as a/an...**



**FIGURE 3.1** Mean scores for evaluation of AI threats as evolving priority and a serious threat. Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")

**To handle and mitigate AI threats, my organization/ client has...**

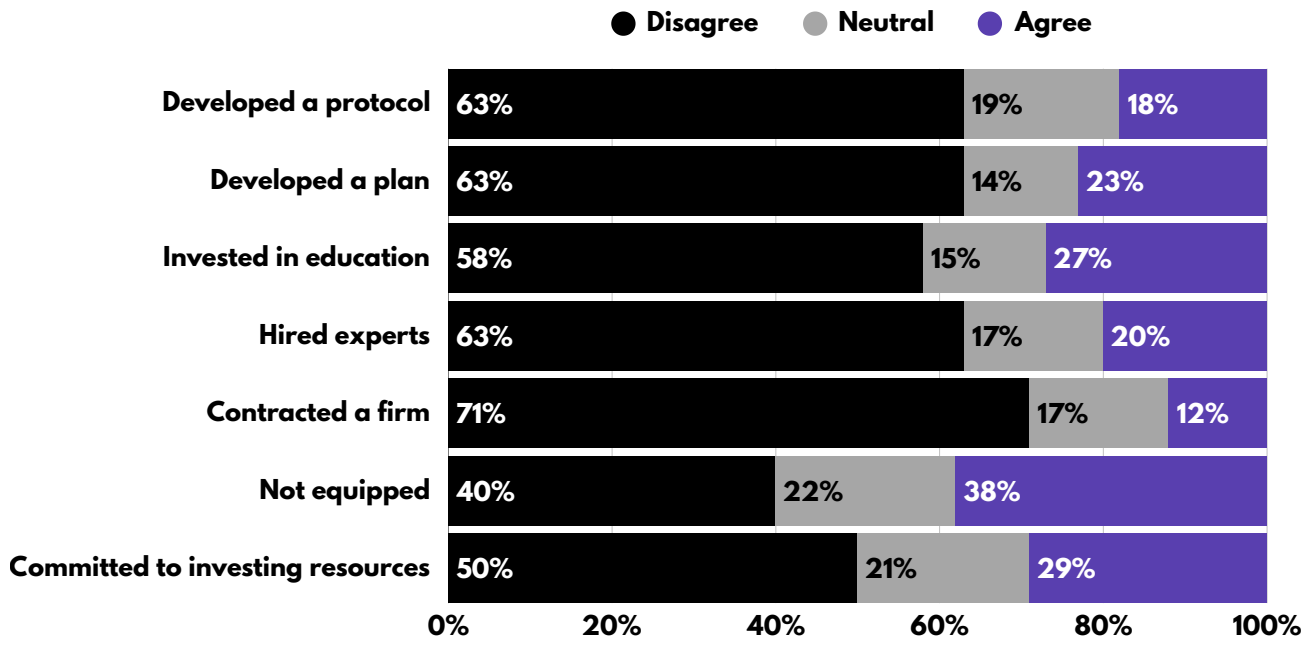



**FIGURE 3.2** Frequency of organizational actions taken to mitigate risks of AI to IP protection. *Frequency* was rated on a 7-point scale where 1 = "Strongly Disagree" and 7 = "Strongly Agree." Responses were recoded: 1 - 3 = Disagree; 4 = Neutral; 5 - 7 = Agree.

## 3.2. Use of AI Tools for IP Protection

A quarter of participants (23%) indicated that their organization/client is currently using AI-powered technologies for IP and brand protection, compared to 38% who said their organization is not currently using any such technologies. More importantly, 39% said they were not sure whether their organization/client is using any AI-powered technology for IP and brand protection.


**FIGURE 3.3** Frequency of using AI tools for IP protection

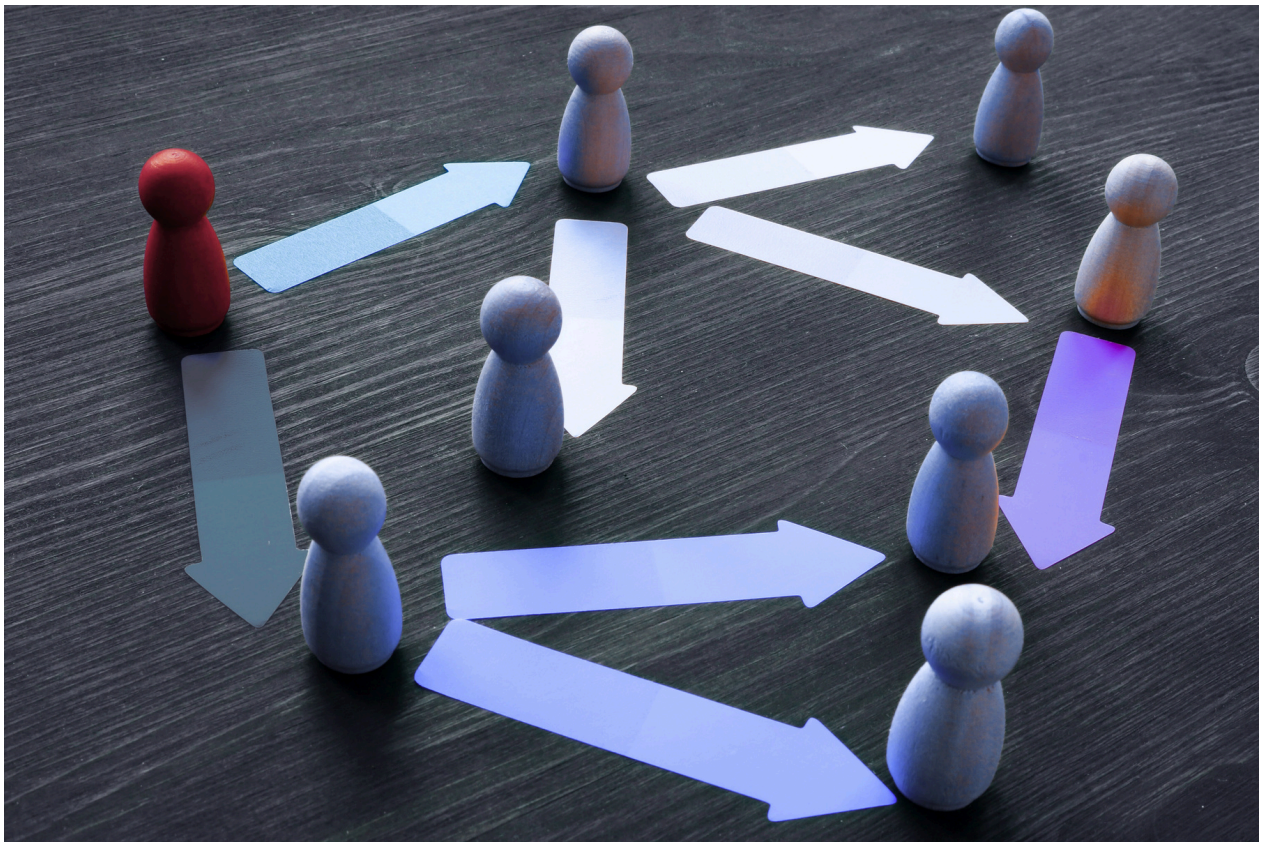
# Interview Insights

## Industry-Specific Readiness

Interviews with professionals from various industries showed that different divisions within organizations have varying levels of readiness and acceptance of AI. IT and supply chain divisions of organizations are generally more proactive and advanced in using AI, while cybersecurity and legal divisions are more concerned about the use of AI in their fields. Multiple participants noted that some organizations are more proactive in adopting AI for brand protection, while others are still in the early stages.

## Outsourcing Security

Many brand protection divisions and professionals outsource their security tools to specialized providers, indicating a reliance on external expertise for AI-related IP protection. Participants mentioned working with third-party vendors to leverage AI for detecting counterfeit products.



# 04 AI LITERACY & USE INTENTIONS

## 4.1. AI Literacy Levels

It is important to note that the AI literacy level among the sample of participants was moderate; the average response was 4.15 on a seven-point scale. This highlights the need for education and training to enhance AI literacy among the IP and brand protection community.

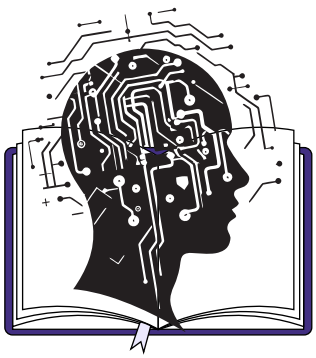



**FIGURE 4.1**
Mean composite score for AI literacy among the sample.
Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")

## Interview Insights

### Knowledge Gaps

There is a need for increased AI literacy among brand protection professionals to better understand and utilize AI tools for IP protection. As AI continues to gain popularity, impressions from the interviews indicate a trending growth in awareness among brand protection professionals about the importance of AI literacy. Professionals are seeking to understand how AI can be used both to protect their brands, and to anticipate and counteract the ways in which counterfeiters might use AI. Participants also emphasized the importance of educating other professionals and the public about the risks and benefits of AI in IP protection.

### Education and Training

Participants highlighted the role of education and training in improving AI literacy. This includes providing training sessions for law enforcement and customs officials to help them identify counterfeit products and understand the use of AI in brand protection.

## 4.2. AI Acceptance Indicators

We leveraged measures of technology acceptance (Venkatesh, 2021) to explore how AI literacy predicts socio-psychological predictors of the use of AI in IP and brand protection. Future use intentions were moderate (mean of 4.25 on a seven-point scale). However, participants indicated highly favorable attitudes toward the use of AI for IP and brand protection. Participants also expressed high levels of perceived performance expectancy as it relates to favorable perceptions of the benefits and functionality of AI in completing job-related tasks for IP and brand protection. They also reported moderately high levels of effort expectancy, or the perception that AI would be easy to use AI. This perceived ease of use is further supported by lower levels of anxiety in using AI for IP protection. However, one alarming number deals with low levels of self-efficacy (confidence in one's ability) in using AI for IP protection which highlights a need for growth and field-level strategies to strengthen such confidence.

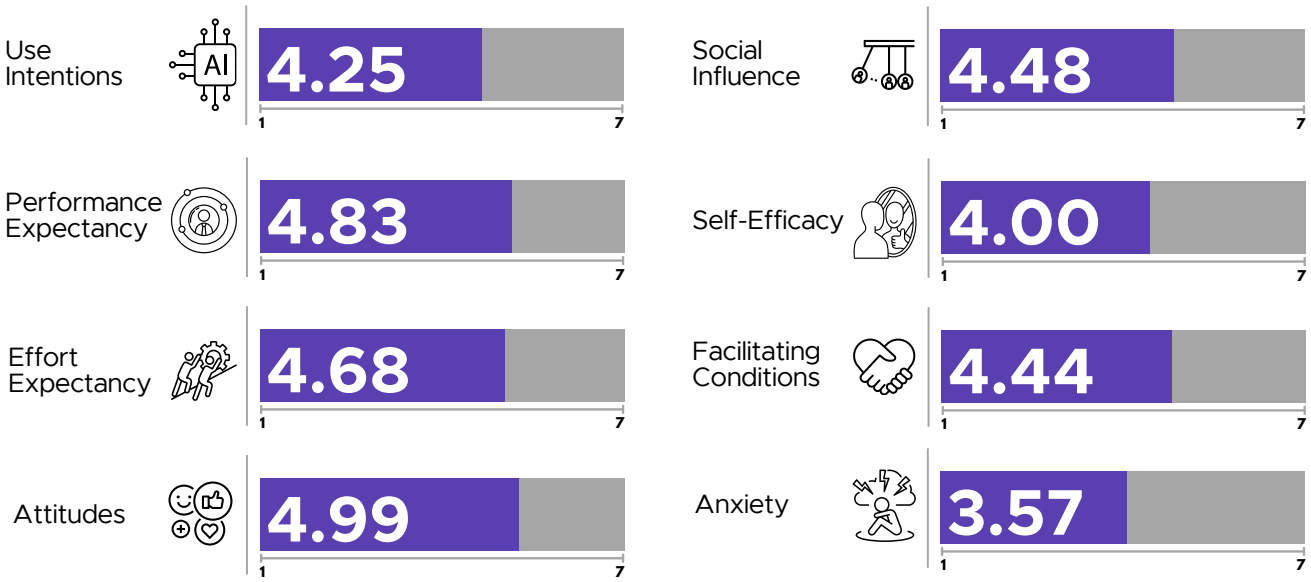



**FIGURE 4.2** Mean composite scores for AI for IP acceptance indicators.
Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")

## 4.3. AI Literacy, Acceptance, & Use

Our research found that AI literacy a key factor in predicting patterns of AI use. The higher a participant's AI literacy, the more benefits they perceive in using it for IP protection (performance expectancy), the easier they believe it is to use (effort expectancy), the more favorable their attitudes toward AI adoption, the stronger their perception that others in their organization are using AI for IP protection (social influence), the greater their confidence in their own ability to use it (self-efficacy), the easier it is for them to seek support when needed for problem solving, and the lower their anxiety toward using the technology.

When looking at how the socio-psychological factors impact intentions to use AI for IP and brand protection, four factors were most prominently influential. The more favorable a participant's attitudes about using AI for IP/brand protection, the higher their perception that using AI is normative within their social/organizational surrounding (social influence), the higher their confidence in their ability to use the technology (self-efficacy), and the lower their ability to get help when needing to solve an issue (facilitating conditions), which in turn enhances their desire to use AI in the future.

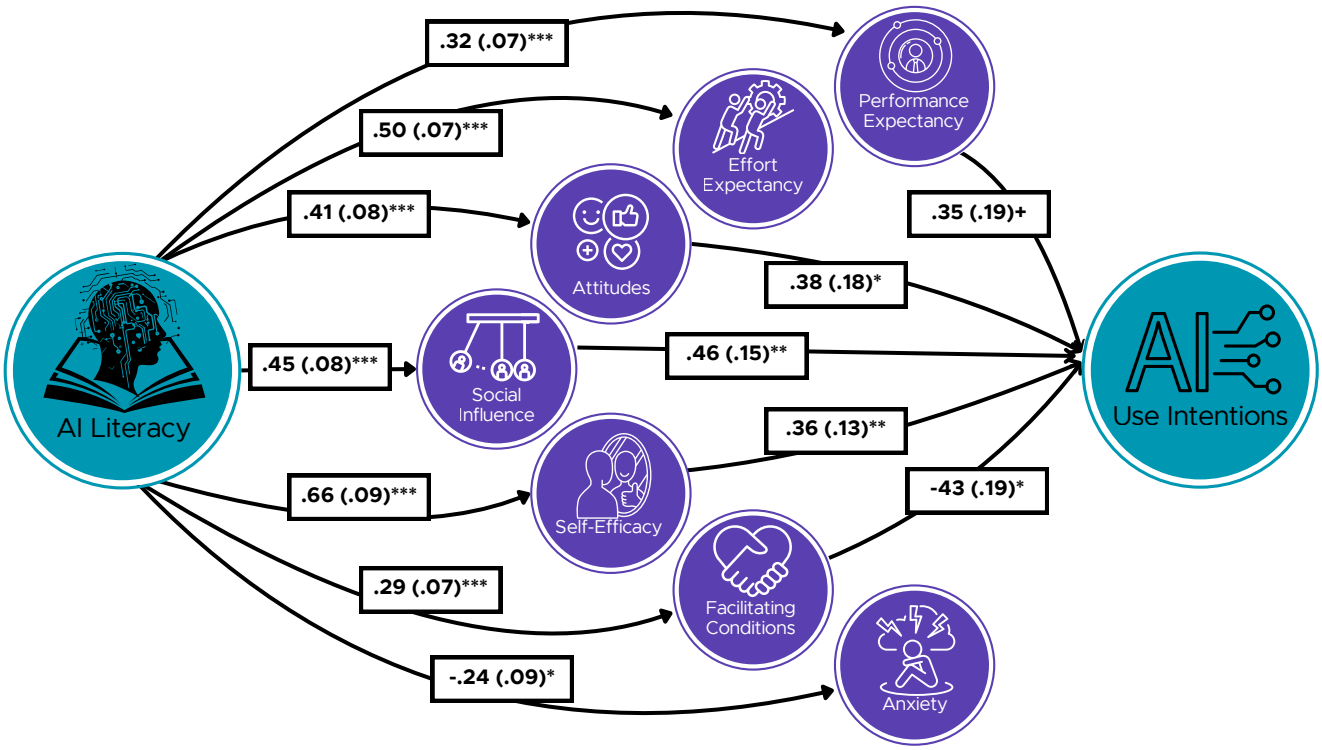



**FIGURE 4.3** Mean composite scores for AI for IP acceptance indicators.
Items rated on a seven-point Likert-type scale ("Strongly Disagree" to "Strongly Agree")

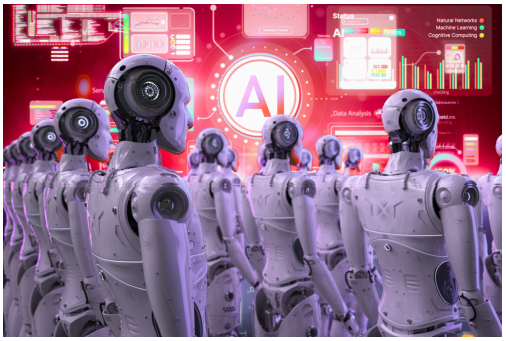
# Summary

# Summary

This exploratory study highlights emerging trends in intellectual property and brand protection, particularly regarding the perceived threats and opportunities that the evolution of artificial intelligence presents to the field. The research relied on a cross-sectional survey and in-depth interviews with working IP and brand protection professionals to derive a baseline of the perceptions, attitudes, and current practices to inform the development of a national strategy to ensure legal and ethical uses of AI within the field of IP and brand protection. Following is a summary of the major findings from this research along with a set of actionable insights.

## Risk/Benefit Duality

Participants indicated a duality of perceived risks and benefit of AI to IP and brand protection. Though risks and benefit perceptions were relatively equal, working professionals saw greater benefits than risks in how AI can aid the work of IP and brand protection. Taken at face value, this provides an opportunity for leveraging AI technology for IP and brand protection, while also ensuring that its use within the field recognizes the potential risks AI poses to the field. It is important to highlight that participants predicted both the risks and benefits to grow exponentially in coming years, thus there is a **critical need for capacity building and acceptance of the use of AI in IP and brand protection**. However, a deeper analysis identified that participants could not foresee the impact of AI on IP and brand protection specific domains (e.g., trademark, copyright, trade secrets) in terms of threat and benefits as clearly. At the same time, when looking at AI capabilities and applications to IP and brand protection, participants identified greater potential and benefits than risks in the majority of cases. This presents an opportunity for leveraging AI to streamline IP and brand protection work. Gaining a deeper understanding of the risks of AI use—particularly by bad actors—remains an area where greater transparency is needed within this multi-stakeholder community. Thus, there is a **need for systematic research to identify cases and emerging issues for both how IP and brand protection entities are leveraging AI in their work, as well as the impact of bad actors' use** of AI for IP theft and infringement.




# Summary

## Significant Knowledge Gap

When asked about the perceived threats and defeat potential of various malicious activities by bad actors, participants were unfamiliar with a substantial portion of how AI is used by bad actors and the ability to defeat such malicious activities. Participants in the interviews identified major and emerging malicious activities by bad actors leveraging AI for IP theft and infringement. This highlights a **knowledge gap among the IP and brand protection professionals in our study, underscoring the need for tailored capacity-building and education on current and emerging AI uses by bad actors**, in order to counter such malicious activities and reduce the social, economic, and political risks of IP theft.

## Lack of Organizational Readiness

Participants in our study indicated **low levels of organizational readiness to apply AI for IP and brand protection, as well as low levels of readiness to confront the emerging risks** of AI use by bad actors for IP theft. As the field of AI is evolving, it is important to provide a set of guidelines to help IP and brand protection entities assess and evaluate AI technologies for IP and brand protection.

## Critical Role of AI Literacy

Participants indicated moderate levels of AI literacy. However, higher AI literacy was associated with greater acceptance, confidence, and readiness to use AI for IP and brand protection in the future. It is important to note though that our measure of AI literacy was rather generic and did not really focus on the field of IP and brand protection. Thus, it is critical to develop AI literacy interventions and measures that are tailored to the field of IP and brand protection.

# Research Methods

# Research Methods

The current study triangulated the use of cross-sectional surveys and in-depth interviews with IP and brand protection professionals.

## Survey Participants

Participants (N = 323; 126 completed) were recruited through the A-CAPP Center's listserv of about 5,000 individuals and entities in the IP and brand protection field (response rate = 8.5%). Most participants were U.S.-based (62%) representing 24 states, and the remaining two-fifths were spread across 30 other countries. Participants were 50 years old, on average (SD = 12.45; Range = 27 to 73), mostly male (64%), White (64%), had a post-graduate degree (91%), with a median income of $150,000 per annum. Over a quarter of participants identified as IP rights holder or brand owner (30%), 16% represented law firms, 14% law enforcement, 12% from the technology/service provider sector, and 10% from academia (the rest of the sample included individuals working in investigations, consulting, government, and other types of organizations). In terms of enterprise size, 51% represented large-size enterprises, followed by small-size (35%) and medium-size (7%) companies. The sample entailed a diverse set of skills and roles. A fifth of the sample identified as brand managers (21%), followed by senior leaders (15%), law enforcement agents (11%), c-suite positions (8%), lawyers (8%), investigating (6%), among other positions). Finally, majority of participants (57%) indicated they work in an IP/brand protection team of 2-10 employees, followed 41 or more (20%), 11-20 (9%), just themselves (6%), 21-30 (5%), and 31-40 (3%).

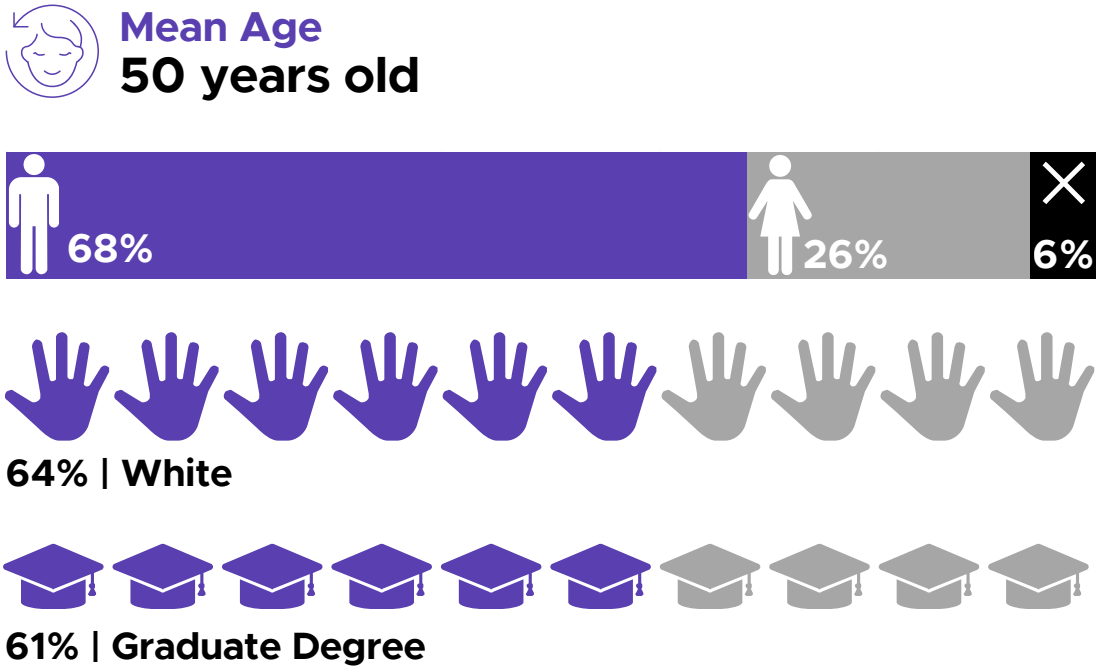



**FIGURE 5.1** Participant Demographics


**FIGURE 5.2** Participants' distribution, by enterprise size

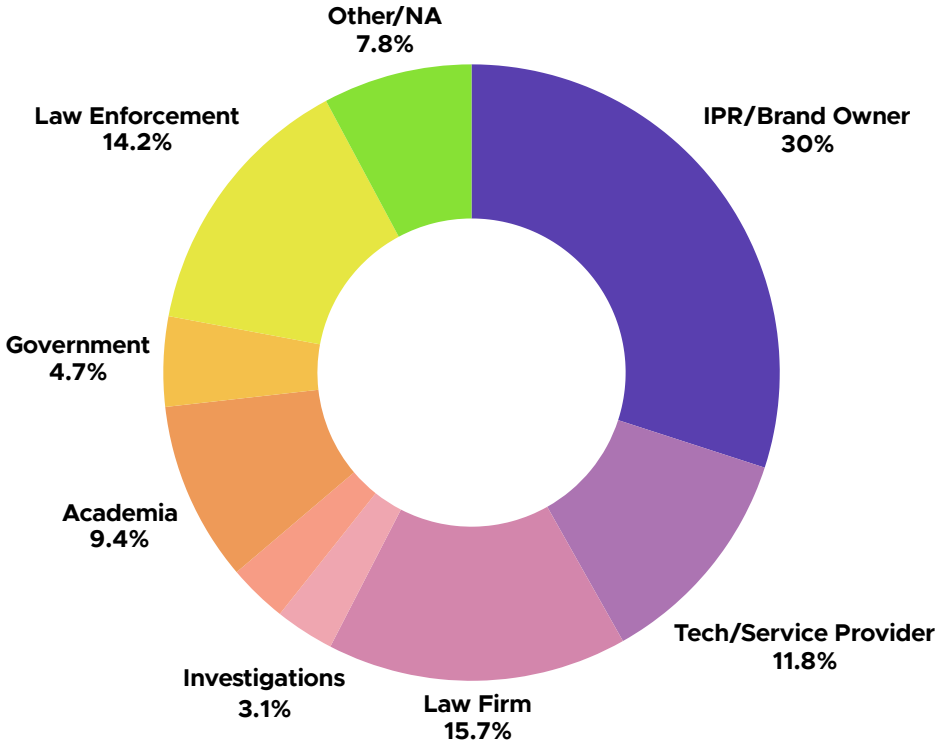
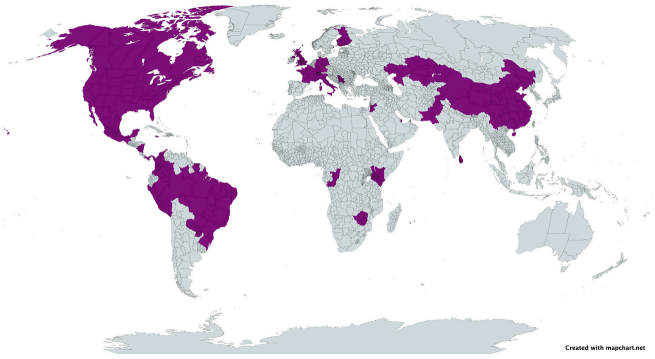
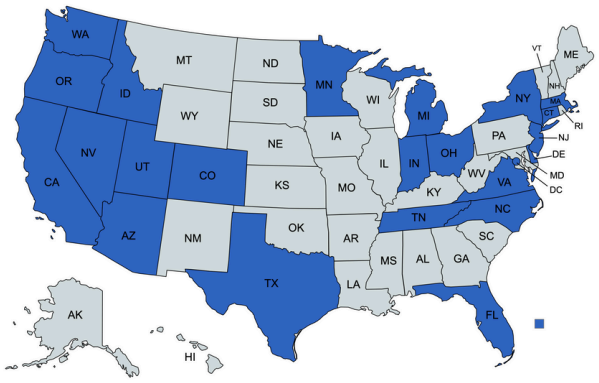



**FIGURE 5.3** Participants' distribution by type of job in the IP field




**31 Countries**

**FIGURE 5.4**
Map of global geographic distribution of participants




**61% | 24 States**

**FIGURE 5.5**
United States Participants' Distribution, by State

## Survey Measures

The survey included six sections, including the informed consent procedure; each briefly described below. Unless otherwise noted, all items were measured using seven-point scales. Scale items are included in Appendix 1.

**AI Definitions & Experiences**

In this section, participants provided their own definitions of artificial intelligence (AI), and open-ended responses were provided for perceived threats and benefits of AI to IP. They were then provided with researcher-reviewed definitions of both AI and IP. Participants then assessed general AI risks and benefits to IP (Likert-scale), and indicated the current and future perceived threats (low-high threat) and benefits (low-high benefit) of AI in relation to IP-specific domains of trademark, copyright, patent, trade secrets, security attacks to IP, and market assessment. Finally, participants responded to a nine-item AI literacy scale, where items were averaged into a composite score (Wang, Rau, & Yuan, 2023).

**Assessment of AI Threats and Benefits to IP**

This section included two categories of measures. First, we asked participants to indicate their perceived threats (low vs. high threat) and benefits (low vs. high benefits) that AI poses to specific IP protection functions of detection, recording, identification, forecasting, predicting, probability calculation, automation, and defining of IP infringement. The second set of measures were focused on specific malicious attacks facilitated by AI by bad actors (Mirsky et al., 2023). We followed Mirsky et al.'s (2023) method of asking participants to rate both the perceived harm (low vs. high harm) and perceived potential to defeat the malicious activities (low vs. high potential to defeat); all items included a "Not Familiar" answer category. A total of 33 items were measured for each harm and defeat potential constructs.

**AI Threat Perceptions**

This section included an assessment of specific consequences of AI threats to IP (e.g., financial losses, increase in crime, etc.) and an assessment of the threat to specific professional IP protection tasks (e.g., protecting one's IP, making cases for IP infringement, etc.). All measures here were developed by the research team.

**Organizational Readiness**

This section included measures to assess organizational capacity in dealing with and addressing different AI threats to IP protection. We also assess perceived barriers for developing and implementing mitigation strategies and practices to deal with AI threats to IP (e.g., knowledge of AI threats by actors in organization, AI threat velocity, volume, and variety, etc.). The section also asked about the use of AI to mitigate IP infringement and protect IP, including important

considerations for adopting AI technology for IP protection (e.g., accuracy, effectiveness, ease of use, etc.). Additionally, and relevant to this paper, we assed the acceptance of AI use for IP using UTAUT measures (Venkatesh, 2021).

**Measures of Technology Acceptance**

We leveraged Venkatesh's (2021) measures. Performance expectancy assessed participants' perceptions of the benefits of using AI for IP protection. Effort expectancy assessed participants perceived ease of using AI for IP protection. Participants also reported their attitudes toward use of AI for IP protection. Social influence dealt with participants' perceptions of the prevalence and acceptance of using AI for IP protection among their professional networks. Self-efficacy refers to perceived level of confidence in using AI for IP protection. Facilitating conditions refer to participants' perceptions of their ability to identify mechanisms and resources to help troubleshoot issues that emerge when using AI for IP protection. Anxiety deals with participants' feelings of anxiety and discomfort when using AI for IP protection. Finally, we also assess participants' intentions to use AI for IP protection.

## Survey Procedure

The study was determined to be exempt by the Michigan State University Institutional Review Board. Data were collected between March 22 and April 12, 2024. A pre-notification email was first sent to the listserv, followed by four reminders. Each email correspondence included a formal invitation signed A-CAPP and IPR Center administrators, the IRB exempt determination, and the informed consent form. The consent form was presented to participants first upon clicking on the survey link. Upon agreeing to participate in the study, participants answered general definition and experiences questions, assessment of AI threats and benefits to IP, AI threat perceptions, organizational readiness, and demographic questions. As an incentive, participants were offered a free course from the A-CAPP Brand Protection Certificate Program (one of 17 modules of their choosing that's also transferrable to another individual).

## In-Depth Interviews

A total of 13 participants (10 males, 3 females) were recruited for online video-based in-depth interviews. Interview length averaged 53 minutes (Range = 31 to 65). Participants worked at a variety of organizations, including brand and IP owners, law firms, industry associations, state prosecutors, and technology providers.

| Participant | Position | Gender | Interview Length |
|---|---|---|---|
| Participant 1 | Brand / IP Owner | M | 63 |
| Participant 2 | Law Firm | M | 65 |
| Participant 3 | NA | M | 58 |
| Participant 4 | Brand / IP Owner | M | 36 |
| Participant 5 | Brand / IP Owner | M | 58 |
| Participant 6 | Industry Association | F | 31 |
| Participant 7 | Literary Agency | F | 56 |
| Participant 8 | State Prosecutor (Retired) | M | 50 |
| Participant 9 | Brand / IP Owner | M | 47 |
| Participant 10 | Publishing House | M | 63 |
| Participant 11 | Technology Provider | M | 48 |
| Participant 12 | Technology Provider | M | 52 |
| Participant 13 | Brand / IP Owner | F | 60 |

**TABLE 5.6** Interview Participants Attributes

## 5.5. In-Depth Interview Protocol

Participants were recruited in two ways. First, survey participants were able to indicate whether they are willing to participate in the in-depth interview part. Secondly, we used snowball sampling to recruit additional participants. The interview procedure focused on the following major sections:

1. Interviewee information (5 questions)
2. Experiences with and knowledge of AI and its threats/opportunities (7 questions)
3. AI threats to IP (2 questions)
4. AI opportunities for and benefits to IP (2 questions)
5. Organizational and field readiness (7 questions)

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# Appendix

# Appendix 1: Malicious Activities Items

**(Mirsky et al., 2023]**

**Automation**
Customized attacks on IP
Coordinated attacks on IP
Illicit information sharing about IP
Next-hop targeting (e.g., lateral movement)
Phishing campaigns (e.g., automated into collection crafting of spear phishing emails, calls, etc.)
Online point of entry detection
Customer point of entry detection

**Information Gathering**
Mining open-source intelligence tools (e.g., parsing websites, retrieving relevant info, etc.)
AI model theft
Spying (e.g., collecting and mining conversations from mics, location from cameras, etc.)

**Campaign Resilience**
Malware obfuscation
Persistent backdoors (e.g., automated reinfection, backdoor info shared among bots, etc.)
Virtualization detection (anti-forensics for malware)

**Credential Theft**
Biometric spoofing
Device cache mining
Implicit key logging (e.g., using smartphone acceleration, keystroke sounds, etc.
Intelligent password guessing
Side channel mining (e.g., memory or timing patterns)

**Social Engineering**
Impersonation (e.g., voice, text, video deepfakes and online social profiles)
Persona building (e.g., a targeted trustworthy/attractive online profile)
Perceived Harm: Social Engineering: Spear phishing
Perceived Harm: Social Engineering: Target selection (e.g., weakest link with asset)
Perceived Harm: Social Engineering: Activity tracking
Stealth

**Covering tracks**
Web domain name generation (e.g., DGAs to avoid detection and blacklisting)
Evading network or host-based intrusion detection systems
Evading insider detection systems
Evading email filter (i.e., for SPAN and phishing)
Data exfiltration (e.g., evading firewall or over an air-gap for an isolated network)
Propagation (lateral movement over a network)
Scanning (e.g., local host, network assets, ports, vulnerabilities, etc.)

**Exploit Development**
Reverse engineering (i.e., to assist in manually finding a vulnerability or steal IP)
Vulnerability detection (e.g., intelligent fuzzing, static analysis, etc.)

# Appendix 2: AI Adoption Measures

**(Venkatesh, 2021)**

**Performance Expectancy**
I would find AI technology useful in my job
Using AI technology would enable me to accomplish tasks more quickly
Using AI technology would increase my productivity
If I use AI technology, it will increase my chances of getting a promotion/raise
My interaction with AI technology would be clear and understandable

**Effort Expectancy**
It would be easy for me to become skillful at using AI technology
I would find AI technology easy to use
Learning to operate AI technology is easy for me

**Attitudes**
Using AI technology is a good idea
AI technology makes work more interesting
Working with AI technology would be fun
I think I would like working with AI technology

**Social Influence**
People who are important to me think that I should use AI technology
People who are important to me think that I should use AI technology
The senior management in my organization would be helpful in the use of AI technology
In general, the organization would support my use of AI technology
Other colleagues in the IP protection community would support my use of AI technology

**Self-Efficacy**
I have the resources necessary to use AI technology
I have the knowledge necessary to use AI technology
AI technology would be compatible with other systems I use
I am confident that a specific person (or group) would be available for assistance with AI technology difficulties
I could complete a job/task using AI technology if there was no one around to tell me what to do as I go

**Facilitating Conditions**
I could complete a job/task if I could call someone for help if I got stuck
I could complete a job/task using AI technology if I had a lot of time to complete the job/task for which AI technology was provided
I could complete a job/task using AI technology if I had just the built-in help facility for assistance

# Appendix

**Anxiety**
I feel apprehensive about using AI technology
It scares me that I could lose a lot of information using AI technology by hitting the wrong key
I hesitate to use AI technology for fear of making mistakes I cannot correct
AI technology is somewhat intimidating to me

**Use Intentions**
I intend to use AI technology in the next months
I predict I would use AI technology in the next months
I plan to use AI technology in the next months

# About Us

# About the A-CAPP Center

Center for Anti-Counterfeiting and Product Protection
MICHIGAN STATE UNIVERSITY

## OUR **MISSION**

Identify and examine the complex issue of trademark counterfeiting from a practical, actionable, academic nexus/ viewpoint, working collaboratively with brand protection practitioners and communities worldwide.

## OUR **VISION**

Combat trademark counterfeiting through our research, education and outreach.

## OUR **TEAM**

We are a small and committed team passionate about brand protection and anti-counterfeiting. We rely on partnerships with others in the brand protection community for funding and engagement as well as data for our research. *Brand protection is an umbrella term that describes how brand owners (companies), law enforcement, academics and related technology and other vendors work together to stop trademark counterfeiting and protect the public.

## OUR **VALUES**

As a public, research-intensive, land-grant university funded in part by the State of Michigan, our university mission is to advance knowledge and transform lives. At the Center for Anti-Counterfeiting and Product Protection, these same values are at the core of what we do, as applied to the brand protection field. Through our vision, we live out these values by helping create solutions on a global scale to problems with significant health, safety and other risks. We also help train a diverse cadre of current and future industry professionals.

# Appendix

WE ARE **INTERDISCIPLINARY**

At MSU and at other institutions, we work with scholars in the many disciplines that make up our field, including but not limited to: Law, Criminal Justice, Business, Supply Chain, Marketing, Packaging, Engineering, Pharmacy, Advertising and Public Relations and Global Health. We also work closely with the team in International Studies and Programs, the Broad College's International Business Center/Global Business Club, the Axia Institute and others from all over campus and across the globe. We are working to develop additional relationships across a broad spectrum of potential partners.

WE ARE **COLLABORATIVE**

We work with everyone imaginable in the brand protection and anti- counterfeiting community, from academics to members of law enforcement, vendors and brand owners. We do not endorse others' solutions, allow sales of services or products, or give away our partners' information to be used for sales. This policy has helped us build relationships of trust with our partners.

WE ARE **INDEPENDENT**

Our research and related work are independent. Although we raise funding for our research and other activities as a self-sustaining unit at Michigan State University through gifts and contracts, we do not accept funding that would require us to promote a specific viewpoint or perspective.

We proactively seek to be knowledgeable about current events and updates in our field and produce research and resource tools applicable in the practice of brand protection.

WE ARE **INCLUSIVE AND PROMOTE INCLUSIVITY IN ALL WE DO**

We recognize that the field of brand protection is made better by being as inclusive as possible. We work actively to ensure that our events, programs and team are inclusive and that our educational programs view lessons and delivery through an inclusive lens. We seek to have as diverse an array of partners as possible through significant and strategic outreach.

WE **PRIORITIZE EDUCATING AND LEARNING**

We are committed to educating the current and next generation of brand protection professionals through our self-guided online courses, as well as various types of experiential education and traditional university courses. Our internship programs include mentoring and other state-of-the-art career development tools to both educate new members of the profession and create learning opportunities for their mentors.

# Appendix


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**Obtaining Additional Marketing Insights.** This report is not intended to be marketing advice for your organization. For assistance with an individualized marketing strategies incorporating findings from this study with your audience, please contact the A-CAPP Center.