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**RISK, SECURITY, IMAGINATION, AND THE MACHINE:  
LEVERAGING AI FOR CREATIVE PROBLEM-SOLVING  
IN ENTREPRENEURIAL DECISION-MAKING**

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Artificial Intelligence (AI) and generative models are emerging as powerful enablers of creative problem-solving in complex entrepreneurial environments. These technologies enhance human cognitive capabilities, manage risk, and foster strategic innovation across the stages of entrepreneurial decision-making. Drawing from recent research on AI's role in open innovation and creative intelligence, this article explores how AI systems perform essential managerial functions—mapping, coordinating, and controlling—within entrepreneurial ecosystems. It also considers how AI's imaginative capabilities can augment human creativity to generate novel, secure, and context-aware solutions in high-risk and rapidly changing environments. While the promise of AI is vast, ethical considerations, algorithmic biases, and data security risks must be addressed to fully harness its transformative potential.

### **1 Introduction**

Entrepreneurial ventures today operate in highly complex, volatile, and interconnected environments where traditional decision-making models often fall short. As complexity grows, the ability to creatively solve problems under risk and uncertainty becomes a defining entrepreneurial capability. Emerging technologies—particularly artificial intelligence (AI) and generative models—have been recognized not only for automating routine tasks but also for reshaping innovation, risk assessment, and decision-making at the strategic core of entrepreneurial practice (Balamurugan & Ramamoorthy, 2025).

Beyond enhancing efficiency, AI systems now contribute to strategic imagination, offering entrepreneurs simulated foresight, scenario generation, and creative exploration tools. Combined with their ability to process vast data and mitigate cognitive biases, these technologies are ushering in a new era of transformative intelligence in entrepreneurship. This article explores the

intersection of AI, risk management, and creative problem-solving through the lens of entrepreneurial ecosystems.

## **2. The Role of AI in Creative Decision-Making**

AI's impact in entrepreneurship has traditionally focused on automation and optimization. However, recent literature expands this view by positioning AI as a tool for cognitive augmentation—especially in tasks involving problem discovery, design thinking, and decision-making under uncertainty (Broekhuizen et al., 2023). Three major functions illustrate this:

- Mapping: AI identifies patterns, opportunities, and risks by scanning internal and external environments.

- Coordinating: AI facilitates collaboration across stakeholders, streamlining knowledge integration and strategic alignment.

- Controlling: AI ensures outcomes by managing performance, detecting anomalies, and adapting to dynamic inputs.

This model is especially valuable in open innovation contexts, where firms must interact with external partners, manage intellectual property, and forecast uncertain futures (Broekhuizen et al., 2023).

## **3. Transformative Intelligence and Imaginative AI**

Balamurugan and Ramamoorthy (2025) introduce the concept of Transformative Intelligence—the ability of AI and generative models to create novel solutions in complex, ambiguous settings. These tools:

- Simulate complex scenarios with generative reasoning.

- Enable real-time adaptation to evolving environments.

- Offer ideation support by generating alternative perspectives.

This imaginative capacity is vital in entrepreneurship, where problem framing is often as important as problem-solving. For example, generative AI can propose unconventional business models, product designs, or customer engagement strategies—freeing entrepreneurs from path dependency and cognitive lock-in.

## **4. Managing Risk and Security with AI**

AI systems also redefine how entrepreneurs perceive and manage risk. By modeling multi-dimensional risk environments and simulating potential outcomes, AI helps:

- Anticipate market, operational, or partnership disruptions.

- Manage cybersecurity and data privacy risks via blockchain-AI integrations (Broekhuizen et al., 2023).

- Reduce bias and improve equity in decision-making processes.

Nevertheless, AI itself introduces new forms of risk: algorithmic opacity, surveillance concerns, and dependence on black-box models. Ethical design, transparent algorithms, and regulatory compliance are critical for mitigating these emerging vulnerabilities.

### **5. Applications in Entrepreneurial Ecosystems**

The integration of AI into entrepreneurial ecosystems manifests across multiple domains:

- Innovation Strategy: AI proposes novel product-market fits and predicts emerging trends.
- Collaboration Platforms: AI enhances open innovation networks by aligning partner goals and capabilities.
- Resource Allocation: Generative models suggest efficient deployment of financial and human capital.
- Creative Product Development: AI augments ideation through multi-modal content generation, from design blueprints to marketing narratives.

These systems are not just tools—they are collaborators that extend the imagination and foresight of entrepreneurs.

### **6. Challenges and Ethical Considerations**

Despite the advantages, several challenges remain:

- Bias and Fairness: AI systems trained on biased data can perpetuate inequality.
- Trust and Transparency: Entrepreneurs and stakeholders must understand and trust AI's recommendations.
- Security: As reliance on AI grows, so does the importance of securing models against manipulation and breach.

Embedding ethical AI frameworks and fostering AI literacy are essential for responsible and inclusive adoption.

### **Conclusions**

As entrepreneurship moves deeper into the digital age, the capacity to make high-quality, creative decisions under uncertainty is becoming not just an advantage—but a necessity. Artificial Intelligence (AI) and generative models are emerging as indispensable tools in this transformation. They enable entrepreneurs to not only manage data and streamline operations, but also reimagine problems, expand creative boundaries, and proactively navigate complex risk environments.

This article explored how AI's roles in mapping, coordinating, and controlling support not only operational efficiency but strategic innovation. When applied within open innovation ecosystems, AI strengthens partner alignment, improves foresight, and uncovers non-obvious opportunities that might be overlooked using human cognition alone (Broekhuizen et al., 2023). Simultaneously, AI's integration with generative models introduces a paradigm shift—from decision support to imaginative collaboration—where machines do not merely assist but participate in ideation and solution development (Balamurugan & Ramamoorthy, 2025).

At the heart of this evolution is the idea of Transformative Intelligence—a synergy between human creativity and machine logic that allows entrepreneurs to

transcend traditional boundaries of thought. By leveraging these tools, startups and innovators can more confidently approach high-risk, high-reward scenarios, simulate future outcomes, and adapt strategies in real-time.

Yet, this transformation is not without risk. As AI gains more influence in strategic domains, it becomes critical to address the ethical, social, and security implications of its use. Issues such as algorithmic bias, explainability, and over-dependence on opaque systems can erode trust and widen inequities within entrepreneurial ecosystems. Therefore, human oversight, inclusive design, and ethical governance must evolve alongside technical capabilities.

In conclusion, the true power of AI in entrepreneurship lies not merely in computation, but in augmented creativity and collective intelligence. Entrepreneurs who embrace AI not as a replacement for human insight but as a co-creator of value will be best positioned to thrive in uncertainty, lead with imagination, and build the resilient, inclusive ventures of the future.

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