Ethical, Legal, Social Implications (ELSI) of Consumer Robotics

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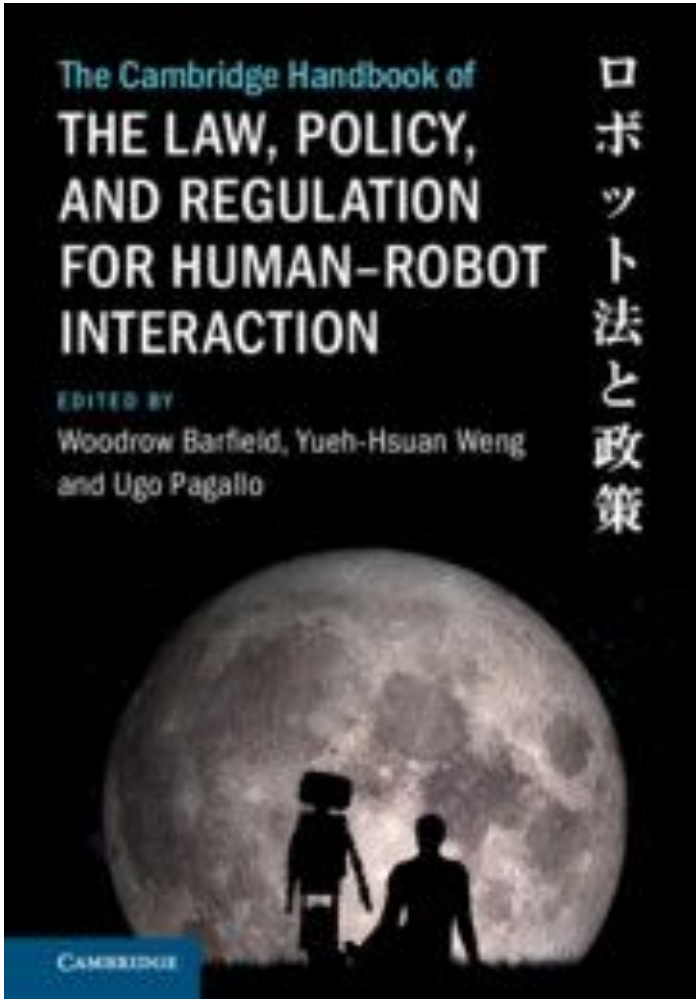


Ch. 18 Rosie Is a Rental: What Thriving Interactive Robotics Could Mean for Our Society

AJung Moon & Jimin Rhim

The Vision

The Jetsons' ABC (1962)
Rosie, the maid robot in 2062

Gary the robot (2022) straightening up toys.
Unlimited Robotics

- A capable helper
- A trusted companion
- A permanent family member

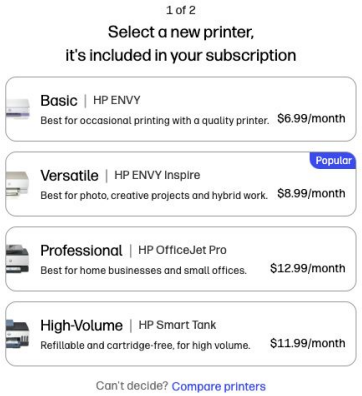
One day, each household would have a robotic helper

The Promise

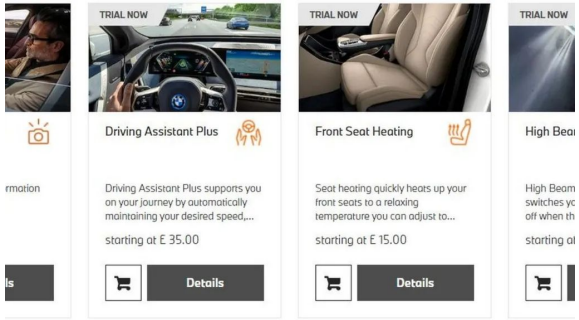
Companies are marketing robots as… Family companions, Healthcare assistants, Aging-in-place enablers, Home helpers

The promise seems within reach. We have: Advanced AI, Sophisticated hardware, Cloud connectivity, Growing market interests

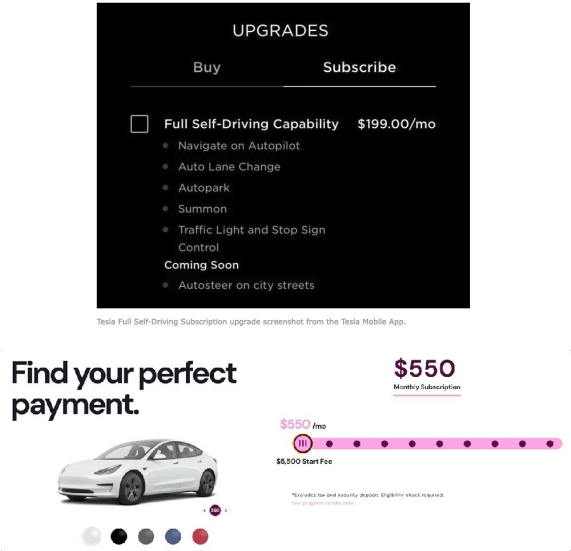
Ownership Dynamics in Today's Tech Market, the Fine Print



HP Printer Ink Subscription
Remotely 'locked'



BMW: $18/month for heated seats you already have

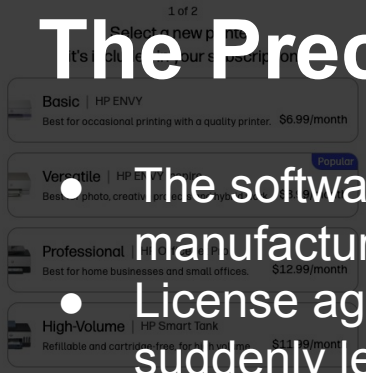


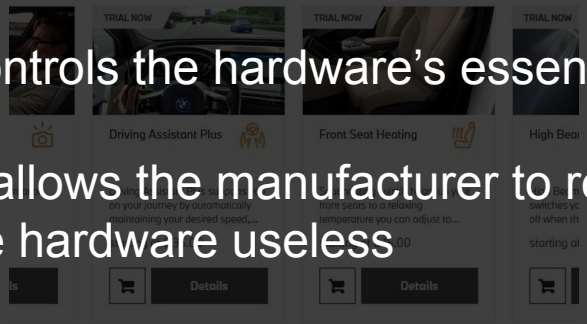
Tesla's increasing software prices

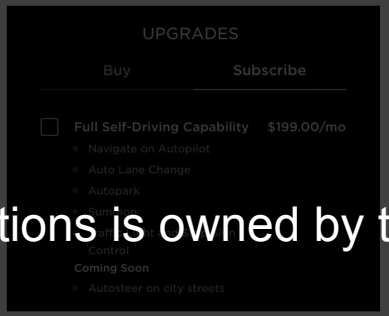
Ownership Dynamics in Today's Tech Market, the Fine Print

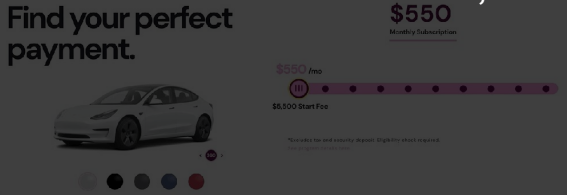
The Precarious Ownership

- The software that controls the hardware's essential functions is owned by the manufacturer
- License agreement allows the manufacturer to revoke access the software, suddenly leaving the hardware useless









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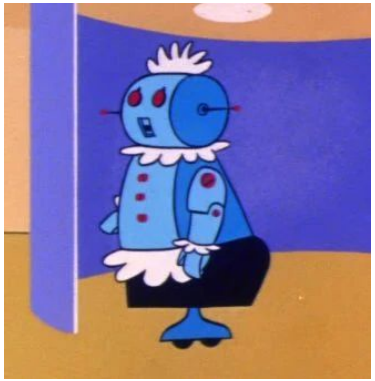
The Hidden Warning

Rosie was a rental… She was never owned…

Agnes.
Speaks British accent.
Basic economy model

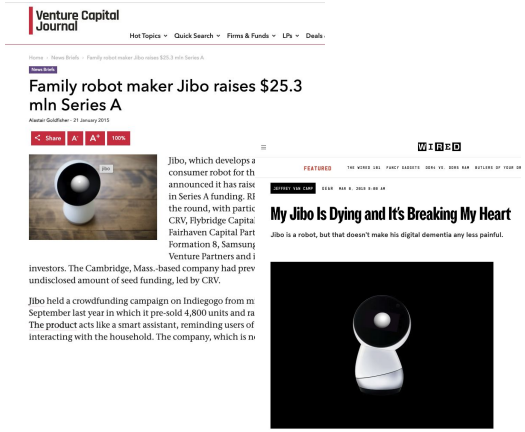
Blanche, Speaks French.
Higher model



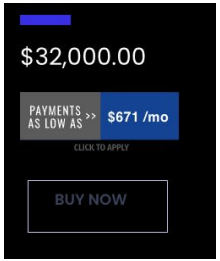
Rosey, older model XB-500
The only one the Jetson's could affort

https://aminoapps.com/c/geekdom/page/blog/rosie-the-riveting-robot/06ng_w2Ikumo01d4x2ZeqEQrWY8BjqDD4
https://thejetsons.fandom.com/wiki/U-Rent_A_Maid#:~:text=5%20Gallery-,About%20U%2DRent%20A%20Maid,Blanche%20Cog%2C%20she%20picked%20Rosey.

The reality check for Consumer Robots



Jibo: $899 social robot, defunct after 2 years

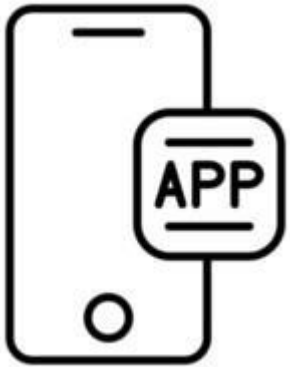


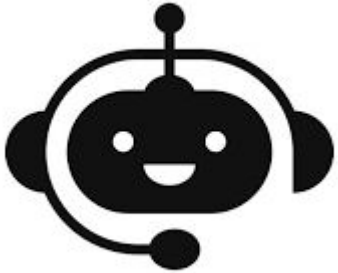
Pepper: + monthly subscriptions

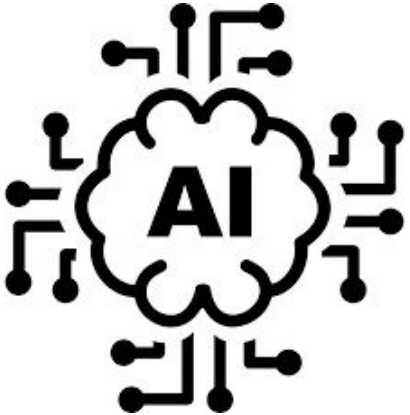
Aibo: $2,899+ ‘AI Cloud Plan’ $300/ Year

Similar risks for home robots, these aren't products you own

The current market treats robots as “Just Software with a Body”







What makes an interactive robot inherently distinct from software-based system?

More than a Machine

“54% of children felt it was morally wrong to put the humanoid robot Robovie in a closet after interacting with it for just 15 minutes”

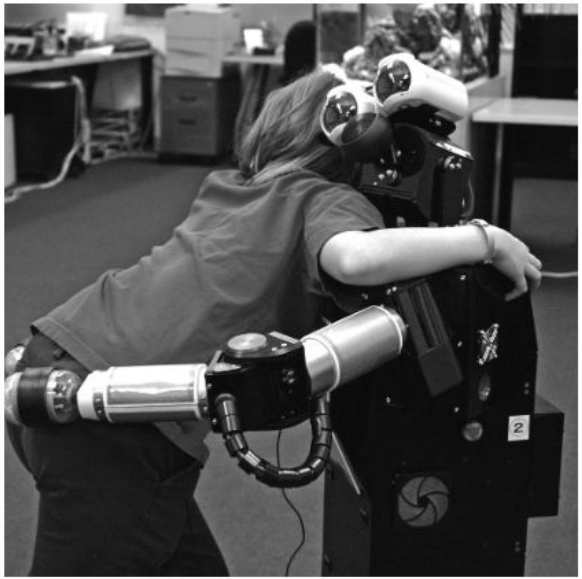
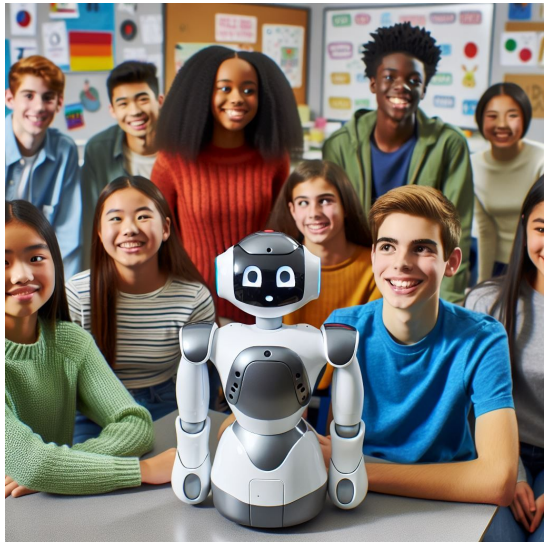


Figure 2. Physical intimacy with Robovie.

Kahn Jr, Peter H., et al. "“Robovie, you'll have to go into the closet now”: Children's social and moral relationships with a humanoid robot." *Developmental psychology* 48.2 (2012): 303.

Physical Presence of Robots

- Corporeal impact
- Social facilitation effects
- Physical manipulation capabilities
- Environmental presence



Hoffmann, Laura, Nikolai Bock, and Astrid M. Rosenthal vd Pütten. "The peculiarities of robot embodiment (emcorp-scale) development, validation and initial test of the embodiment and corporeality of artificial agents scale." *Proceedings of the 2018 ACM/IEEE international conference on human-robot interaction*. 2018.

From Rental to “Relationships”

What makes the precarious ownership a bigger problems for robotics in terms of ELSI (Ethical, legal, social Implications)?

Articulation of Critical ELSI Issues

- Personalization as a Double-Edged Sword
- The Cost of Quality: Financial Inequities in Human-Robot Interaction
- Environmental Impact of Expensive Robot Components

*7 critical issues are highlighted in the book chapter

Personalization as a Double-Edged Sword

Personalization involves tailoring a robot's behavior and interactions to individual users based on their habits and preferences.

Benefits:

- Enhanced User Experience: Robots can adapt to users' specific needs, improving interaction quality.

Challenges:

- Dependency on Data: Personalization relies on extensive data collection, raising privacy concerns.
- Exploitation Risks: Personalized interactions can be manipulated to influence user behavior, such as encouraging specific purchases.
- Transferability Issues: Customized features may not transfer easily to new robotic platforms, leading to loss of invested time and effort.

Emotional and Social Impacts of Subscription-Based Robotics

Social interactions with robots become transactional due to subscription-based access, making relationships dependent on continuous payments rather than being stable.

- Psychological Ownership: Users often develop a deep sense of ownership over robots, treating them as family members or friends.
- Emotional Impact: The loss of a robot due to financial constraints can lead to significant feelings of loss and disappointment, similar to losing a loved one.
- Subscription Fees: Financial constraints can lead to the discontinuation of robot services, amplifying the transactional nature of interactions.

Vendor Lock-In: A Growing Concern in Consumer Robotics

Vendor lock-in occurs when consumers are dependent on a single vendor for products and services, making it difficult to switch without significant costs or inconvenience.

- Proprietary Technologies: Vendors develop hardware and software that are specific to their brand, limiting compatibility with other vendors.
- Consumer Frustration: Lack of interoperability between different vendors' platforms can lead to increased consumer frustration.
- Limited Options: The small diversity in the consumer robotics market means fewer alternatives for consumers, amplifying the impact of vendor lock-in.

The Cost of Quality: Financial Inequities in Human-Robot Interaction

Financial barriers limit access to high-quality human-robot interaction experiences

- Economic Disparity: Wealthier individuals can afford better and more consistent robotic assistance.
- Impact on Vulnerable Populations: Older adults and those with disabilities may face financial strain to maintain robotic support.
- Market Influence: Early adopters with financial means shape the design and features of future robots, potentially neglecting the needs of the general population.

Environmental Impact of Expensive Robot Components

The lack of options to reuse or repurpose robotic hardware exacerbates the environmental impact, making it crucial to prioritize sustainable practices in robotics

- High Production Costs: Manufacturing robotic devices involves substantial resources, resulting in a larger carbon footprint compared to many IoT devices.
- Disposal Challenges: Unlike software, physical robots cannot be easily "uninstalled" and require proper disposal, contributing to electronic waste.
- Limited Reusability: Without interoperability, hardware is often discarded rather than repurposed, leading to environmental unsustainability.

Are current roboethics or AI Ethics frameworks equipped to address the harms consumers are facing during HRI?

Limitations of existing Roboethics Framework

Theoretical discussions (e.g., dehumanization, authenticity of HRI), lacking consideration of realities of deployment considerations

- No protection against service discontinuation
- Limited hardware interoperability requirements
- Lack of minimum functionality standards
- Insufficient data portability rights

- The 2014 code of ethics for HRI practitioners (Riek and Howard)
- BSI's 2016 standard on ethical design of robotic systems

The dream of robots in every home requires rethinking our approach to ownership, or we risk doing more harm than good to society

Call to Action: Building a Sustainable Future for Consumer Robotics

1. **Regulatory Reform**
   - Review and revise existing AI/IoT regulations for robotics contexts
   - Create consumer protection frameworks addressing robot-specific issue
2. **Industry Standards**
   - Establish guidelines for ethical subscription models
   - Define requirements for long-term software support
3. **Research Priorities**
   - Study sustainable business models balancing corporate and consumer interests
   - Examine psychological effects of robot discontinuation
4. **Community Collaboration**
   - Foster dialogue between industry, academia, and policymakers
   - Develop best practices for ethical robot design and deployment
5. **Environmental Responsibility**
   - Create guidelines for responsible robot lifecycle management
   - Promote sustainable manufacturing practices