

How do you maximise the potential of robots?

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Robots are reaching the market. But something is wrong. They're not being accepted.

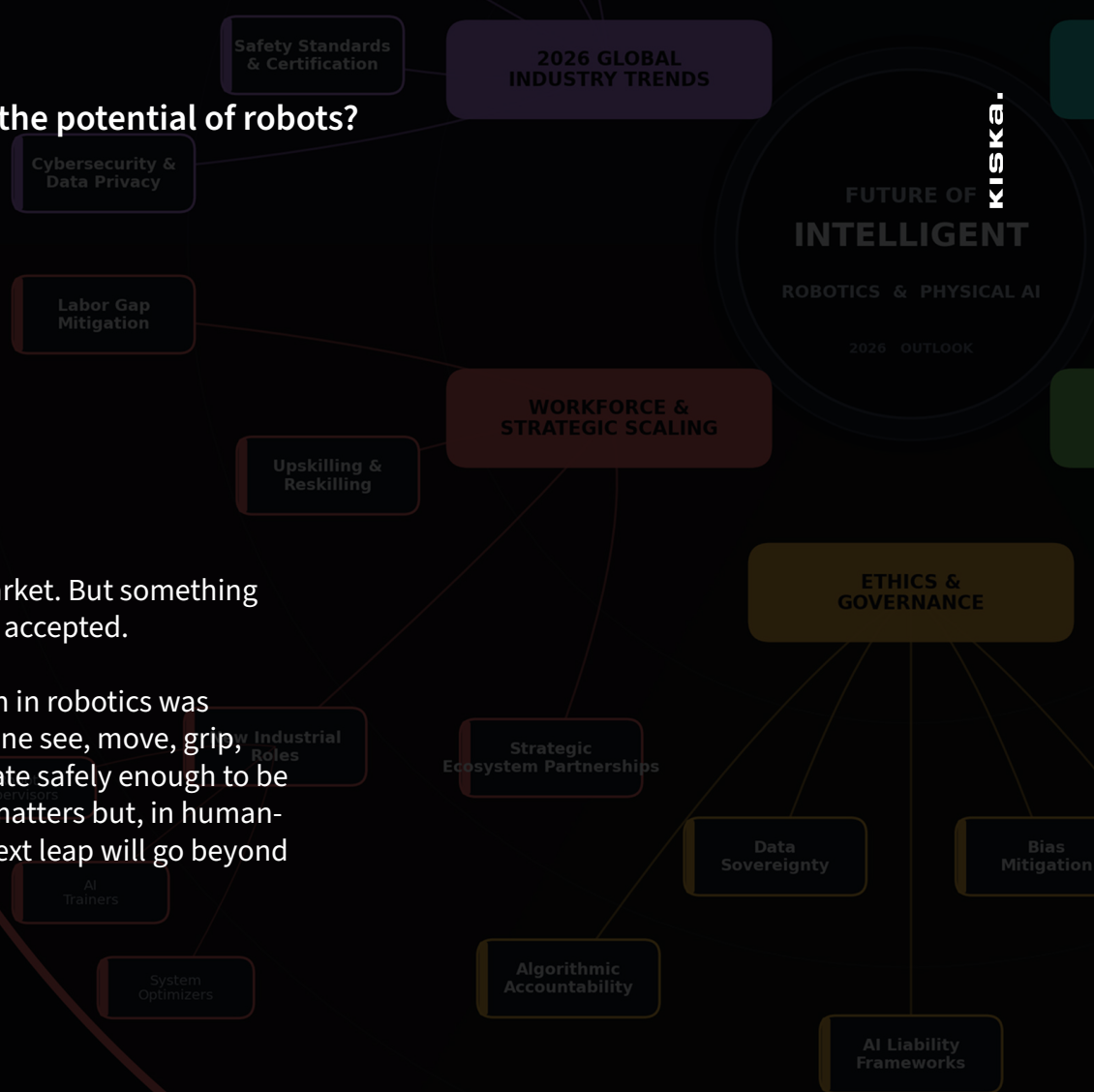
For years, the hard question in robotics was capability. Could the machine see, move, grip, navigate, decide, and operate safely enough to be useful? That question still matters but, in human-facing environments, the next leap will go beyond a technology push.

It will come from designing machines people can connect with, make allowances for, and genuinely want around them.

KISKA · Suna · Design study · 2026

A robotics whitepaper from KISKA.

The ideas in this whitepaper are based on our research, observations, and practical experience. They represent KISKA and its creative minds' perspectives on the current challenges and opportunities shaping robotics adoption.



”
*When we look at
robotics, we see
enormous potential.*

When I think about my kids, I don't want them to remember robots as “Frankensteins”: strange combinations of technology and parts and purposes. This is what will happen if we don't do better today.

Today, robotics companies have solved many of the hard technical problems. The next challenge is making those machines understandable, trusted, and desirable in real environments. That is where design and brand need to move closer to the core of development.

How a robot looks, moves, sounds, feels, and communicates is critical for its adoption. And the companies that treat design as part of the product's core logic will be the ones to create robots people understand, trust, and accept.”



Julian Herget (Managing Partner)

For a decade, the hard question in robotics was capability.

But, as robots move into hotels, hospitals, homes, retail spaces, restaurants, and other public environments, capability is no longer the only factor shaping adoption. A robot can complete its task and still fail as a product.

Across human-facing robotics, we repeatedly see four major opportunities being missed: aligning the robot with the brand behind it, designing for human acceptance, getting the first encounter right, and adapting implementation to different cultural contexts.

So, despite advances in AI and the machines physically working, they're still being wheeled into backrooms, switched off, and returned simply because people don't want them to be there. In the human-facing service sector, adoption depends on more than torque, uptime, and payload. It depends on whether the people accept it.

We recognise this as a design problem: the layer that connects technology to human acceptance and helps decide whether a capable machine becomes a product people actually use.

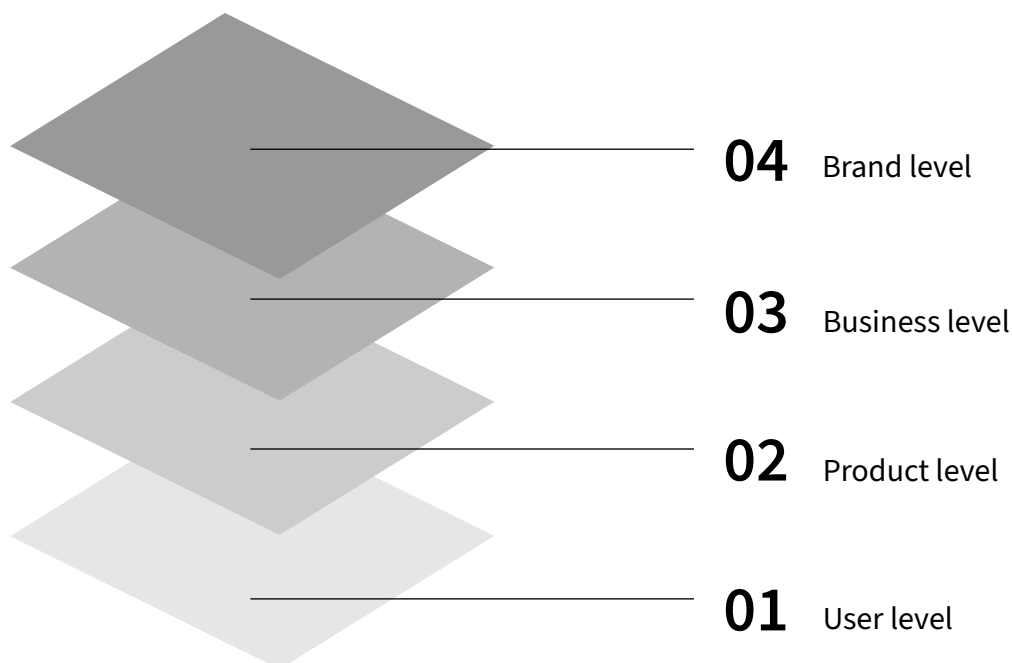
The challenge is plain to see.

A robot can complete its task and still fail as a product.

So, what is the solution?



In this whitepaper, we explore where success can be measured on four levels.



Robots are technologically ready for the market. But the market isn't ready for them because almost no-one has designed them to be wanted. Companies which solve this will have a competitive edge.

How
people
currently
experience
robots.

Chapter

01

Chapter 01: How people currently experience robots.

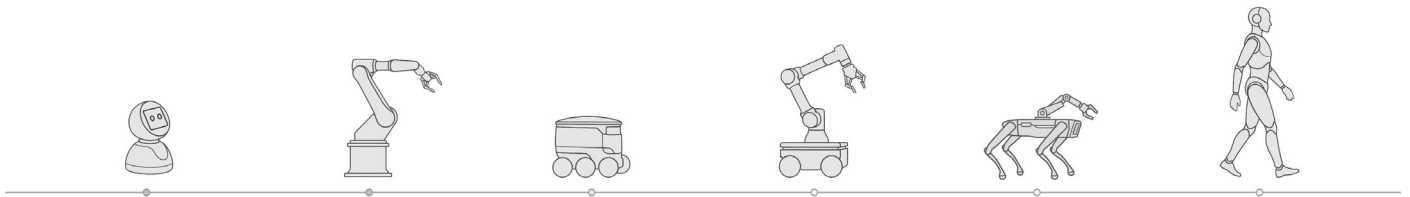
The industry at a glance...

According to Fortune Business Insights, independent analysts value the humanoid-robot market at roughly \$4.9 billion in 2025, rising toward \$6.2 billion in 2026 and projected past \$165 billion by 2034 – a compound growth rate near 50%.¹

ABI Research places the commercial inflection for the category in 2026–2027, the window in which safety, regulatory, and return-on-investment questions are expected to resolve.²

The broader service-robot wave is arriving with it: human-facing ‘biped’ service robots are forecast to make up over 70% of the humanoid market in 2026 precisely because these machines must look right and behave naturally around people.³

The evolution of robots:



Robotics has evolved from fixed, single-purpose machines toward mobile, general-purpose systems designed to operate around people.

Early robots were caged industrial arms optimised for repetition and precision in controlled factory settings. Over time, mobility, sensing, and AI allowed robots to leave the cage; first as wheeled mobile robots and mobile manipulators, then as legged quadrupeds, and now as bipedal humanoids.

This shift is being driven by breakthroughs in AI (particularly vision-language-action models and large language models), falling component costs, and acute labour shortages in ageing economies. The consequence is a move from robots that work instead of people in isolated spaces, to robots that must work alongside people in shared, human-facing environments. Which is precisely why design and acceptance now matter as much as capability.

¹ Fortune Business Insights, Humanoid Robot Market Size, Share & Growth Report [2034] (2026). <https://www.fortunebusinessinsights.com/humanoid-robots-market-110188>

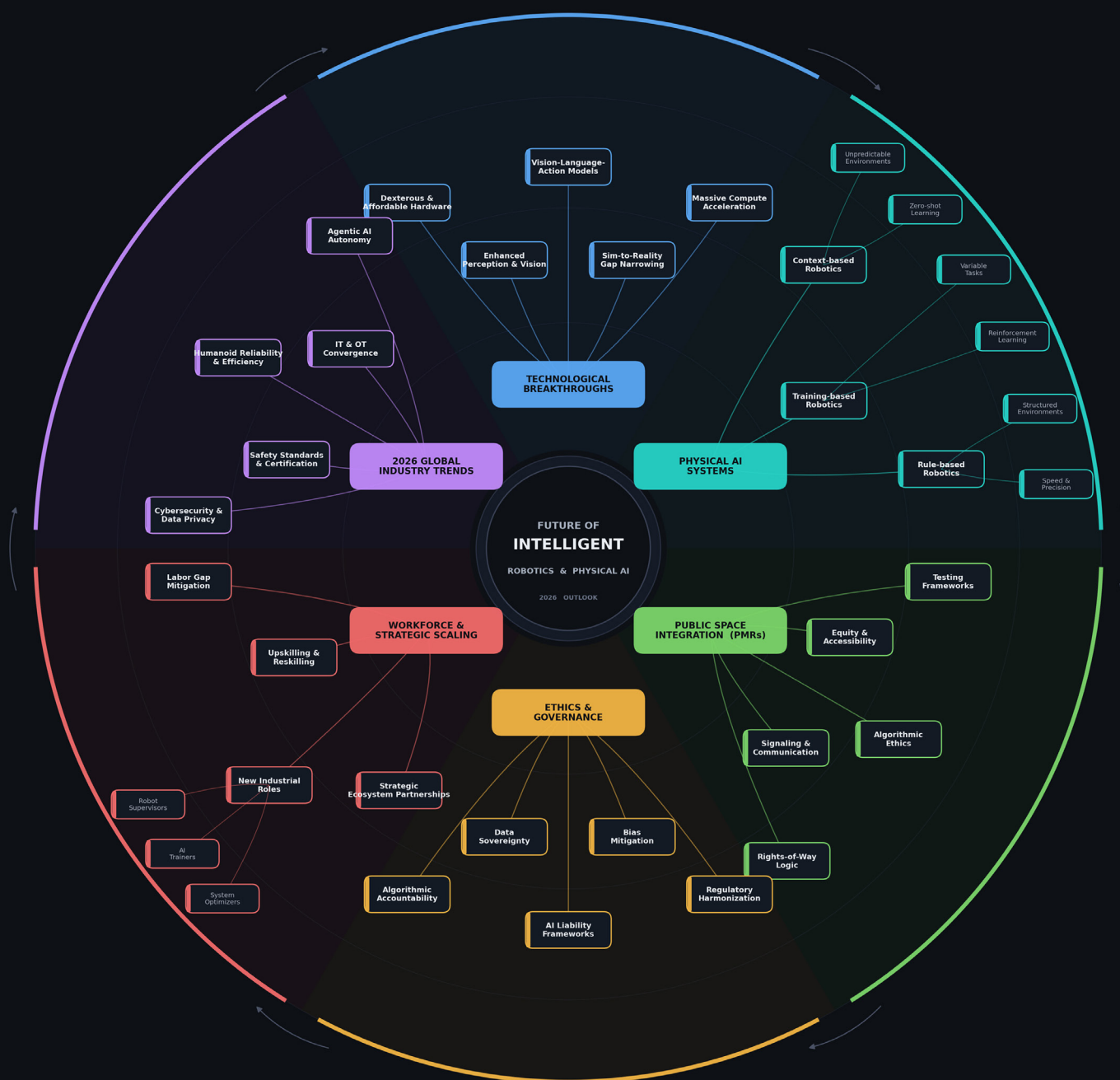
² ABI Research, Humanoid Robot Market Size Outlook, 2024–2030 (July 2025). <https://www.abiresearch.com/news-resources/chart-data/humanoid-robot-market-size-outlook>

³ Fortune Business Insights, Humanoid Robot Market Size, Share & Growth Report [2034] (2026). <https://www.fortunebusinessinsights.com/humanoid-robots-market-110188>

Which sectors are they used in?

To map where robotics is heading, we synthesised current industry reporting, analyst forecasts, and public-space deployment data, then clustered the findings into the recurring themes we saw emerging across the field. This produced five interconnected segments (technological breakthroughs, physical-AI systems, public-space integration, workforce & strategic scaling, and

ethics & governance) organised around a single centre: the future of intelligent robotics and physical AI. We chose a radial structure rather than a list because these forces are interdependent: progress in one segment (e.g. physical-AI capability) directly reshapes the others (e.g. governance and public-space integration).



What about East Asia markets?

China, South Korea and Japan are leading globally when it comes to consumer adoptions of robots in human-facing industries.

Across East Asia, the same forces (ageing populations, labour shortages, and strong industrial policy) are accelerating robotics adoption. China is transitioning from technological breakthroughs to large-scale commercialisation: its Q1 2026 robot exports reached RMB 11.32 billion, shipped to 148 countries and regions, and the world's top six humanoid brands by shipment volume are all Chinese.⁴

Japan, facing a working-age population set to shrink by nearly 15 million over two decades, is targeting 30% of the global physical-AI market by 2040, with eldercare a priority.⁵

South Korea, the world's most automated economy at 1,012 industrial robots per 10,000 workers, aims to produce 1,000 humanoids a year by 2029. Together, the region is both the largest producer and one of the fastest-growing adopters of robotics.⁶

⁴ CGTN, "China's robotics exports off to good start in Q1," 7 May 2026. Data source: General Administration of Customs of China. <https://news.cgtn.com/news/2026-05-07/China-s-robotics-exports-off-to-good-start-in-Q1-1MWP9aih9Ac/p.html>

⁵ Fortune, "Japan turns to robots and AI to counter its shrinking workforce," 6 April 2026. Data sources: Japan Ministry of Economy, Trade and Industry (METI); Reuters/Nikkei survey. <https://fortune.com/2026/04/06/japan-labor-shortage-robots-ai-robotics-humanoid/>

⁶ Goldman Sachs Research, "South Korea's growing role in humanoid robot development," 2026. Robot-density data source: International Federation of Robotics (IFR), World Robotics report. <https://www.goldmansachs.com/insights/articles/south-koreas-growing-role-in-humanoid-robot-development>



Jessie Qiao (Strategy & Research)

Home-use robots have gradually become widespread, service robots are increasingly adopted in commercial settings, and emotionally companion robots are drawing growing attention. Overall, the market maintains an open and positive attitude towards the acceptance of robotics.

”In East Asian markets, innovative and exciting ideas are more likely to be accepted which gives great scope to those companies willing to experiment.”

So, what’s the global problem?

The barrier has shifted from performance to acceptance.

Many robots are now technically advanced enough to enter real deployment contexts. But deployment does not guarantee acceptance. The central question is no longer “can robots do what we want?” but “do humans accept the robots that can do what we want?”.

The moments it goes wrong...

Chapter

02

“Uncanny Awkward Toy-like Generic”

It all comes down to human acceptance. Most robots today are engineered for performance first – range, payload, uptime, speed – and only then does design enter the conversation.

But in human-facing contexts, performance alone is not enough. What matters is the interaction in all dimensions: how the robot looks, feels, sounds, moves, and communicates, right down to the choice of materials and fabrics. When these dimensions are designed holistically, a robot stops being a technical device and starts becoming a trusted presence.

Many people approach new technologies, especially robots in human spaces, with caution; design must respond to that.

Three common failure points are...

Brand / robot mismatch.

If a brand promises calm, premium service, but its robot is noisy, jittery, plastic-heavy, and harshly lit, the experience sends a conflicting signal. Instead of feeling like an extension of the brand, the robot feels like rented hardware.

Novelty without utility.

A strong character, friendly form, and delightful movement may create attention at launch, but attention is not adoption. Once the novelty fades, people ask a harder question: what is this for? Kuri was gorgeous, designed by an ex-Pixar talent, but had a role that was difficult to justify over time ⁷.

Trust collapse.

A single bad interaction undoes months of goodwill. Robots are being integrated into very personal spaces – hospitals, restaurants, homes – and can very easily go from useful to resented. Pepper, a humanoid retail assistant, failed due to shallow conversations, limited functionality, and unreliability, compounded by weak commercial ROI. ⁸

⁷ The Robot Report, Kuri robot canceled and operations halted at Mayfield Robotics (2018). <https://www.therobotreport.com/kuri-robot-cancelled-mayfield-pauses/>

⁸ The Japan Times, SoftBank pulls the plug on its flagship Pepper 'humanoid' robot (2021). <https://www.japantimes.co.jp/news/2021/06/29/business/corporate-business/softbank-pepper-robots-ai-economy/>



Timur Burbaev (Design Lead)

The question is not only what a robot can do. It is how clearly people understand it. How it moves. How it signals intent. How it feels in the room. Whether it has a role people can accept.

The question is not only what a robot can do. It is how clearly people understand it.”

A robot that looks generic, moves awkwardly, and communicates poorly will struggle, even if the technology is strong. But when industrial design, interaction design, motion, CMF, and brand are developed together, the robot starts to feel intentional.”

The bottom line:

A human decides whether to trust a robot in the first seconds of an encounter (a glance, an approach, a pause) while the companies building those robots still measure success in torque, accuracy, and uptime.

Principles of good human-robot interaction.

Chapter

03

Creating trust isn't merely design styling at the end of the process. It should be built in from the beginning, stemming from insights into the desired end users and industry. Acceptance is decided by the design from the mechanism outwards.

Core building blocks:

Legibility:

People must instantly understand what a robot does and what it will do next.

Approachability:

Anxiety around the robot must be minimised through form, movement, language, light, sound, and tactility.

Role clarity:

People must understand the purpose of the robot instantly, from colleague, to tool, to brand ambassador.

Five practical capabilities meet these principles (and translate directly into commercial success):

01 Motion and behavioural design.

How a robot moves, hesitates, and responds is the choreography of trust.

Robots operate in physical space, often at a distance, frequently with people who never read the manual. How a robot signals “I see you,” “I’m about to move,” or “I’m waiting for you” must be legible without a single word on a screen, e.g. through a subtle reorientation, anticipatory motion, a resting posture. This is where robotics has something to learn from animation and mobility design. Movement can make a machine feel intentional. Poor movement can make the same machine feel unsafe, irritating, or alive in the wrong way. As robots enter shared spaces, the strongest products will be the ones untrained people can understand quickly.

A robot communicates through its body, not through a display.

02 Form and CMF.

Physical presence, proportion, material, and finish signal purpose and approachability before any interaction begins.

When a machine shares space with people, its materials and form make an immediate, often unconscious judgment in the viewer’s mind: Is this safe? Is it competent? Should I move, or ignore it? That judgment happens in milliseconds and is governed entirely by design decisions - scale and proportion (capable but not threatening), material and finish (soft, matte surfaces read as domestic; hard, glossy ones read as machinery to keep distance from), and visual weight (a low, stable centre of gravity reads as reliable). Adoption is frequently blocked by human discomfort.

A robot’s physical form determines whether people trust it – and trust drives adoption.

03 Brand personality and character.

A robot needs an identity that aligns with the operator's brand and its own function.

This does not mean giving every robot a face, name, voice, and backstory. In many cases, that would be the wrong answer. Character is broader than personality. It is the consistent way a robot appears, behaves, communicates, and fits into the world around it. A luxury hotel concierge robot and a home companion robot may use similar technology, but they should not feel like the same character. This is also where fleet coherence lives: a robot is rarely one object but a family deployed across models and contexts, and it must carry one identity at scale.

The strongest robot identities are not pointless. They're built from role, context, and brand fit.

04 Interaction and UX touchpoints.

Voice, gesture, lights, and touch should be designed scenario by scenario.

Robotics development usually starts from capability - "we built an arm that lifts 5kg." But capability is not a product; a product is a robot doing a specific thing, for a specific person, in a specific place. Often, the specification sheet misses the human interactions needed for adoption, e.g. the height a tray should sit at for comfortable retrieval, the approach angle that feels respectful rather than aggressive, the resting position that doesn't block a hallway.

**Design begins with the moment of use,
not the technical specification.**

05 Narrative and go-to-market strategy.

A robot enters the market with a story.

That story shapes how customers, operators, staff, investors, media, and end users understand it. Is it replacing people? Supporting them? Improving service? If the narrative is unclear, people will create their own. And they may not be generous. It needs a clear product role, a credible promise, launch language that does not overclaim, and communication that helps people understand why the robot belongs.

The operator buys the robot, but the staff and end users decide whether it succeeds.

The bottom line:

Properly designed, a robot is not experienced as an “intrusion” into daily routines. It becomes an understandable and acceptable part of the environment.

That does not happen by accident. It must be designed across form, behaviour, interaction, brand, and communication.

The biggest opportunity gaps for design.

Chapter

04

Across human-facing robotics, we see four major gaps repeatedly appearing between technical capability and real-world acceptance.

01. The ‘brand gap’:

Most service robots ship as white-appliance hardware under the operator’s name. The opportunity is to create robots with a recognisable product and brand language: not just a logo on a shell, but a coherent identity expressed through form, behaviour, interface, sound, movement, and communication.

**A robot can become a brand-defining product.
But only if it is designed as one.**

02. The ‘human-acceptance gap’:

At its worst, the people around robots experience disruption, uncertainty, extra work, irritation, or discomfort. Designing a robot-to-human communication language that feels natural is rare and genuinely difficult and it is a serious driver of adoption.

Operators buy robots. But the users accept or reject them.

03. The ‘first-encounter gap’:

A person’s first interaction with a robot in a service setting is a short, decisive window where trust is built or lost. Designing that moment deliberately is an untapped opportunity when performed by a competent team who understands the user.

A good first encounter needs to be immediately clear.

04. The ‘cultural-implementation gap’:

The same robot category appears and behaves differently across cultures, exactly as in automotive and consumer-product design. Europeans have said for decades that they don’t want robots caring for their loved ones, and the industry keeps building those robots anyway. By understanding cultural reading, products can be designed for it rather than retrofitting around it.

Global robotics need local insights.

What success looks like.

Chapter

05

Success in human-facing robotics should be measured beyond the demo. A robot can get applause at a trade show and still fail in deployment. The more useful question is whether acceptance holds after the novelty fades.

Success can be seen on four levels.



04 Brand level

The robot orientates users around the brand and drives security, desire, and trust.

03 Business level

The design makes the robot adaptable across market and cultural contexts, protecting the platform investment as it scales.

02 Product level

Measurable user satisfaction and interaction quality leads to adoption that holds in deployment, not just applause at a demo.

01 User level

The people who meet it read it as functionally valuable and emotionally desirable; a combination that survives past week two.

Three controversial takes.

Chapter

06

Robotics is too complex for universal rules. But, from a design and brand point of view, these are the conversations more robotics companies should be having earlier.

01

Your robot is a branded touchpoint, whether you design it that way or not.

A human-facing robot is one of the most visible physical expressions of a brand. It moves through the environment. It interacts with people. It is noticed, filmed, discussed, avoided, tested, and judged. That means it cannot be treated as neutral hardware. Brands should shape the robot's behaviour, materiality, communication, and relationship to the people around it to make them a trustworthy brand agent.

02

"Performance-first" creates adoption problems later.

When robotics development starts and ends with technical specification, the human experience is often forced to fit around decisions that have already been locked. Start development from scenarios, roles, and multi-sensory experiences, then work backwards to performance and specification. Design helps technical capability become something people can understand and trust.

03

Responsibility matters more than the rule of cool.

Robotics has a natural pull towards novelty. But a robot made for a trade-show moment can become a problem in daily use. Instead, use design to bake in ethical responsibilities rather than adding them as an afterthought. Today, there's no excuse for design 'misses' on things like perceived safety, inclusivity, and data-handling.



Viktoria Reidl (Strategy Consultant)

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Any brand or company entering robotics must check their priorities. They need to seriously think about how their product looks – not only how it functions technically.

They should adopt an end-consumer lens to evaluate their robotic products: how users see, approach, and experience them in real contexts.”

Most robotic design happens inside robotics companies. But, by bringing in design outside the building and involving an experienced partner, businesses can reduce the risk of building a technically strong product that people do not accept.

What are the risks from this approach?

Chapter

07

Bringing in an outside design partner can create real value, but only if the collaboration is set up properly. Here are five common risks which are worth stating up-front.

01 Design-washing.

The classic failure: bringing design in too late, after the core architecture is locked, which limits the impact to surface aesthetics. If investing in a design agency, involve them strategically, not only decoratively.

02 Scope and handoff friction.

The engineering-design boundary can be unclear. A named, explicit collaboration model is essential from day one for the best results.

03 Timeline compression.

Robotics startups often run against hard investor milestones and chaotic development. Under that pressure, teams default to safe, generic design... which is exactly what reduces impact in the long run.

04 Cultural-deployment misalignment.

A robot designed for Western European hospitality norms may not adapt to Asian markets. The best way to avoid this is discover which you need and choose a partner which can design in global scalability both ways.

05 Over-designing for novelty.

The temptation to make a robot distinctive for a trade-show moment can undermine long-term acceptance. Novelty is not the same thing as desirability.

The question isn't whether you need design. It's whether your design partner understands what's at stake.

KISKA's stance:

KISKA helps robotics companies close the gap between what the machine can do and what people are willing to accept. We believe responsible robots are built from the human encounter outward. That means designing the robot's role, form, behaviour, interaction, brand fit, and communication in partnership – client and design agency – early enough to influence on product adoption level, not just the launch.

How do you maximise the potential of robots?

KISKA.

Closing
statement
from our team.

They will be the ones
people understand.”

The robots that define this decade will not only be the most capable.

They will be the ones people understand. The ones people forgive when they get something slightly wrong. The ones that feel right in a room, clear in their purpose, and natural in the lives around them.

The real opportunity for robotics is not to create machines people simply tolerate because they are useful.

It is to create machines people genuinely need and want around them.

Perhaps, eventually, even machines they desire.