BSC MARKET INTELLIGENCE

Cleaning Robots & Automation

What it takes to run autonomous cleaning robots profitably — market data, utilization economics, and where to deploy first.

The robots are here. Productive hours—not robot count—will decide who wins.

Professional cleaning robot sales grew 34% in 2024 to more than 25,000 units globally. But buying machines is easier than operating them profitably. The decisive metric is verified productive hours per machine, per day.


GAUSIUM PHANTAS


PUDU CC1


LIONSBOT R3 SCRUB


CLEANFIX S170 NAVI

COVER STAT

25,000+

professional cleaning robots sold globally in 2024, up 34% year over year.

EVIDENCE — INDEPENDENT INDUSTRY RESEARCH.

AUDIENCE

Building service contractor owners, operators, technology leaders, and facilities executives.

CORE THESIS

Commercial-cleaning automation is scaling, but the business case depends on productive autonomous hours, route completion, human operating discipline, and documented labor redeployment—not on the number of machines deployed.

KEY FIGURES

25,000+ in 2024
PROFESSIONAL CLEANING ROBOTS SOLD
INDEPENDENT RESEARCH

+34% in 2024
PROFESSIONAL CLEANING ROBOT GROWTH
INDEPENDENT RESEARCH

Nearly 200,000 in 2024
PROFESSIONAL SERVICE ROBOTS SOLD
INDEPENDENT RESEARCH

2.43 million jobs in 2025
JANITOR/BUILDING-CLEANER EMPLOYMENT
PUBLIC DATA

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05	ECONOMICS	The robot is not the cost. Idle time is.
06	VENDOR AND CONTRACT RISK	Buy the operating model, not the logo
07	BUYER DEMAND	Clients do not necessarily want a robot. They want a better outcome.
08	VERTICAL PLAYBOOK	Where to deploy first
09	90-DAY ACTION PLAN	Build an automation program before buying a second robot

14 figures in this edition. Figures tagged **Altus analysis** are arithmetic derived from the cited sources; figures tagged **Illustration** use stated assumptions and are not forecasts.


GAUSIUM PHANTAS

A fast-growing equipment market with no consensus on its size

Analyst forecasts for 2030 cleaning-robot revenue span roughly five-fold, from $10.5B to $52.2B, because firms define the category differently and most include residential vacuums. The narrower, better-measured signals all point the same way: commercial floor-scrubbing automation is outgrowing the scrubber market overall, while the janitorial workforce keeps expanding rather than shrinking.

FIGURE 01.1

MARKET DATA

Market at a glance

$5.98B
Global cleaning-robot market, 2024 (M1)

23.7%
Projected CAGR to 2030 (M1)

41%
Floor-cleaning robots' share of 2024 revenue (M1)

11.0%
Robotic scrubber CAGR — fastest scrubber type, 2023–30 (M2)

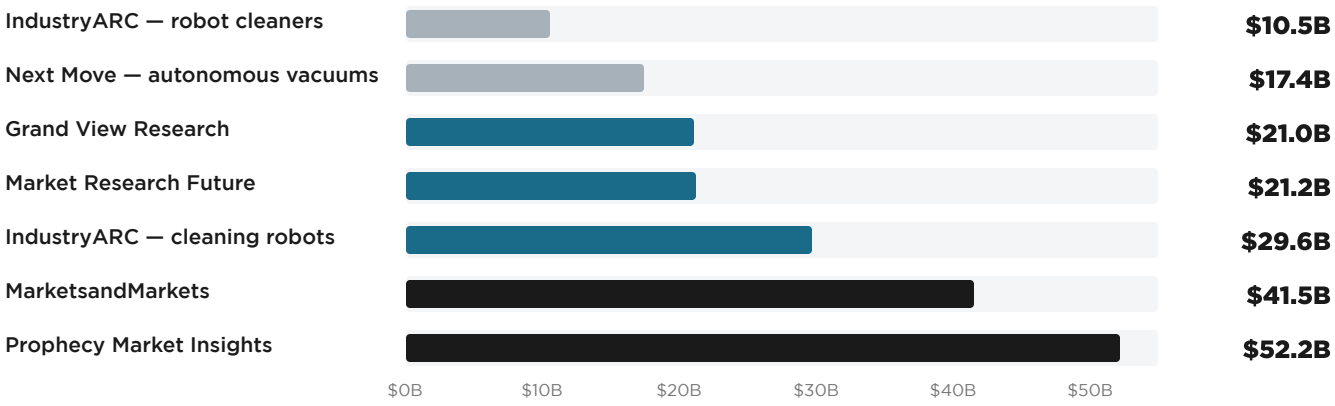
Source — Grand View Research via Research and Markets (M1); Grand View Research (M2)

FIGURE 01.2

INDUSTRY INTELLIGENCE

2030 cleaning-robot forecasts span 5×

Projected 2030 global market size by research firm. Scope differs: most include residential robots; none isolate commercial floor care.



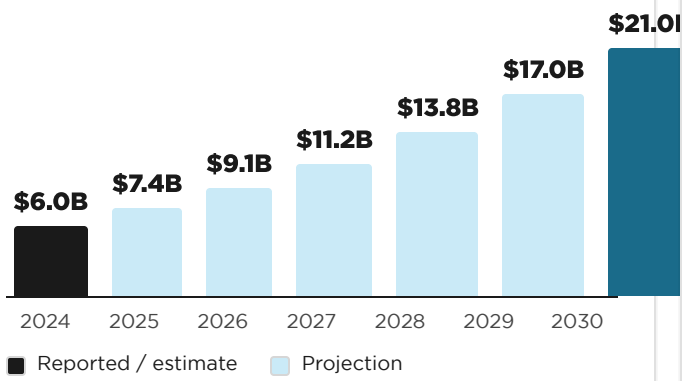
Source — M1, M3–M8

FIGURE 01.3

ALTUS ANALYSIS

Implied path to $21B

Global cleaning-robot market ($B) at a constant 23.3% CAGR between the 2024 estimate and 2030 forecast.



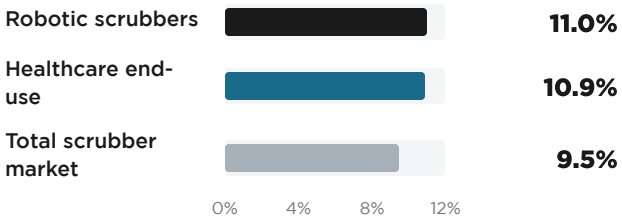
Source — M1 · Altus interpolation

FIGURE 01.4

INDUSTRY INTELLIGENCE

Automation leads equipment growth

Industrial & commercial floor scrubbers, CAGR 2023–2030.



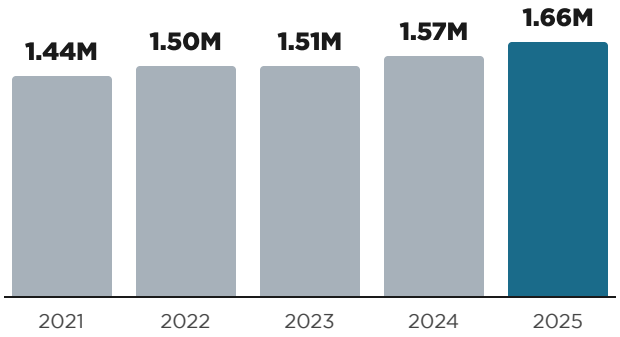
Source — Grand View Research (M2)

FIGURE 01.5

PUBLIC DATA

The workforce is still growing

Full-time wage and salary janitors and building cleaners, U.S. (millions).



Source — BLS Current Population Survey via FRED (M9)

FIGURE 01.6

ALTUS ANALYSIS

What it implies

c. 5×

Spread between the lowest and highest 2030 forecasts ($52.2B ÷ $10.5B)

+1.5 pts

Growth premium of robotic scrubbers over the total scrubber market

+218K

Full-time janitors added 2021–2025 (+15%) while robots scaled

Source — Altus analysis of M1–M9

MARKET DRIVERS SCORECARD

DRIVER	DIRECTION	SIGNAL STRENGTH	READ-THROUGH FOR BSCS	EVIDENCE
Labor cost and availability	Supports automation	High	Labor is the largest controllable cost; robots offset hours, not headcount	PUBLIC DATA
Commercial scrubber automation	Accelerating	High	Robotic scrubbers lead equipment growth — expect clients to ask	INDUSTRY INTELLIGENCE
Workforce growth	Expanding	Medium	Robots are augmenting crews, not replacing them outright	PUBLIC DATA
Forecast uncertainty	Wide	Medium	Build the business case on site hours, not market headlines	ALTUS ANALYSIS

Market Monitor sources

M1 Grand View Research via Research and Markets, Cleaning Robot Market Size & Forecast to 2030. https://www.researchandmarkets.com/report/cleaning-robot

M2 Grand View Research, Industrial & Commercial Floor Scrubbers Market Report, 2030. https://www.grandviewresearch.com/industry-analysis/industrial-commercial-floor-scrubbers-market

M3 IndustryARC, Robot Cleaner Market. https://www.industryarc.com/report/18155/robot-cleaner-market

M4 Next Move Strategy Consulting, Autonomous Robot Vacuum Cleaner Market. https://www.nextmsc.com/report/autonomous-robot-vacuum-cleaner-market-rc3016

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M6 IndustryARC, Cleaning Robot Market. https://www.industryarc.com/report/16194/cleaning-robot-market

M7 MarketsandMarkets, Cleaning Robot Market. https://www.marketsandmarkets.com/Market-Reports/cleaning-robot-market-22726569.html

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M9 U.S. Bureau of Labor Statistics via FRED, Employed full time: janitors and building cleaners (LEU0254494300A). https://fred.stlouisfed.org/series/LEU0254494300A

The robotics market is growing faster than most operating models



PUDU CC1

INDEPENDENT RESEARCH

25,000+ in 2024

PROFESSIONAL CLEANING ROBOTS SOLD

WHY IT MATTERS

Adoption is real and faster than the broader professional service-robot market

INDEPENDENT RESEARCH

+34% in 2024

PROFESSIONAL CLEANING ROBOT GROWTH

WHY IT MATTERS

Cleaning is among the faster-growing professional robot applications

INDEPENDENT RESEARCH

Nearly 200,000 in 2024

PROFESSIONAL SERVICE ROBOTS SOLD

WHY IT MATTERS

Cleaning is a major category, but not the only one competing for capital and talent

PUBLIC DATA

2.43 million jobs in 2025

JANITOR/BUILDING-CLEANER EMPLOYMENT

WHY IT MATTERS

The labor base is large, but replacement demand remains a structural operating challenge

PUBLIC DATA

$17.71/hour in 2025

MEDIAN JANITOR WAGE

WHY IT MATTERS

Automation must be evaluated against fully loaded labor cost, not wage alone

PUBLIC DATA

+2% from 2025–2035

EMPLOYMENT OUTLOOK

WHY IT MATTERS

Most openings reflect replacement needs, not rapid employment growth

PUBLIC DATA

146.124 in April 2026

JANITORIAL-SERVICES PPI

WHY IT MATTERS

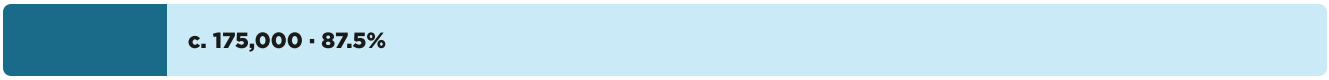
Contract prices and labor productivity must keep pace with service-cost pressure

FIGURE 01.7

INDEPENDENT RESEARCH

Cleaning is roughly one in eight professional service robots sold

Share of the nearly 200,000 professional service robots sold globally in 2024.

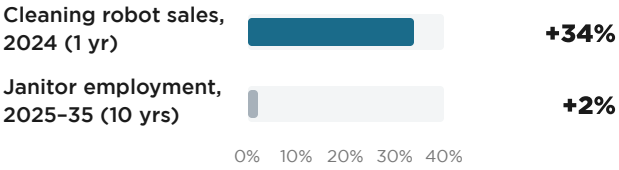


Cleaning robots	c. 25,000 · 12.5%
All other professional service robots	c. 175,000 · 87.5%

Source — IFR, World Robotics 2025 (Source 1) · Altus analysis

FIGURE 01.8

Automation demand vs. labor-base growth

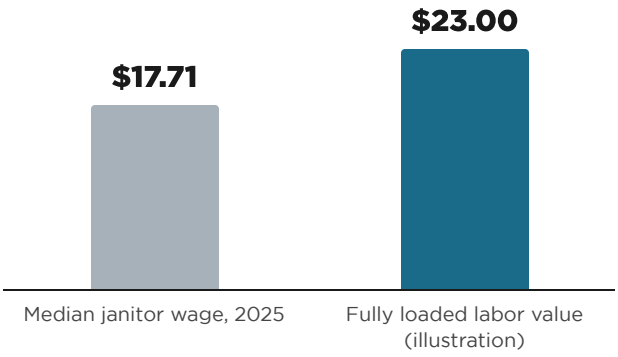


Source — IFR (Source 1); BLS OOH (Source 2)

FIGURE 01.9

Wage is not the full cost

The page 5 illustration assumes c. 30% load over the median wage.



Source — BLS OOH (Source 2); Altus illustration

THE SIGNAL

Robotics is no longer a novelty. Utilization discipline is the competitive separator.

The automation opportunity is not “all cleaning”



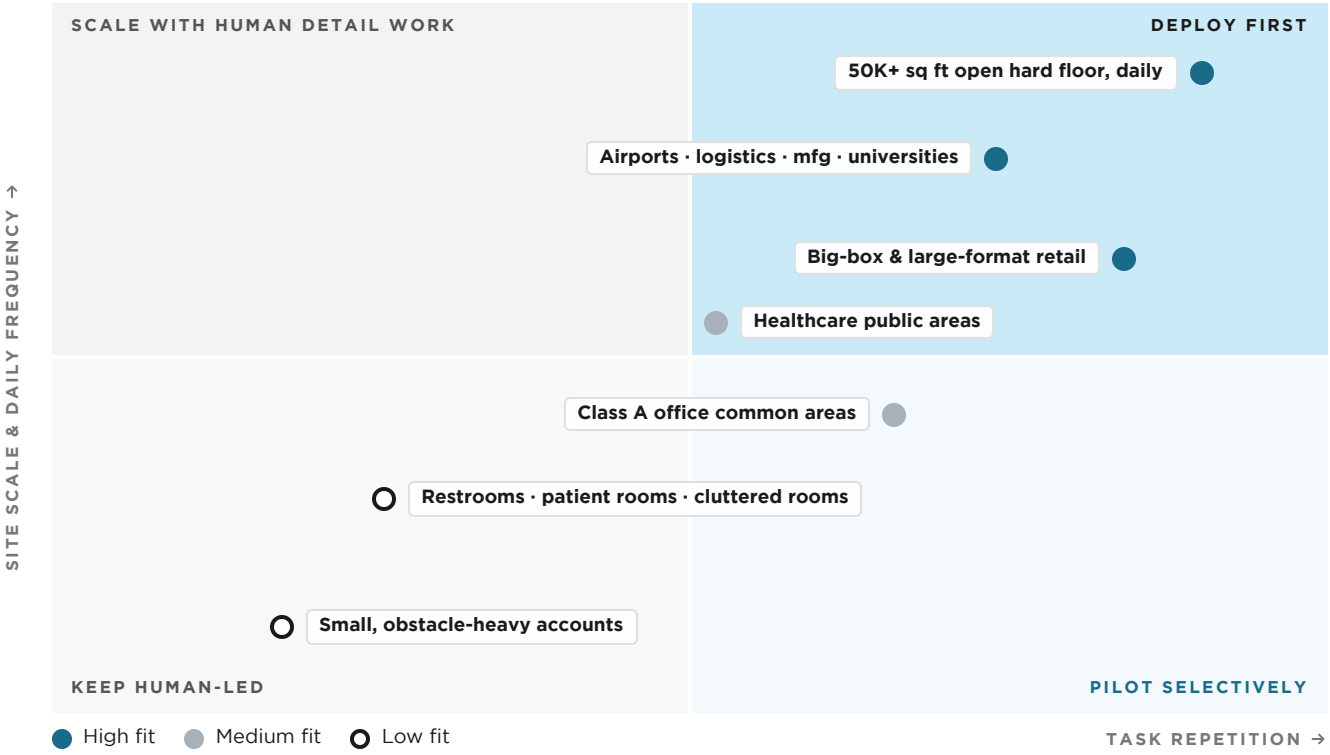
LIONSBOT R3 SCRUB

FIGURE 01.10

ILLUSTRATION

Automation Readiness Map

Automation Readiness Map. Plot task repetition on the x-axis and site scale/daily frequency on the y-axis.



Source — Illustrative placement based on the automation-fit ratings in the table below · Altus analysis

Robots are best deployed where work is repetitive, open, measurable, and scheduled. They are a poor substitute for detail work, irregular spaces, and complex human-facing tasks.

SITE CHARACTERISTIC	AUTOMATION FIT	WHY

50,000+ sq. ft. of open hard floor cleaned daily	High	Routes can generate recurring productive hours
Airports, logistics, manufacturing, universities	High	Large footprints, visible cleaning demand, predictable routes
Big-box retail and large-format stores	High	Broad hard-floor coverage and long operating windows
Class A office common areas	Medium	Floor routes fit, but occupancy patterns matter
Healthcare public areas	Medium	Floor use case is strong but infection-control requirements add complexity
Restrooms, patient rooms, cluttered rooms	Low to emerging	Variation and detail work still require trained people
Small, obstacle-heavy accounts	Low	Setup, intervention, and moving costs overwhelm potential savings

WHAT TO SELL

A paid or creditable Automation Readiness Assessment before a robot pilot.



CLEANFIX S170 NAVI

Fleet growth is not productive growth

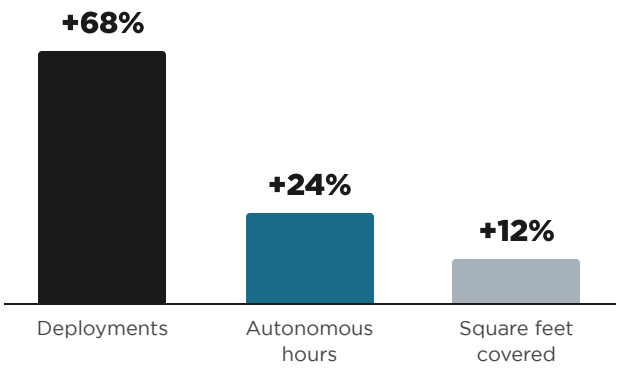
Deployments are not the same thing as productive work. Brain Corp reported 50,000 robots in its fleet in H1 2026; deployments grew 68% year over year while autonomous hours grew 24% and square footage covered grew 12%.

FIGURE 01.11

VENDOR-REPORTED

The fleet is outgrowing the work

Year-over-year growth, H1 2026.



Source — Brain Corp H1 2026 (Source 4)

FIGURE 01.12

ALTUS ANALYSIS

What the fleet numbers imply

c. 106 hrs

Autonomous hours per robot in H1 2026 (5.3M ÷ 50,000)

c. 0.6 hrs

Fleet-average autonomous hours per robot per day across the 181-day half

–26%

Implied YoY change in hours per deployed robot (1.24 ÷ 1.68 – 1)

Source — Altus analysis of vendor-reported figures. Fleet averages include units deployed mid-period; directional only.

METRIC	H1 2026 SIGNAL	MANAGEMENT QUESTION
Fleet/deployments	50,000 robots; +68% YoY	How many machines are actively used?
Autonomous hours	5.3 million; +24% YoY	Are hours scaling as fast as the fleet?
Square feet covered	3.7 billion; +12% YoY	Is route productivity improving?

CORE KPI

Utilization rate = $\frac{\text{Autonomous productive hours}}{\text{Available operating hours}}$

REQUIRE THESE FIVE METRICS FROM EVERY SUPPLIER OR INTERNAL PILOT

- Productive autonomous hours per machine per day
- Manual interventions per 100 operating hours
- Labor hours redeployed to higher-value work
- Percentage of scheduled routes completed
- Productive square feet per autonomous hour

WHAT IT MEANS FOR YOUR P&L

A parked machine is a recurring cost. A machine with a daily route, accountable operator, and client-facing performance report can create measurable labor capacity.

The robot is not the cost. Idle time is.



GAUSIUM PHANTAS

OPERATING CASE	PRODUCTIVE USE	COMMERCIAL IMPLICATION
Underutilized	Less than 2 hours/day or fewer than 3 days/week	Subscription is likely a margin drag
Viable	3–5 hours/day with daily scheduled routes	Labor redeployment can support recurring cost
High-performing	5+ hours/day; multiple routes or shifts; reporting discipline	Can produce scalable contribution and differentiation

ILLUSTRATION — REPLACE WITH ACCOUNT DATA

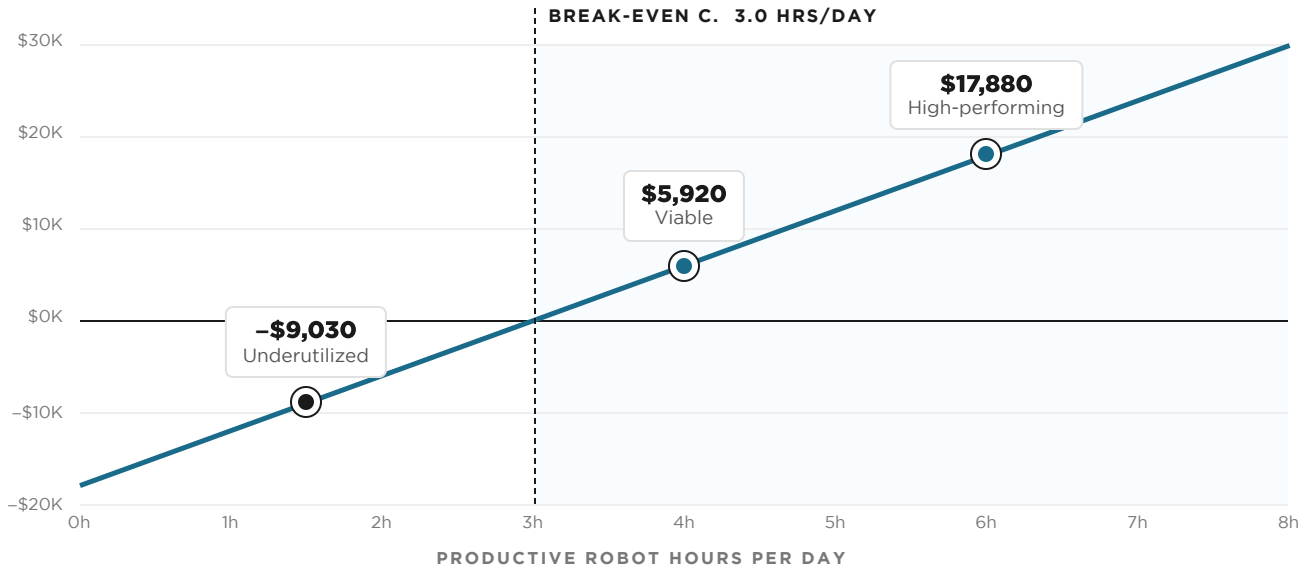
ASSUMPTION	UNDERUTILIZED	VIABLE	HIGH-PERFORMING
Productive robot hours/day	1.5	4.0	6.0
Operating days/year	260	260	260
Productive hours/year	390	1,040	1,560
Fully loaded labor value/hour	$23	$23	$23
Gross labor capacity value	$8,970	$23,920	$35,880
Annual robot cost	$18,000	$18,000	$18,000
Contribution before setup/management	-$9,030	$5,920	$17,880

FIGURE 01.13

ILLUSTRATION

Contribution rises $5,980 for every productive hour per day

Net annual contribution before setup and management. Assumes 260 operating days, $23/hr labor value and $18,000 annual robot cost.



Source — Altus illustration from the table above — not a quote or forecast

FIGURE 01.14

ALTUS ANALYSIS

Utilization math

3.0 hrs
Productive hours per day needed to cover an $18,000 robot at $23/hr

$5,980
Annual labor-capacity value of each additional productive hour per day (260 × $23)

$26,910
Swing in annual contribution between the underutilized and high-performing cases

Source — Altus analysis of the page 5 illustration

CORE FORMULAS

Annual labor capacity released =

Robot productive hours per year × Equivalent manual labor avoided per robot hour

Net annual contribution =

Labor capacity value – Subscription – Maintenance – Operator time – Deployment/training cost

ILLUSTRATION DISCLAIMER This is not a quote or forecast. Replace utilization, labor burden, machine cost, interventions, and supervision assumptions with account-specific operating data.

Buy the operating model, not the logo



PUDU CC1

DECISION FACTOR	QUESTION TO ASK
Commercial model	Is the offer purchase, lease, or Robotics-as-a-Service?
Exit rights	What happens if the account is lost or no longer fits the robot?
Data rights	Who owns route, utilization, and proof-of-service data?
Service levels	What are repair, replacement, response-time, and uptime commitments?
Fleet interoperability	Can your operating system support more than one machine brand?
Site transfer	Can a machine move between accounts without financial penalties?
Cybersecurity	What connectivity, access-control, and data requirements apply?
Supplier concentration	What happens if the vendor is acquired or changes support terms?

OPERATING PRINCIPLE

A machine purchase without route design, accountable operators, maintenance expectations, and performance reporting is not an automation program.

Clients do not necessarily want a robot. They want a better outcome.



LIONSBOT R3 SCRUB

BUYER	PRIMARY CONCERN	BEST AUTOMATION PROPOSITION
Facilities executive	Cost control and staffing resilience	Verified labor capacity and weekly performance reporting
Property manager	Tenant and guest experience	Visible cleanliness and fewer response failures
Procurement leader	Reliability and value	Measurable scope, performance evidence, and flexible deployment
Operations leader	Coverage through staffing gaps	Continuity of floor coverage and escalation response

SERVICE PACKAGE

Verified Autonomous Floor Care

- Defined autonomous cleaning hours
- Human detail-cleaning support
- Route-completion service level
- Explicit client and contractor responsibilities
- Floor-coverage target by route
- Weekly utilization report
- Occupancy-based scheduling option


CLEANFIX S170 NAVI

Where to deploy first

VERTICAL	FIRST USE CASE	SALES HOOK	MINIMUM PROOF
Airport	Concourse and terminal hard floors	Visible cleanliness during peak passenger periods	Hours, route completion, complaints
Manufacturing	Aisles and open production-adjacent areas	More floor coverage without adding shift labor	Sq. ft./hour and safety measures
University	Student centers and corridors	Consistent coverage through labor turnover	Route logs and staffing coverage
Retail	Main aisles and entrances	A visibly clean store without disrupting associates	Appearance and customer feedback
Office	Lobbies and common areas	Proof of clean matched to occupancy	Occupancy-adjusted schedule
Healthcare	Approved nonclinical public areas	Documented support within infection-control rules	Approved route and audit trail

Build an automation program before buying a second robot



GAUSIUM PHANTAS

01 Identify five accounts with the most repetitive hard-floor work.

02 Score each site for area, route consistency, operating window, access, and supervisor capacity.

03 Establish a 30-day utilization baseline before expansion.

04 Assign a named robot operator with training, pay progression, and accountability.

05 Review productive hours, interventions, route completion, and redeployed labor weekly.

06 Build the client-facing performance report before the pilot begins.

07 Require exit, transfer, data-access, and service-level terms in every agreement.

WEEKLY EXECUTIVE KPIS

- Productive autonomous hours per unit
- Manual interventions per 100 autonomous hours
- Percentage of scheduled routes completed
- Labor hours redeployed to detail, restroom, or customer-facing work

Sources and methodology

Evidence hierarchy

- **Public data:** Government or regulatory sources
- **Independent research:** Recognized research institutions and industry associations
- **Industry intelligence:** Trade media and sector reporting
- **Vendor-reported:** Manufacturer claims, customer cases, and vendor pricing
- **Illustration:** Altus modeling assumptions; not forecasts

Sources

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Methodology note

All cited figures should be reconfirmed immediately before publication. Vendor data must remain labeled in charts and captions. ROI illustrations are not forecasts and must show the stated assumptions.