

AOYAMA

Intelligent Food Delivery Robot



AOYAMA ELEVATOR GLOBAL LTD.

Scenario Pain Point Analysis

AOYAMA

High cost

- High rent utilities ingredients and labor costs continuously squeeze corporate profits.
- Costs are rising every year but revenue is difficult to increase significantly in a short time. Companies are encountering difficulties in business growth.

Hard to find employees

- With low salaries few holidays and insufficient space for career development the catering industry is less attractive to the younger generation.
- Young people have more career choices.

High staff turnover

- The report shows that the turnover rate of the catering industry is as high as 42.9%.
- A too high turnover rate not only increases the training cost but also reduces the service quality.

Difficult to acquire and retain customers

- As customers are increasingly demanding better dishes dining environment and services restaurants need to make marketing highlights relentlessly.
- The online platform has become an important criteria for restaurant choosing so it's crucial to maintain a good online image and a good reputation.

Strengths of Robots

A O Y A M A

Low cost

- The comprehensive cost of a robot costs far less than a waiter's salary.
- As the technology and product become more mature and stable the costs of robots are getting lower and the cost recovery period is getting shorter.

Long service life

- The robot has a service life of 5 to 8 years with a daily delivery of 400 to 600 dishes.
- Continuous upgrade makes the robot more powerful and its performance more stable.

Product Standardization

- Standardized deployment for robot product and services flexible and easy to use.
- The restaurant can flexibly purchase or lease during peak and slack periods getting rid of hiring troubles and saving operating costs.

Marketing Highlights

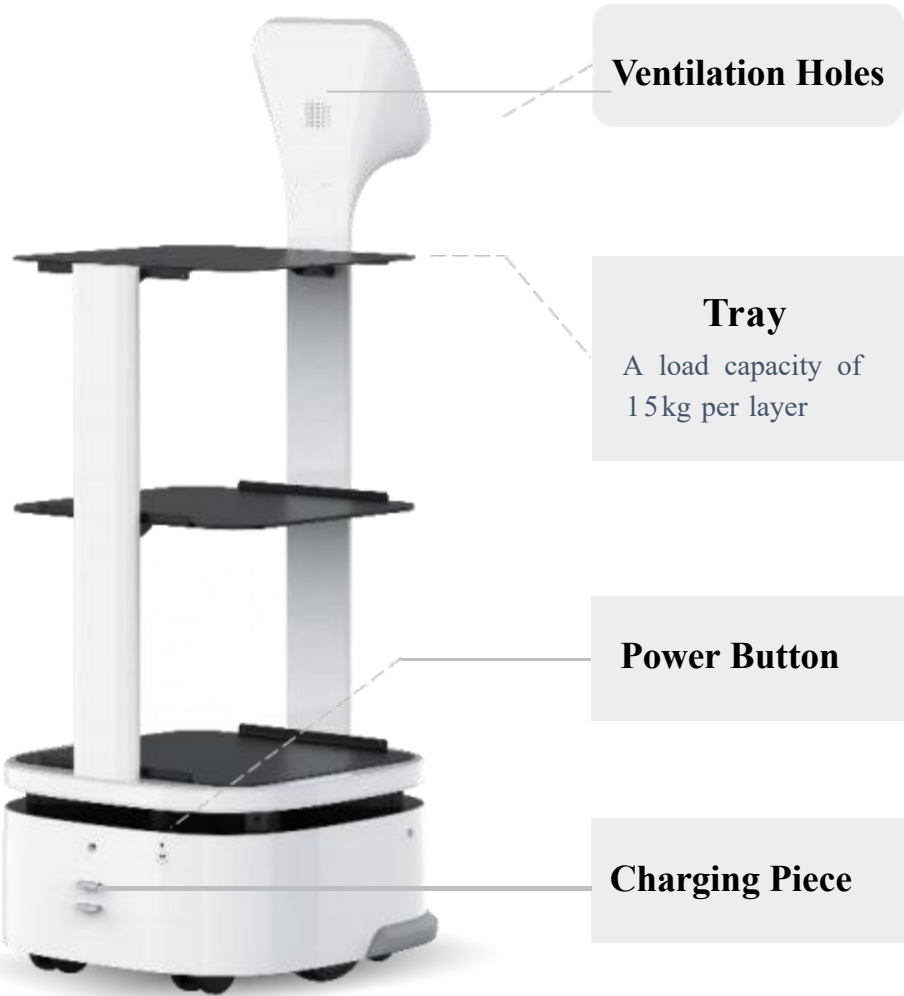
- The application of robots in restaurants is ascending. At this stage robots can be a marketing highlight to attract customers.

Robot's Solution: Integrated Full-Link High-End Intelligent Catering Service Chain



Product Profile

AOYAMA



Product Parameters

A O Y A M A

	Items	Parameters
Application scenarios and basic information	Application Scenarios	Indoor
	Recommended operating temperature:	0 to 40°C
	Storage temperature:	-25 to 55°C
	Product size	572mm (front-to-rear length) *520mm (width) *1270mm (height)
	Weight	60kg(Excluding translucent dish protective cover)
	Appearance material	ABS sheet metal etc.
	Tray layers:	3 layers with (a net height of 325mm)/4 layers (with a net height of 215mm)the maximum load capacity of 15kg for a single layer.
	Tray size	400*420 (width) Without installing the protective cover the dish can exceed the tray by 5cm on the left and right sides. Moreover the dish on the top layer can exceed the tray by extra 5cm on the rear side.
	Translucent dish protective cover (optional)	For 3-layer delivery robot version only. The material of the cover is translucent black acrylic.

	Items	Parameters
Chassis navigation and motion capabilities	Wheel set suspension system	4 supporting universal wheels + 2 main driving wheel differential steering+ Robint' s shock- absorbing buffer suspension system specialized for food delivery.
	Turning radius	30cm
	Speed	0 to 1.2m/s automatic speed change Default: 0.6 to 0.8 m/s (conventional safe speed)
	Obstacle crossing height	25mm
	Ditch crossing distance	25mm
	Height of chassis above the ground	34mm
	Slope climbing	≥ 3° (The robot's capability supports up to 7°but the limit is set to be less than 3° to prevent food spilling.)
	Automatic recharge	Yes
	Navigation accuracy	± 5cm
	Lidar	Farthest distance : 40m with a deviation of ± 3cm angle resolution: 0.33°Detection range : 360°
	ToF Camera	Visual sensor depth camera: minimum sensing depth 0.11msensing distance 10mresolution 1280 x 800
	Ultrasonic sensor	2 sets
	IMU	6-axis

	Items	Parameters
Interactive information	CPU	2-core Cortex-A72 + 4-core Cortex-A53Clock speed: 1.8GHz
	Operating system	Linux Android
	Network	4G / Wi-Fi
	Screen	10.1-inch 2K resolution LCD touch screen 60Hz
	Camera	2 million pixels diagonal Fov145°
	Status light	Blue floor atmosphere lights
Power source	Battery	24V 30Ah 18650 lithium batteries
	Performance	3-4h for full charger Battery life: 6-8h
	Input of the charging pile	AC 110-240V50/60 Hz
	Power of the charging pile	300W a maximum charging current of 10A
	Energy consumption of the charging pile	< 2kWh/day

3 Autonomous navigation

Self-developed modular sports chassis , Multi-sensor fusion positioning can realize autonomous and precise navigation, 3 D omnidirectional obstacle avoidance, and more flexible delivery in complex environments.

1

Rapid deployment

Super sports chassis, multi-sensor fusion, the robot is ready to use , no need to change the environment.

2

Multi-point Delivery, multi-layer heavy load

Large multi-layer tray, which can load up to 10kg/ layer. Multi-point Delivery, Multi-task parallel.



Multi-mode interaction, humanized experience

4

Voice interaction and UI interaction

Long battery life, automatic commuting

5

The robot can work continuously for 10-12 hours, after completing the task, it will automatically recharge.

Agustin Intelligent Food Delivery Robot

Features



Multi- point delivery

- Multi-point delivery service
- Multiple standby points
- Automatically working and resting



Pickup/ delivery assistance

- Place order by the Mini program/ App
- Up to 10 points
- Notify when arriving the point



Cruising for advertisement

- Automatic food delivery
- Cruising and bringing dishes back
- Cruising and promoting



Reception

- Fixed-point reception
- Greeting customers and say hi
- Road guide



Road guide

- Voice interaction
- Intelligent guiding
- Automatic return

More features are waiting for you to explore...

AOYAMA

Multi-point Delivery

AOYAMA



Standby point

Dining table

Multi-point delivery

The robot can wait at the standby point (e.g. Pass-through window). The staff can assign the robot to perform multi-point delivery of up to 10 locations per time by operating the robot screen.

- Box reminding
- Automatically working and resting
- Optimal path planning
- Spill- proof design



Set the dish pick-up point working and resting time voice mode click next



Long press and drag the delivery points in the location list to arrange delivery according to the actual box locations.



Follow the cues to select the corresponding delivery point for each of the three layers and click GO.



Dishes will be delivered in sequence and then taken out by a waiter/ waitress until the last delivery point.

Special Features & Services

AOYAMA

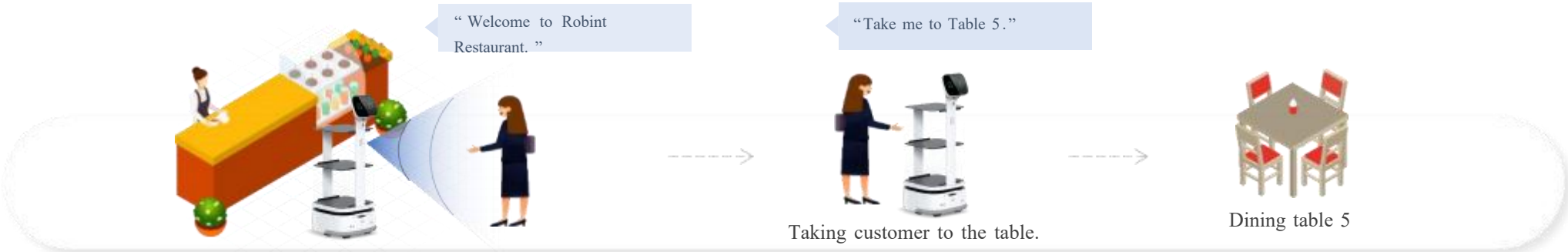
Deliver snacks or cruising and delivering food in a buffet restaurant
cruising and distributing materials in an exhibition or conference

Cruising for advertisement



Attracting greeting and guiding customers at the door.

Reception



Deliver a take to the customer on his/her birthday.

Birthday songs



Competitor Analysis

AOYAMA

Brand	AGUSTIN	Q	P	L	Y
Production base	Beijing	Shanghai	Shenzhen	Beijing	Beijing
Charging mode	Automatic recharge with a free charging pile	Direct charging charging piles are sold separately	Direct chargingcharging piles are sold separately	Direct chargingcharging piles are sold separately	Automatic recharge charging piles are sold separately
Navigation mode	Laser + Vision	Laser + Vision + QR Code	Laser + Vision + QR Code	Laser + Vision + QR Code	Laser + Vision + QR Code
Slope climbing capability	<7°	<5°	<5°	<5°	<5°
Two- way movement	Yes	No	No	No	Yes
Custom Q& A	Yes. 1000 custom Q&A	No	No	Yes	No
Fall protection	Yes	No	No	No	No
Tray load	15kg/layer	10kg/layer	10kg/layer	10kg/layer	10kg/layer
Total load capacity	60kg	40kg	40kg	47kg	45kg
Open interface	Support SDK OpenAPI	No	No	No	No
Construction requirement	Remote deployment without assisted positioning	On- site deployment	On- site deployment	On- site deployment	On- site deployment
QR code assisted positioning	No	Yes	Yes	Yes	Yes
Change location flexibly	Support remote changing	On- site change	On- site change	On- site change	On- site change
Robot chassis	Self- developed	Self- developed	Self- developed	Self- developed	Self- developed
Self- assisted elevator taking	Yes	No	No	No	No
Deliver food to hotel rooms	Support to notify the landline and speaker	No	No	No	No
Deliver in factories	Yes	Yes	Yes	Yes	No
Application scenarios	Indoor some outdoor scenarios	Indoor	Indoor	Indoor	Indoor

More Versions

AOYAMA



Basic version



Enclosed version



Four-layer version

Product List

Pictures shown are for illustration purpose only the actual content is subject to the shipped product.

A O Y A M A



Robot x1



Charing pile (including charging cable) x1



Robot packaging box
680*640*1365 mm (Length*Width*Height) about 8kg



Charging pile packaging box
500*415*440 mm (Length*Width*Height) about 2.8kg



Matched mini programs/ App



User guide (electronic version) x1



SDK/ API development document



After- sales technical support

AOYAMA

What can we bring to your restaurant?



Reduce Labor Costs

AOYAMA

400-600 dishes

Average number of dishes delivered by a robot per day.

50 times

Average guiding times performed by a robot per day.

23.11 CNY

Average hourly wage of an employee in the catering industry (Data from the National Bureau of Statistics)

2 min

Average service time per time.

300 m

Average guiding distance per time.

145 CNY

Daily labor costs saved by a robot.

5h

Labor service time saved per day.

3.75h

Assisted manpower errand service time per day.

52925CNY

Annual labor cost saved.

Improve efficiency

AOYAMA

Employees' recruitment costs

Staff training and appraisal costs

Emotional management cost

Social security and welfare costs

Multi-party income

Ease of work for employees

Employees' self-worth realization

Employees' service quality

Employees' sense of belonging

Operating expenses



Deployment & installation

- No damage to the hotel's internal facilities
- Rapid deployment in 3-5 days
- Very fast after-sales response

Environmental survey

Survey hotel facilities: Determine the location of the front desk , kitchen , restaurant , linen room , guest room and other facilities , whether there is a CAD drawing

Survey physical isolation: Safety gates , steps , slopes ($<8^\circ$) , wading areas , the width of each passing area must be $> 70\text{cm}$, long straight aisles

Survey hall: Can a 10m diameter circle provide location markers

Survey service location: Determine which department provides hotel supplies , goods , meals , rental goods , etc .

Survey charging pile' s location: Ordinary 220V power supply , no obstacles within a radius of 1 m against the wall , flat ground

Survey network: The robot operating environment has 4G signal strength of China Mobile, China Unicom, and Telecom

Survey elevator: The height of each layer,whether there are mirrors in the elevator , the rest see the elevator survey table

Survey phone: Telephone switch model
Export the guest room phone list , including at least room number - corresponding landline number; should configure intranet phone accounts for the robot (N robots + 1 robot)

Admission & deployment

Mapping: Create a map of the route the robot should run

Dot: Dot the locations where the robot will run (see next page for types)

Ladder control equipment installation: The robot , hotel and elevator maintenance team install it together

Telephone system access: Hotel provides telephone system interface

Robot test: Each function test

Delivery & departure

Material delivery: Robot (including charging pile) , guest room smart delivery applet , hotel management background

Use and maintenance training: Make on - site explanation , hand out manual

After - sales technical manager docking: Establish relationship

AOYAMA

Technical Strength

AOYAMA

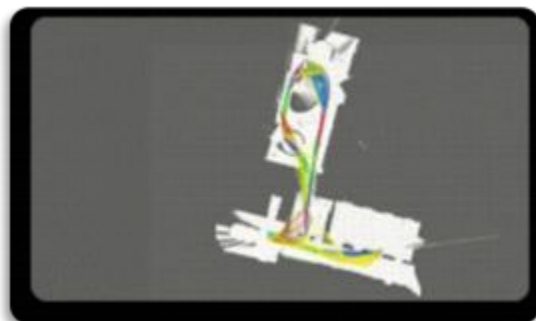
With three core technologies and 130-odd patents for invention, a technical “stronghold” in the industry has taken shape.

50

Patents

High-precision Mapping & Motion Control

high-precision (by centimetre) tech. applied to a single 5000m mapping for the first time and sensor- collaboration- optimized route planning tech. applied to multiple and complicated scenarios



40

Patents

Precise sensing & Smart recognition

The world forefronter in Human tracking technology and the industry leader in object detection and recognition technology

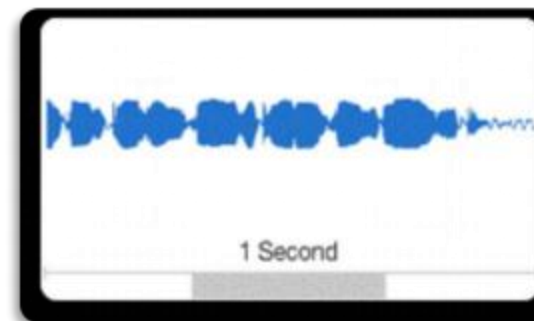


40

Patents

Human-like Cognition & Collaborative Decision Making Technology

the team, combining visual data with voice data, put forward a innovative idea, the smart robot-group collaboration tech. based on human- like cognition, getting ahead of the industry.



Cooperation Hotel

A O Y A M A

