UNIVERSITY OF SURREY

LEVERAGING AI IN HOSPITALITY

DR ERIN LING

The TUCO Conference 2024

AI/WORK/HOSPITALITY

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and the Future of Work

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Erin explores the intersections of **artificial intelligence**, people, businesses, and society, focusing on the applications and implications of AI in the **hospitality** and **tourism** sectors, including AI adoption and use, the future of work, human-AI interaction/teaming, digital marketing, consumer behaviour, and the ethical considerations of AI-assisted systems.

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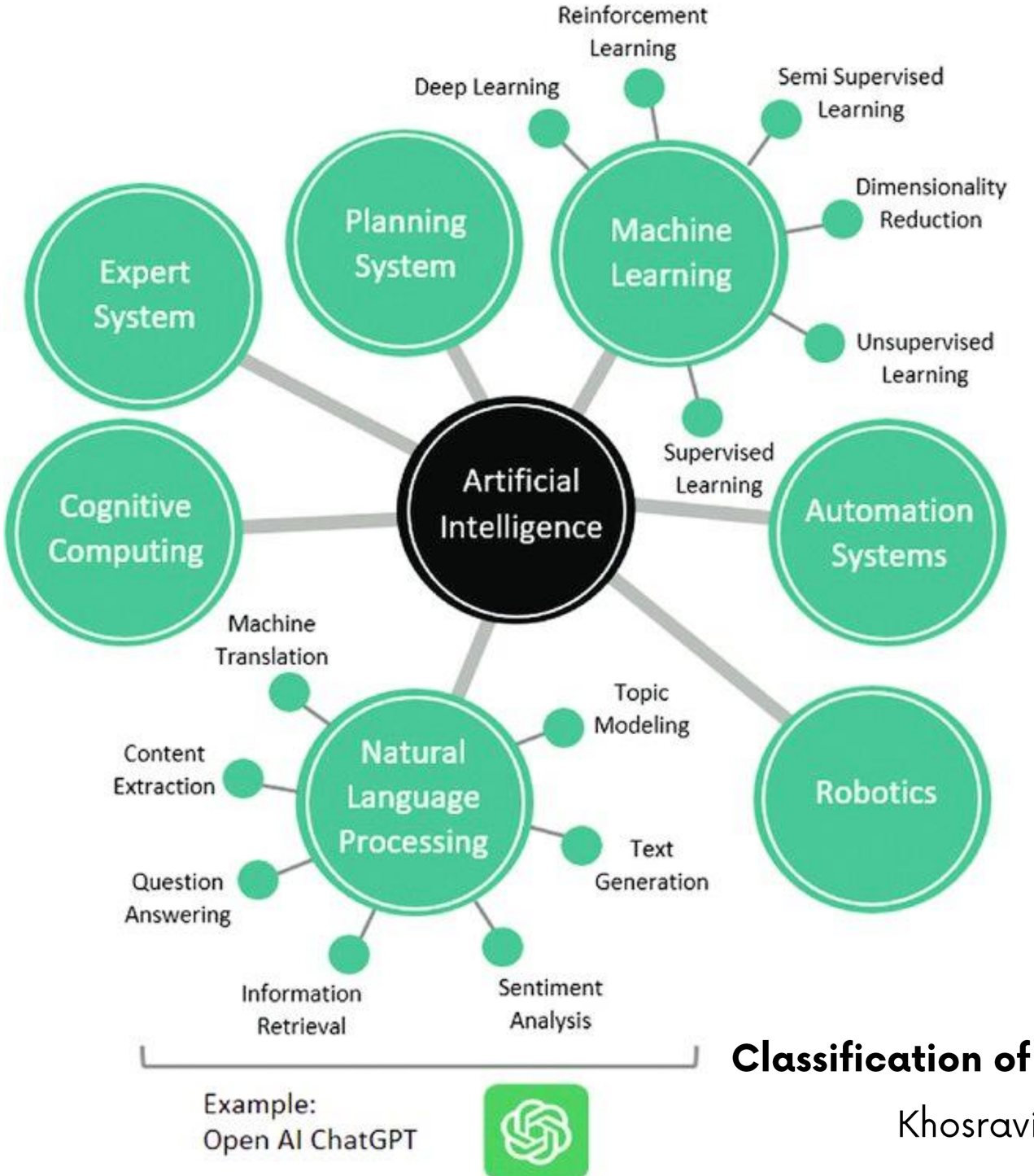
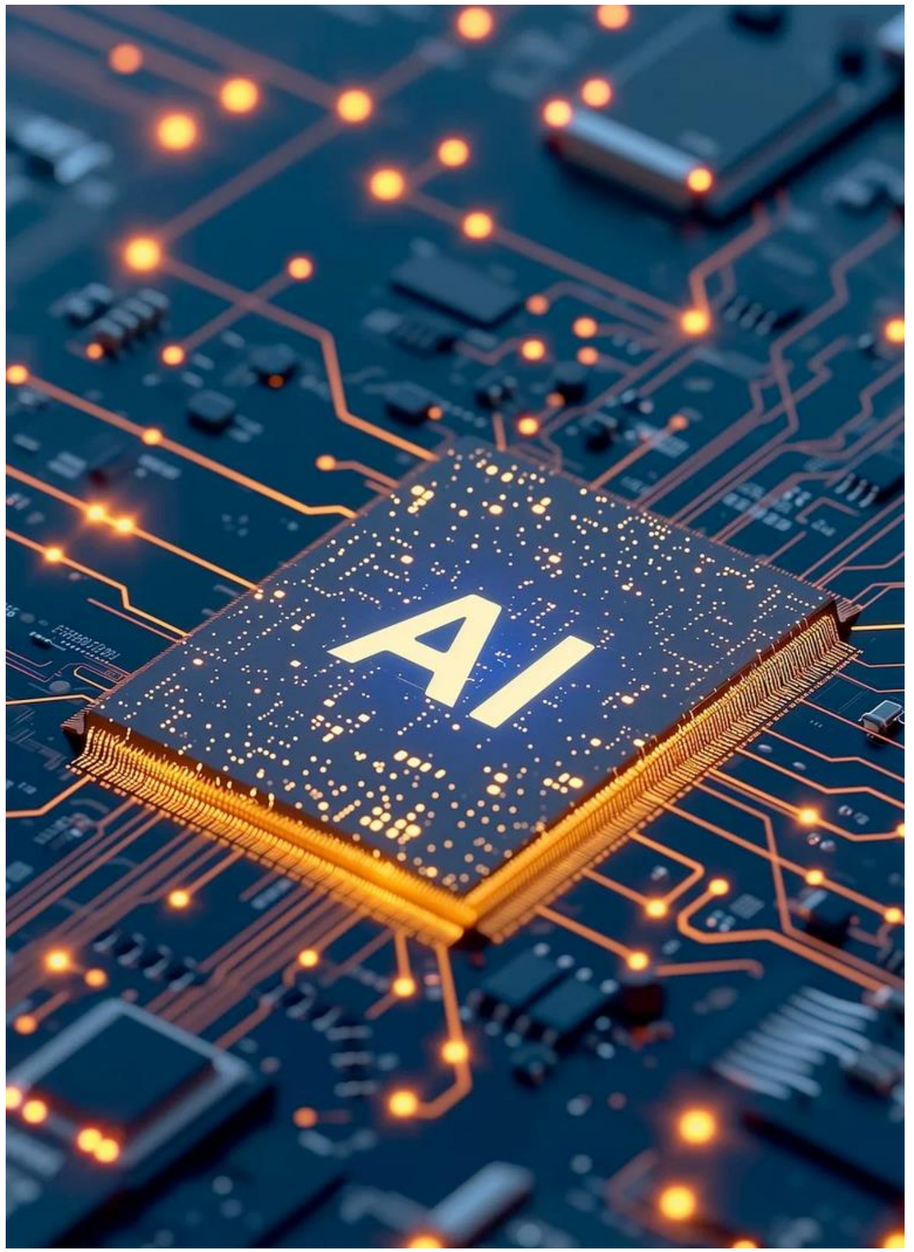
AGENDA

AI & Robots Transform the Food & Restaurant Industry

Real-world Examples & Implications to Campus Catering

Leadership Actions





Classification of artificial intelligence (AI) systems

Khosravi, Sudani & Oladnabi (2023)

Charge
Cocina
1/3
monaco

AI IN RESTAURANTS

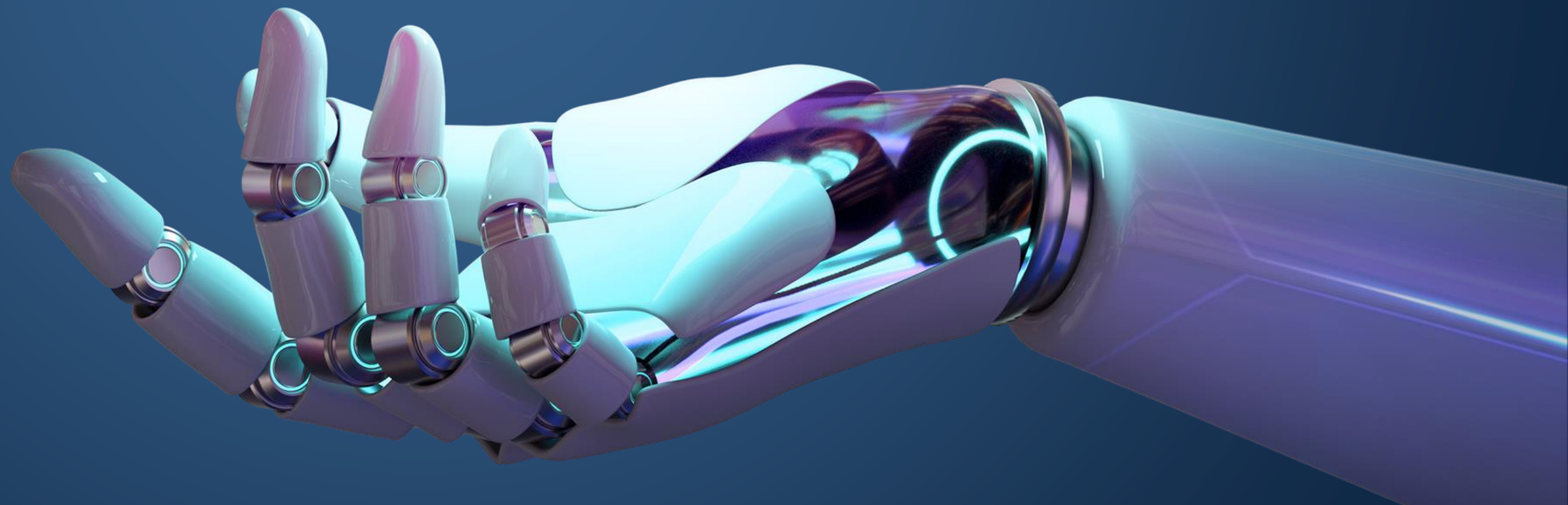
- 01: SERVICE ROBOTICS
- 02: AI ASSISTANTS
- 03: INVENTORY MANAGEMENT
- 04: REAL-TIME FEEDBACK ANALYSIS
- 05: AI SELF-CHECKOUT
- .....

SERVICE ROBOTICS

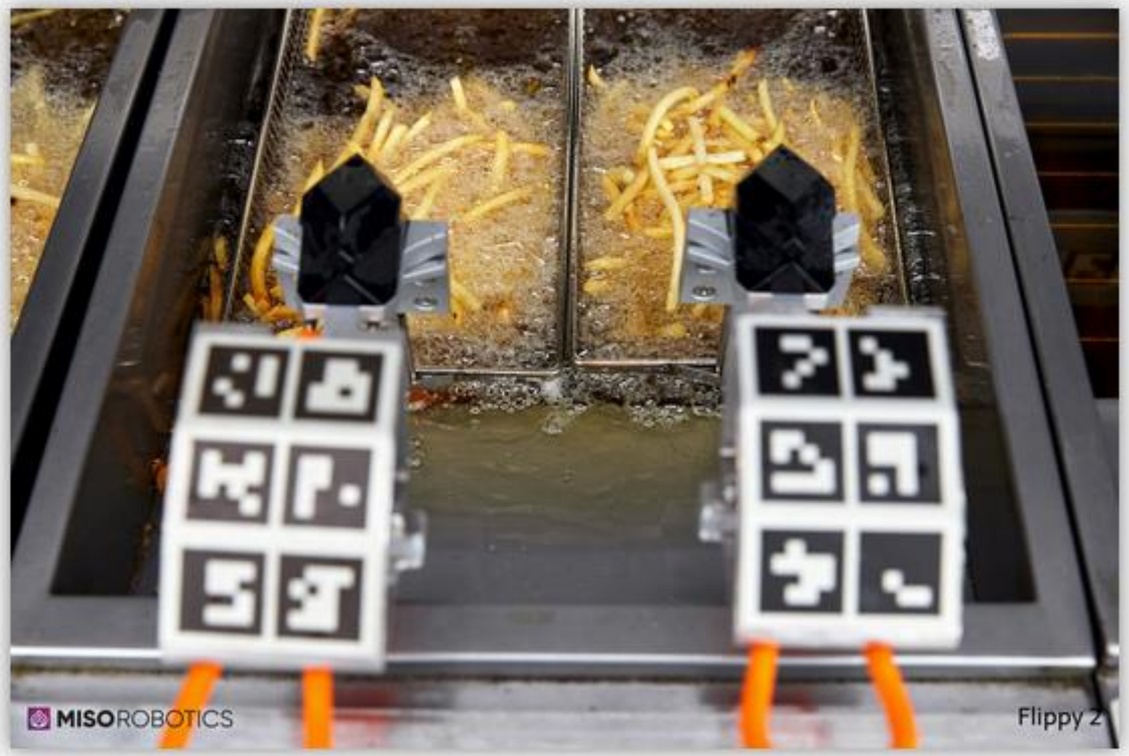
1

Kitchen Robotics

Robotics Delivery



MISO ROBOTICS - Flippy



Automatic dispenser, Autobins, Speciality baskets, Consistency & Speed, Safety

This slide is a video, click the link below to view:

https://www.youtube.com/watch?v=Y1y94D84bm0

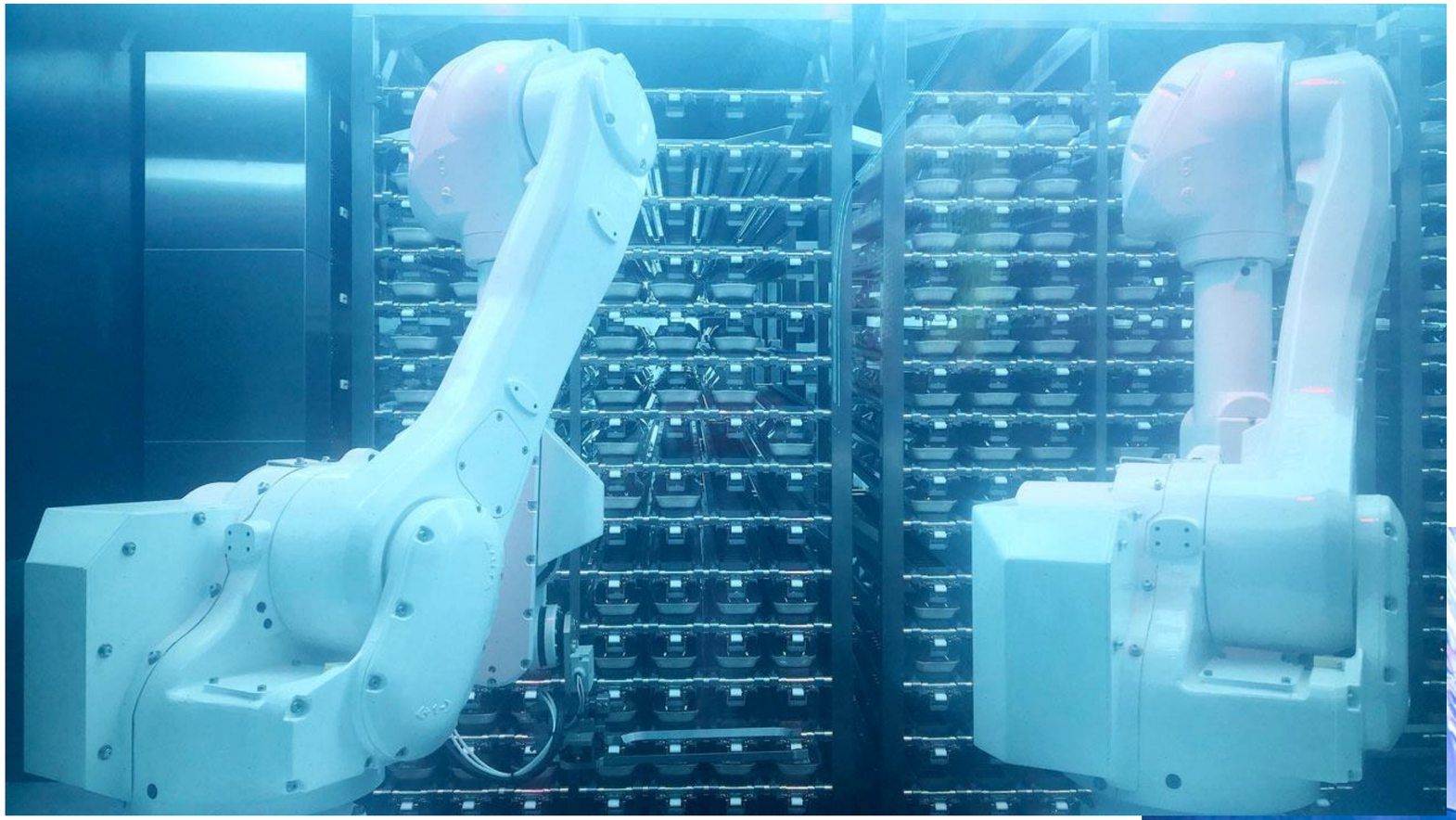
Using scoops, tongs, and spoons, **Alfred** learned to assemble salads and poke bowls, including ingredients such as iceberg lettuce, tuna, and quinoa.

DEXAI ROBOTICS

Blendid has created autonomous, AI-powered robots that can make personalised smoothies.

The company has partnered with several college campuses to bring healthy food options to students, available at any time.

Robot barista in Sungkyunkwan University, South Korea



Haidilao Hot Pot Smart Restaurant in Beijing, China

Beijing's first AI-powered restaurant

Grubhub and Starship Technologies rolled out its robot food delivery service on the Sam Houston State University campus in Huntsville.

Starship Technologies' Autonomous Robots deliver food across university campuses, using AI to navigate and deliver orders directly to students, providing safe and contactless food delivery options. Available at universities including George Mason University and Northern Arizona University.

This slide is a video, click the link below to view:

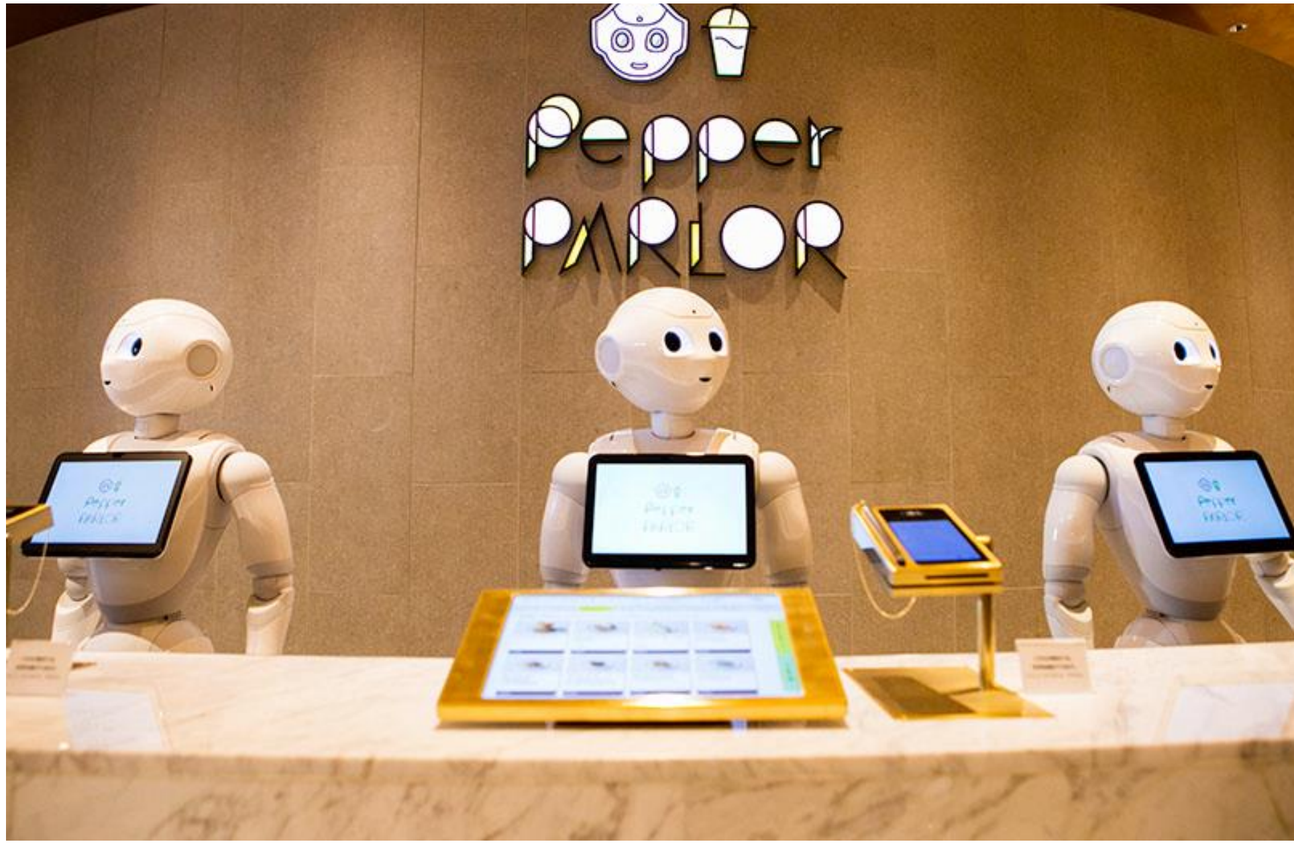
https://www.youtube.com/watch?v=vHSsdpN0JQ4

UK's first university campus robot deliveries

Cranfield University

University of Roehampton

Which one do you trust more?



Technophobia – Robophobia

“Fear of robots and AI systems”

- Negative Attitude toward Robots (NARS):
- Negative attitude toward interacting with robots
- Negative attitude toward robots’ emotion
- Negative attitude toward social influence of robots

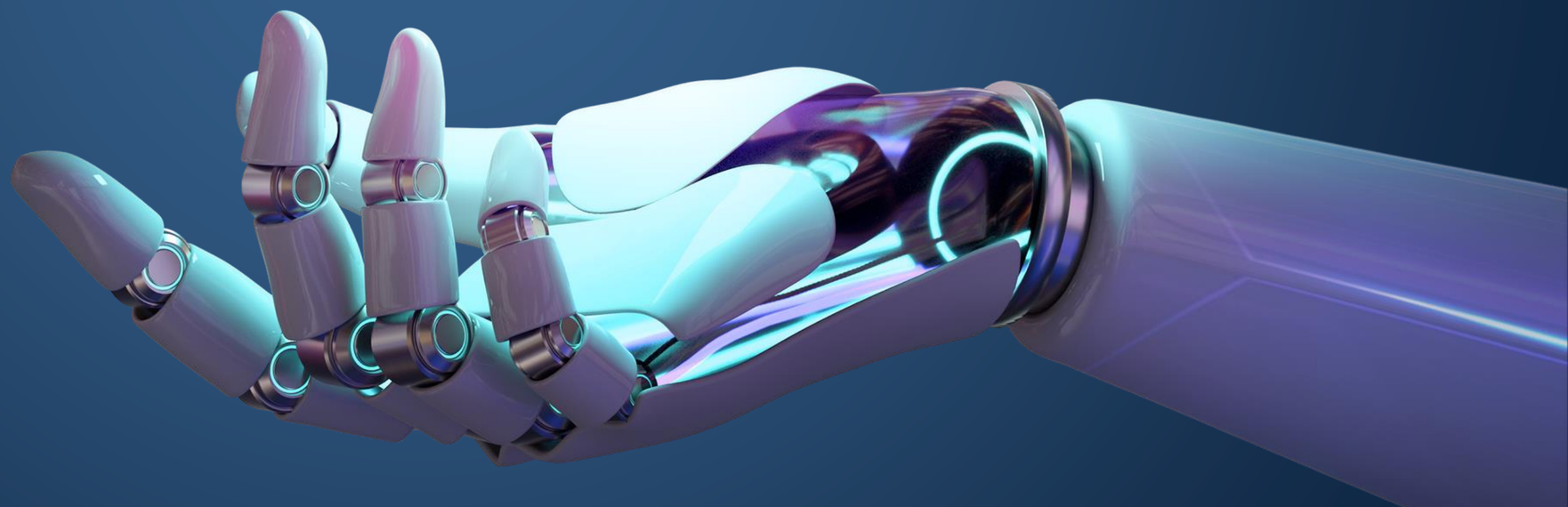
Nomura et al. (2004); Nomura, Kanda, & Suzuki (2006)

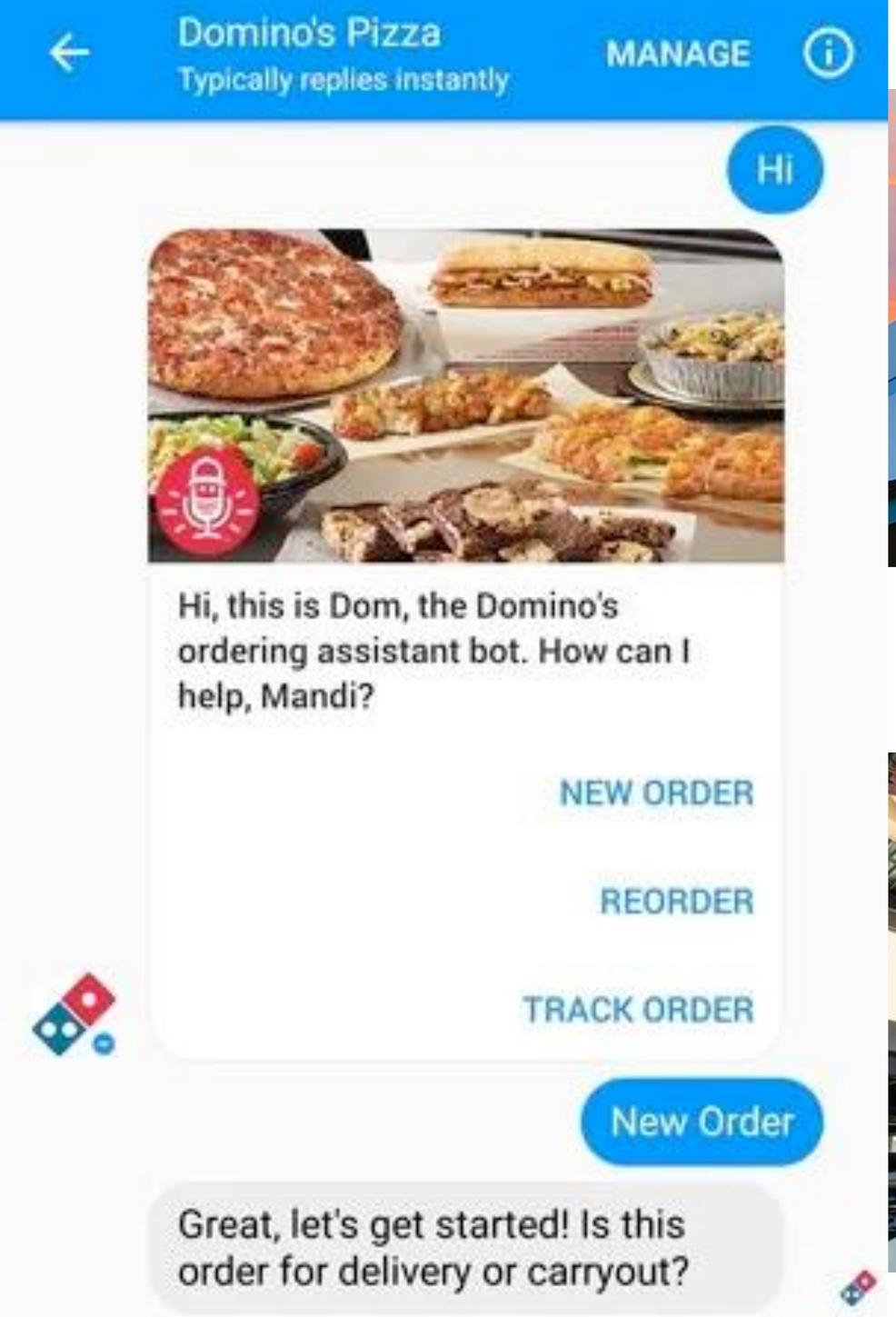
AI ASSISTANTS

2

Chatbots

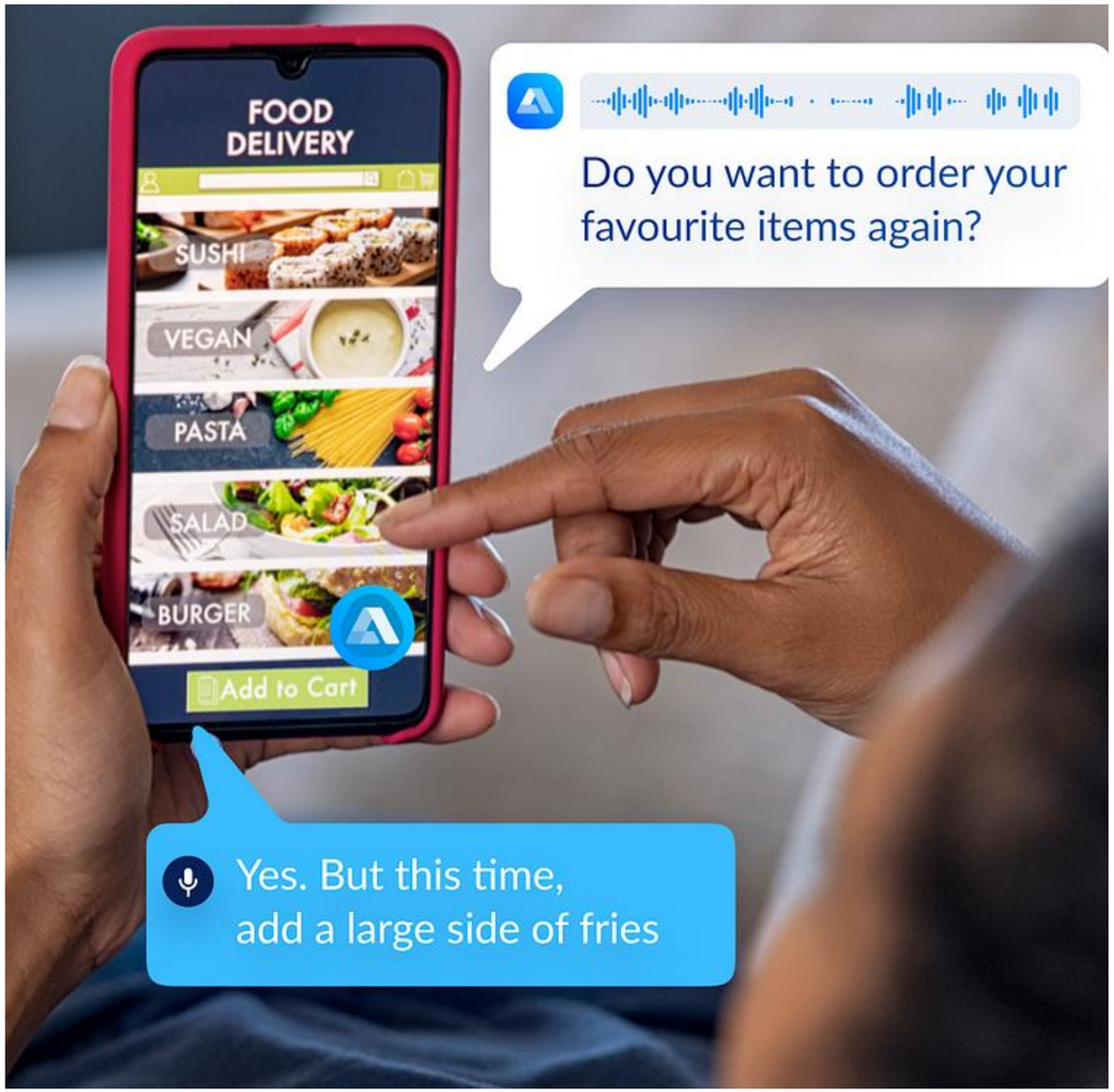
Voice Assistants



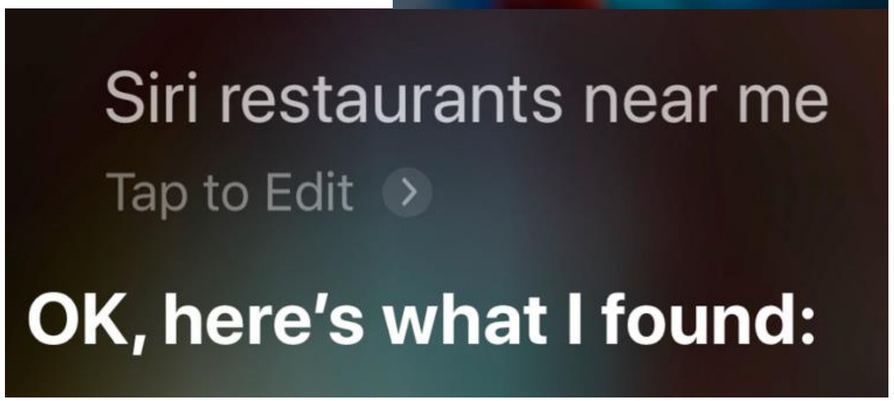


Domino's Pizza is partnering with Microsoft Cloud and Azure OpenAI Service to create a generative AI assistant that can help improve both employee and customer service.

Voice Assistants



Hi, how can I help?



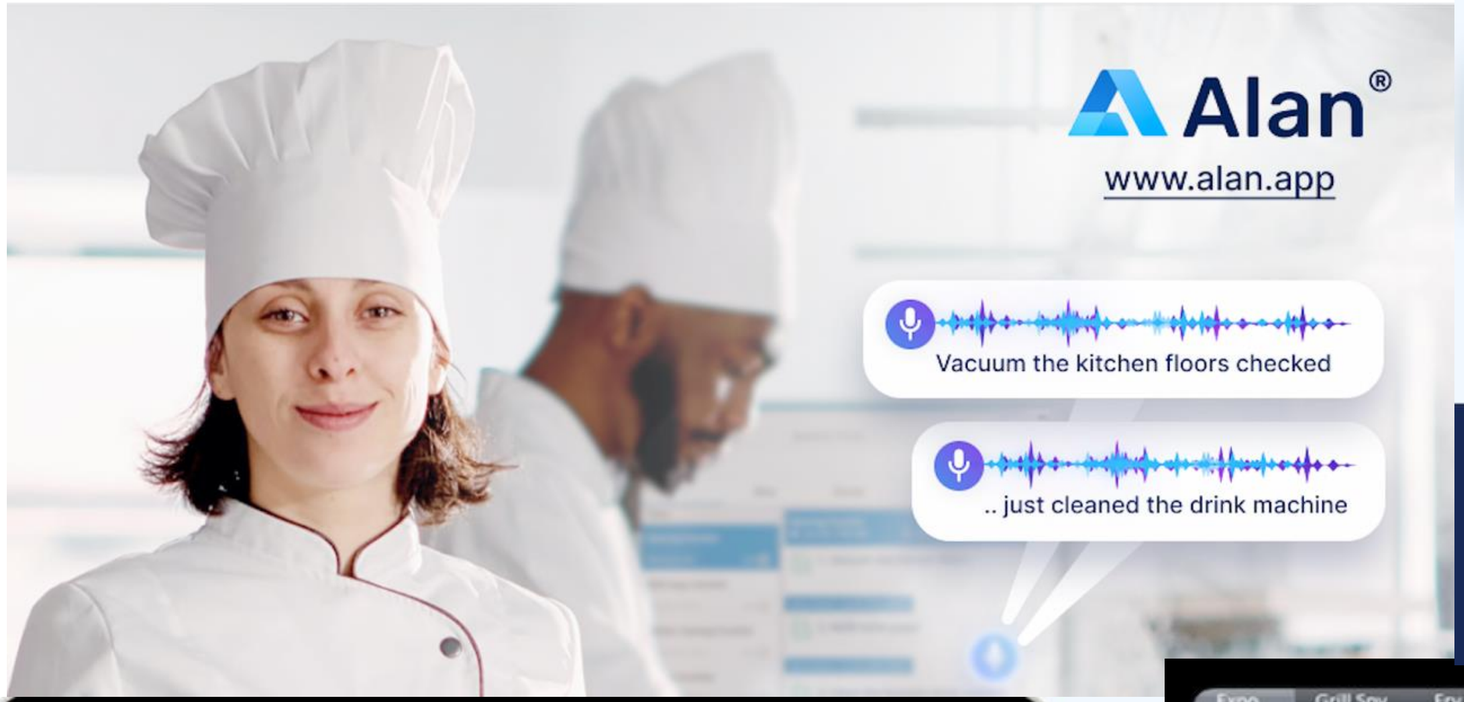
Voice Assistants

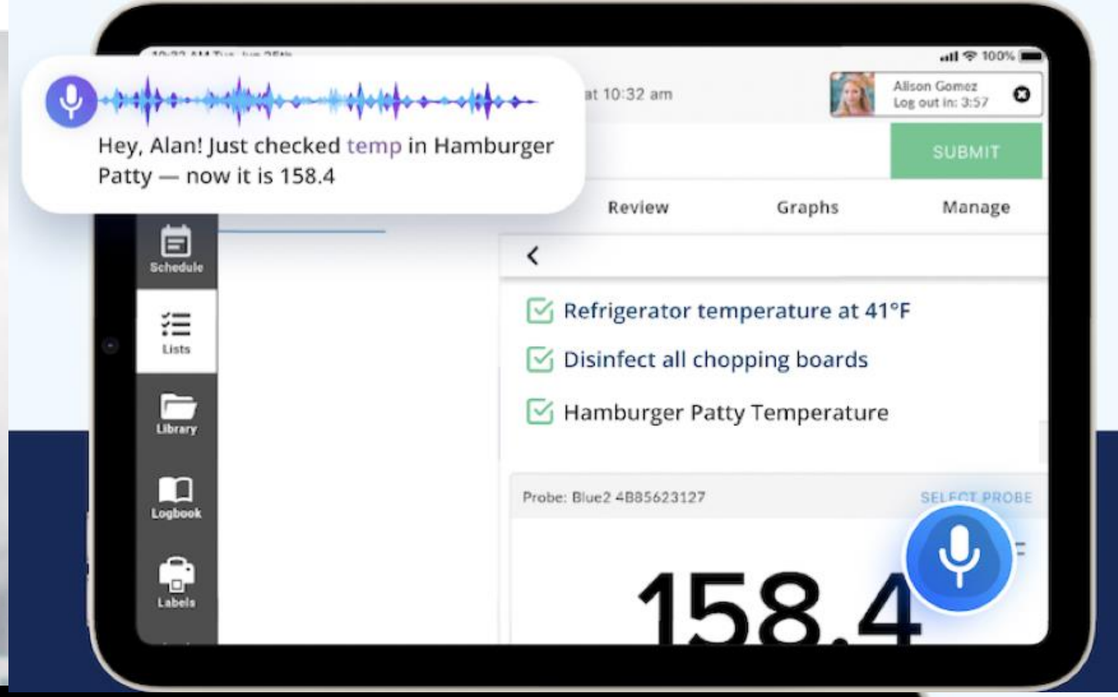
Take orders at Drive-Thru Restaurants

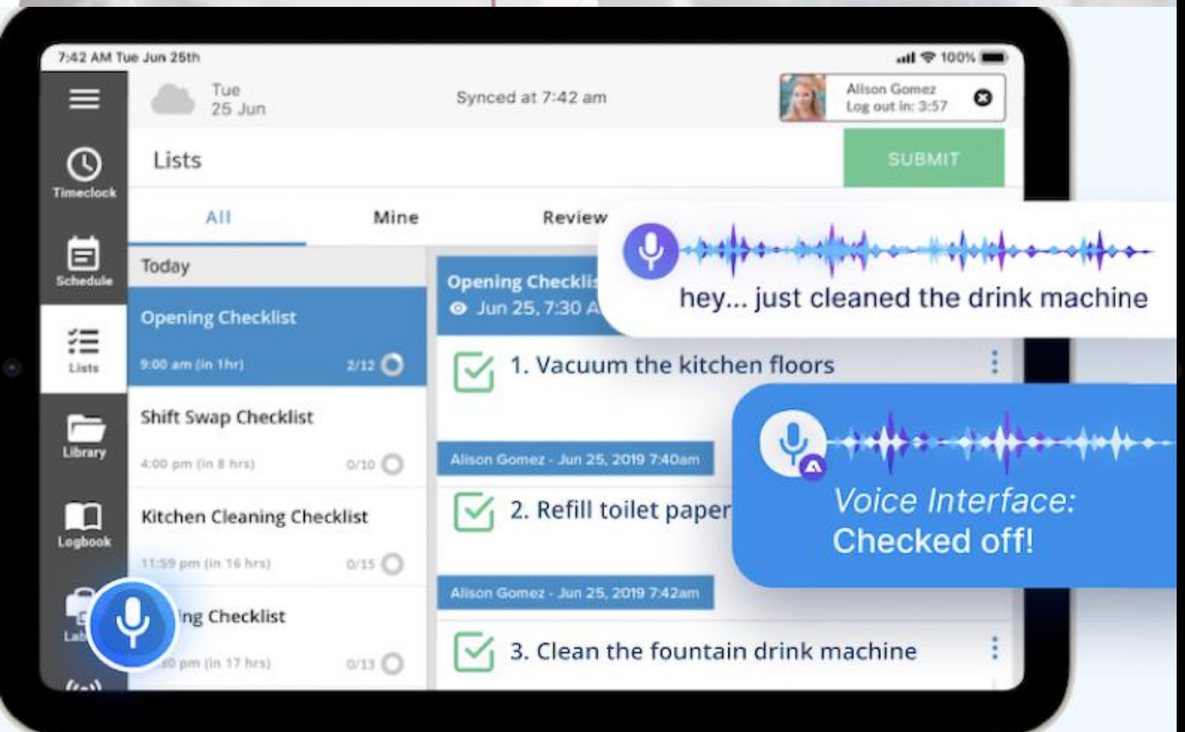
AI-based Voice Ordering System

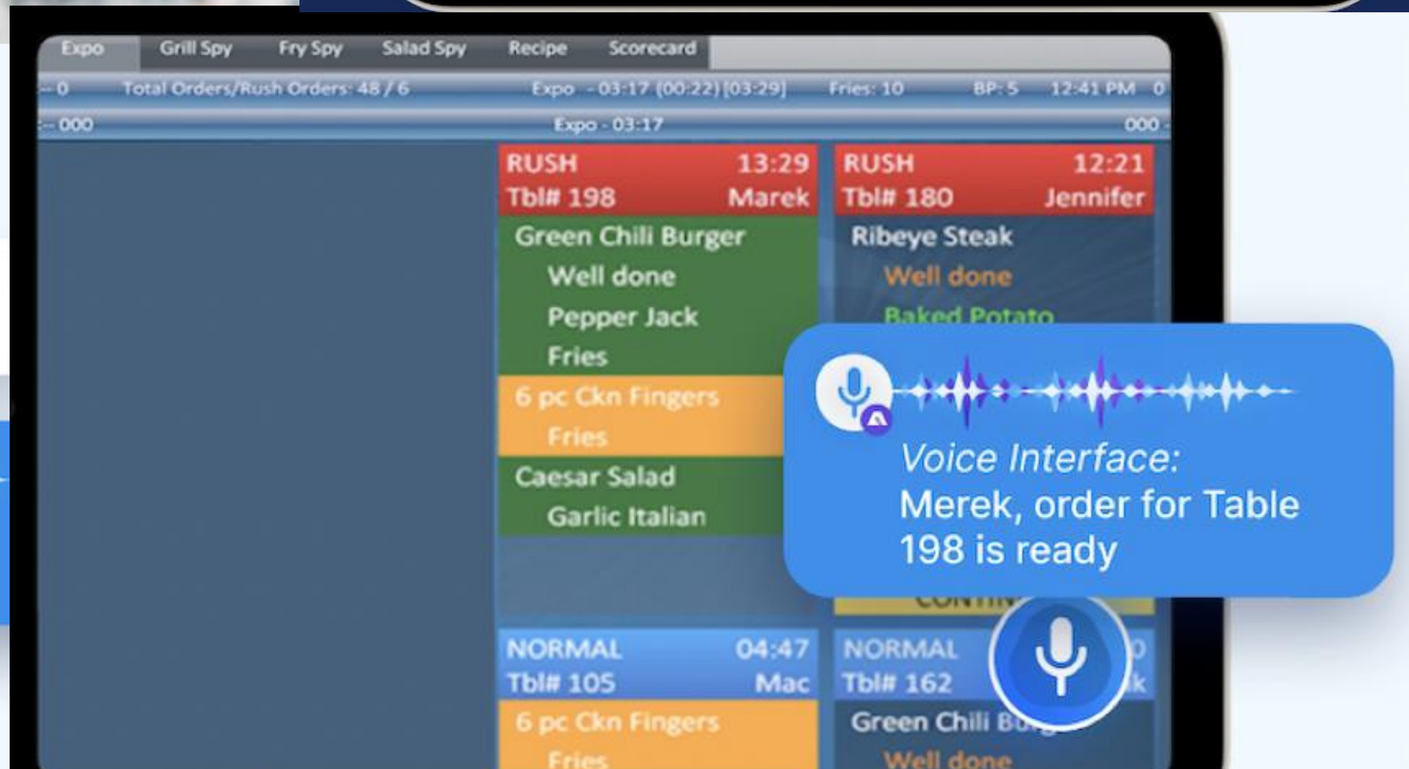
Converse Now

Wingstop partners with **ConverseNow** to use its “virtual ordering assistant”. The bot can take multiple phone orders at once, cutting down on hold times and dropped calls and freeing up employees.


Alan®
www.alan.app
Vacuum the kitchen floors checked
.. just cleaned the drink machine


Hey, Alan! Just checked temp in Hamburger Patty — now it is 158.4
SUBMIT
Review
Graphs
Manage
Schedule
Lists
Library
Logbook
Labels
Refrigerator temperature at 41°F
Disinfect all chopping boards
Hamburger Patty Temperature
Probe: Blue2 4B85623127
SELECT PROBE
158.4


7:42 AM Tue Jun 25th
Tue
25 Jun
Synced at 7:42 am
Alison Gomez
Log out in: 3:57
SUBMIT
Lists
All
Mine
Review
Timeclock
Schedule
Lists
Library
Logbook
Today
Opening Checklist
9:00 am (in 1hr)
2/12
Shift Swap Checklist
4:00 pm (in 8 hrs)
0/10
Kitchen Cleaning Checklist
11:59 pm (in 16 hrs)
0/15
0/13
Jun 25, 7:30 A
1. Vacuum the kitchen floors
Alison Gomez - Jun 25, 2019 7:40am
2. Refill toilet paper
Alison Gomez - Jun 25, 2019 7:42am
3. Clean the fountain drink machine
hey... just cleaned the drink machine
Voice Interface:
Checked off!


Expo
Grill Spy
Fry Spy
Salad Spy
Recipe
Scorecard
Total Orders/Rush Orders: 48 / 6
Expo - 03:17 (00:22) (03:29)
Fries: 10
BP: 5
12:41 PM
Expo - 03:17
RUSH 13:29
Tbl# 198 Marek
Green Chili Burger
Well done
Pepper Jack
Fries
6 pc Ckn Fingers
Fries
Caesar Salad
Garlic Italian
RUSH 12:21
Tbl# 180 Jennifer
Ribeye Steak
Well done
Baked Potato
NORMAL 04:47
Tbl# 105 Mac
6 pc Ckn Fingers
NORMAL
Tbl# 162
Green Chili
Voice Interface:
Merek, order for Table 198 is ready

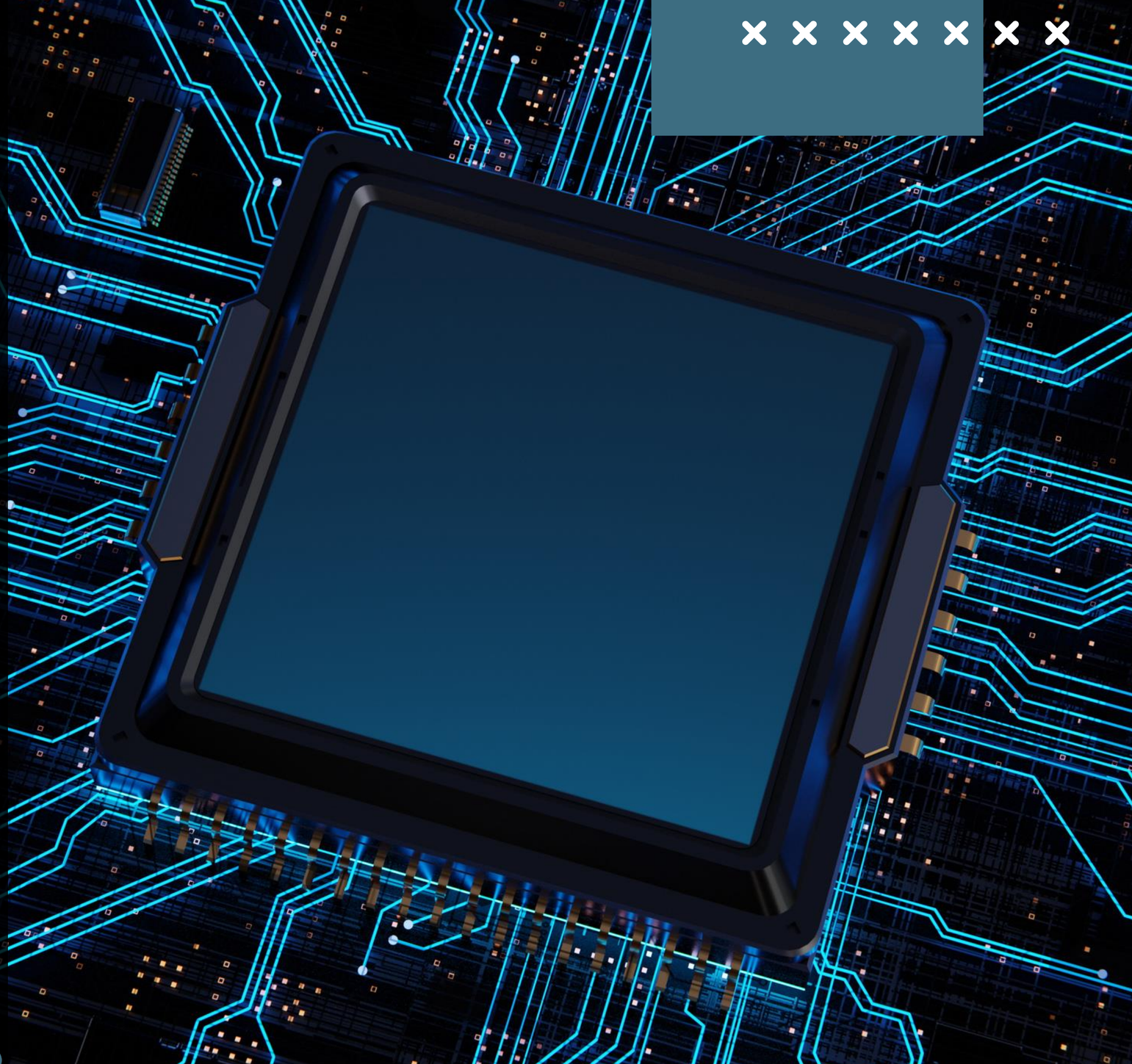
AI Phone Answering

Poppy's Pizza & Grill: in three months, Popmenu AI Answering fielded 3.6k calls for the restaurant (nearly 40 calls a day!) with 43% of calls tying to revenue activity.

Locals Pub & Pizzeria: online sales increased by 132% in their first 90 days with automated phone answering.

IMPLICATIONS TO SMART CAMPUS CATERING

How can AI Assistants be used in campus catering?



1. Menu Assistance and Dietary Information

• Personalised Recommendations: suggest meals based on individual dietary preferences, allergies, and nutritional goals (e.g., recommend vegetarian, vegan, gluten-free, or low-calorie options).

• Nutritional Information: provide detailed nutritional information for each menu item, helping students make informed food choices.

2. Ordering and Payment Processing

• Streamlined Ordering: take orders directly via mobile apps or websites, reducing wait times and streamlining the process; handle modifications, special instructions, and customisation of meals.

• Payment Integration: facilitate payment through various methods, including campus meal plans, credit/debit cards, and digital wallets.

3. Customer Support and Queries

- Real-Time Assistance: provide real-time responses to queries about menu items, opening hours, locations, and more; reduce the workload on human staff and ensure consistent communication.

- Feedback Collection: collect feedback from students, helping catering services to improve their offerings.

- Complaint Handling: log complaints, provide immediate responses, and escalate issues to human staff if necessary.

4. Promotions and Notifications

• Special Offers and Discounts: inform students about ongoing promotions, special menus, or discounts available in campus dining facilities.

• Event Announcements: notify students about special events, new menu launches, or changes in opening hours.

5. Operational Efficiency

• Inventory Management: By tracking orders and popular menu items, AI systems can assist in managing inventory, reducing waste, and ensuring the availability of ingredients.

• Analytics and Reporting: provide insights into customer preferences, peak times, and other data-driven insights to optimise operations.

Self-Service Technology (SST) – what has changed?

Service Quality

↓

~~Service Personnel~~

↓

Human – Computer Interaction (HCI)

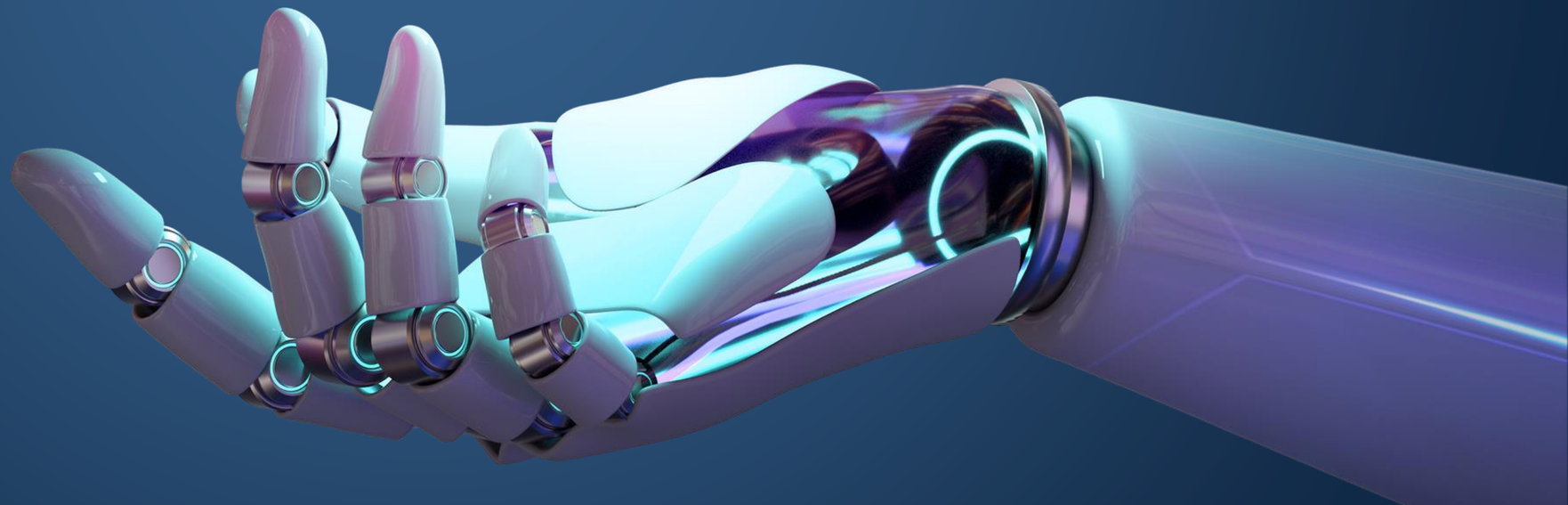
↓

User Experience (UX)

OPTIMISING INVENTORY MANAGEMENT

3

Reduce food waste



Winnow Solutions: track and reduce food waste. Their smart bins weigh and identify discarded items, providing real-time data and insights to chefs and managers, enabling them to make informed decisions about menu planning and portion control.

Too Good To Go: connects restaurants with customers looking to purchase surplus food at a discount, reducing food waste while also providing revenue for restaurants.

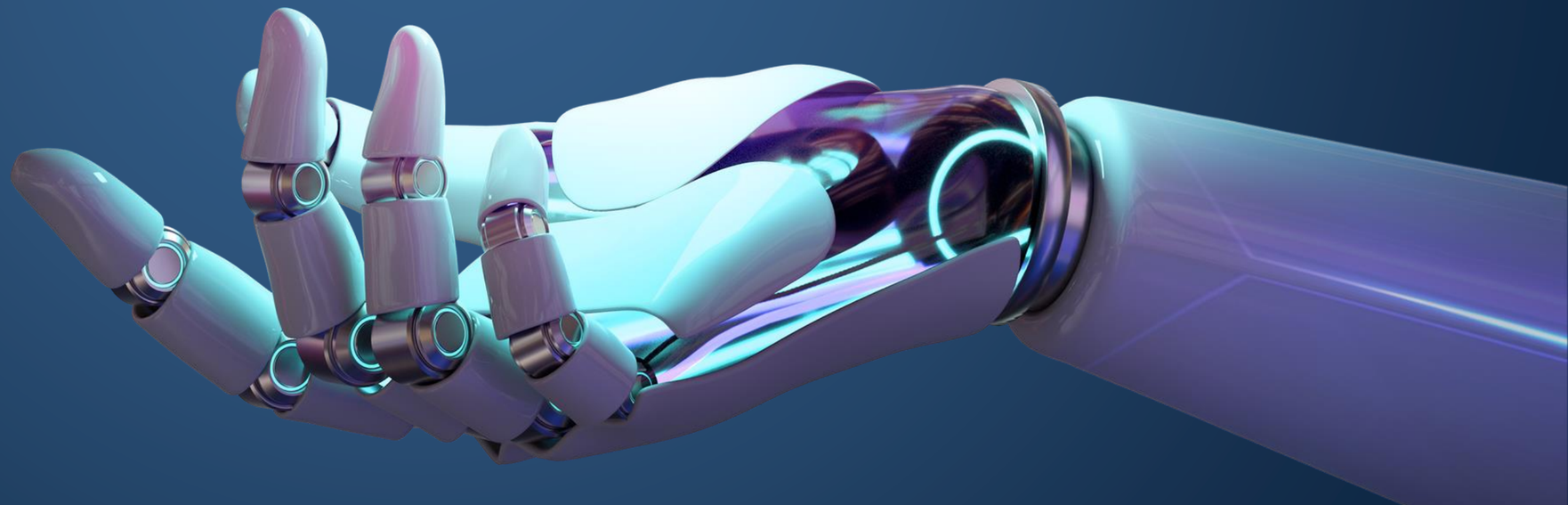
Rubicon: optimise waste and recycling processes, reducing unnecessary waste and diverting it from landfills.

This slide is a video, click the link below to view:

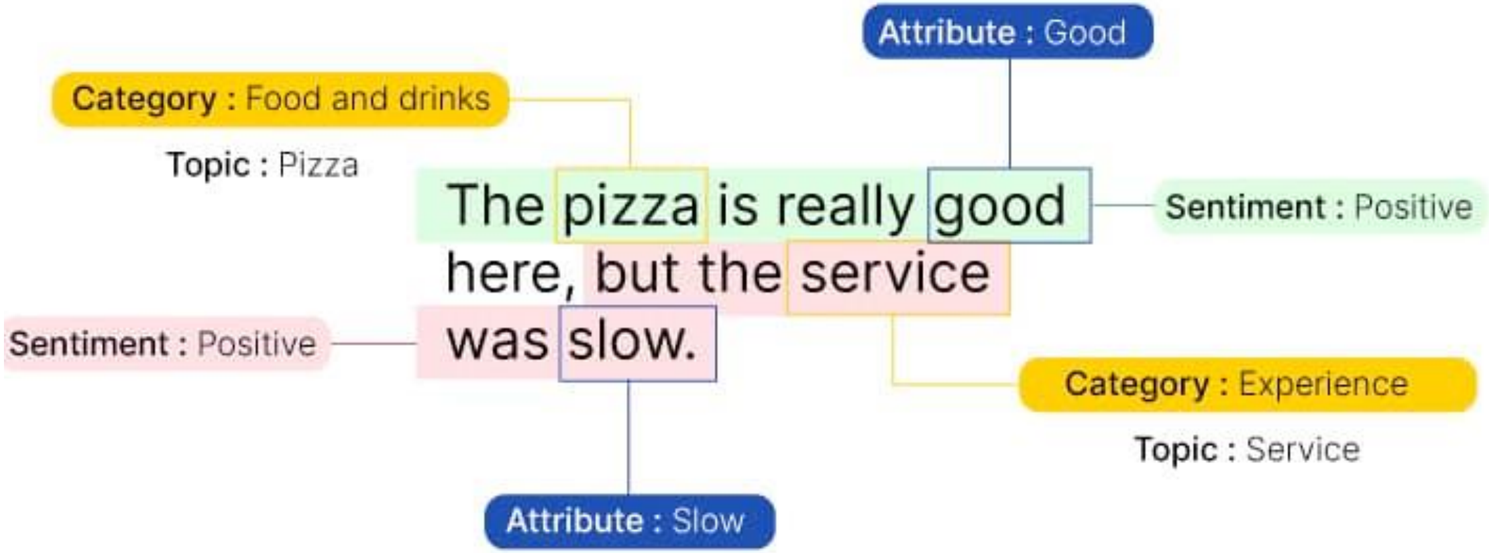
https://www.youtube.com/watch?v=SQ8CvT25_Dg

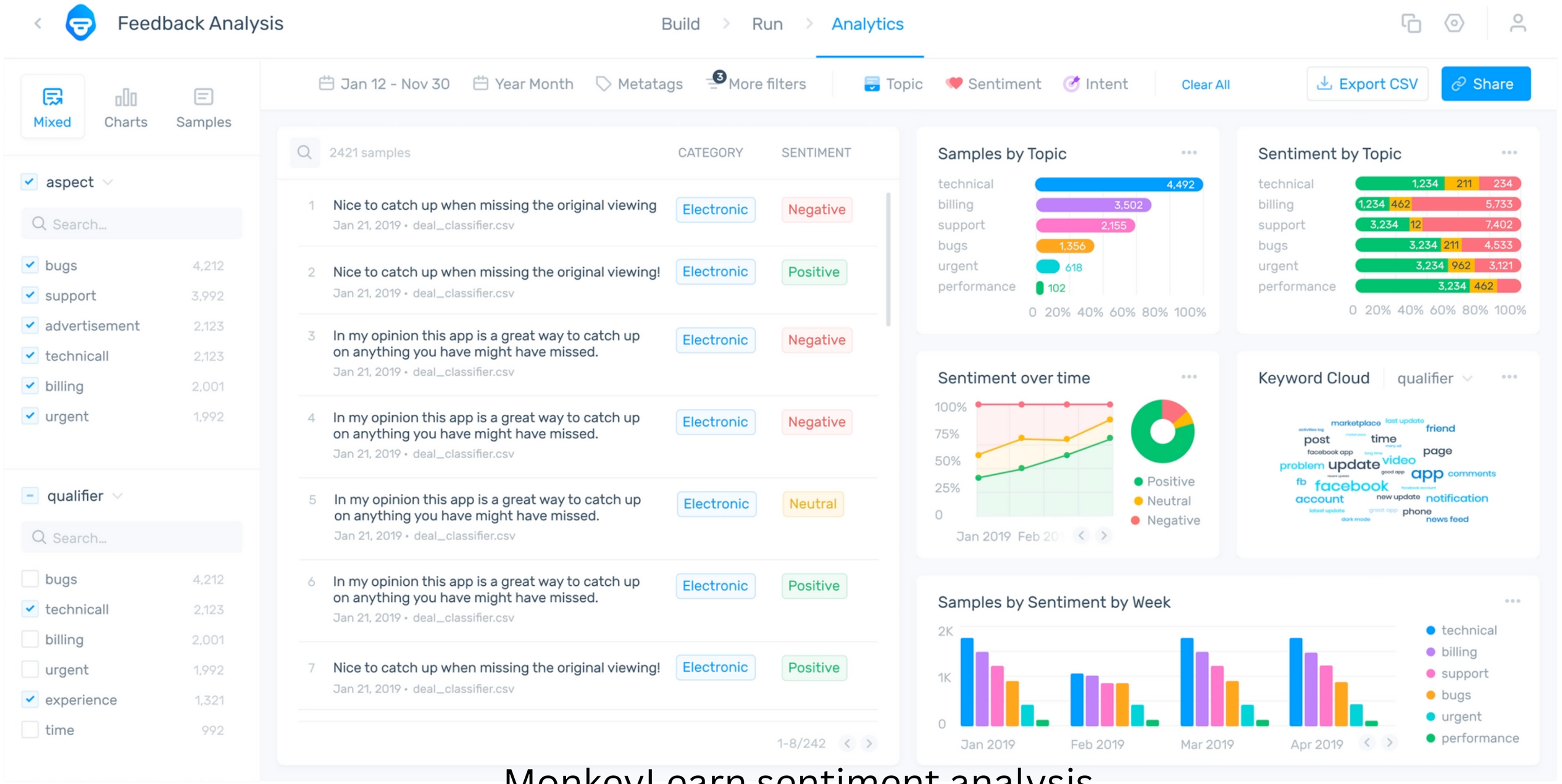
REAL-TIME FEEDBACK ANALYSIS

4



Analyse feedback to identify trends and improve services.

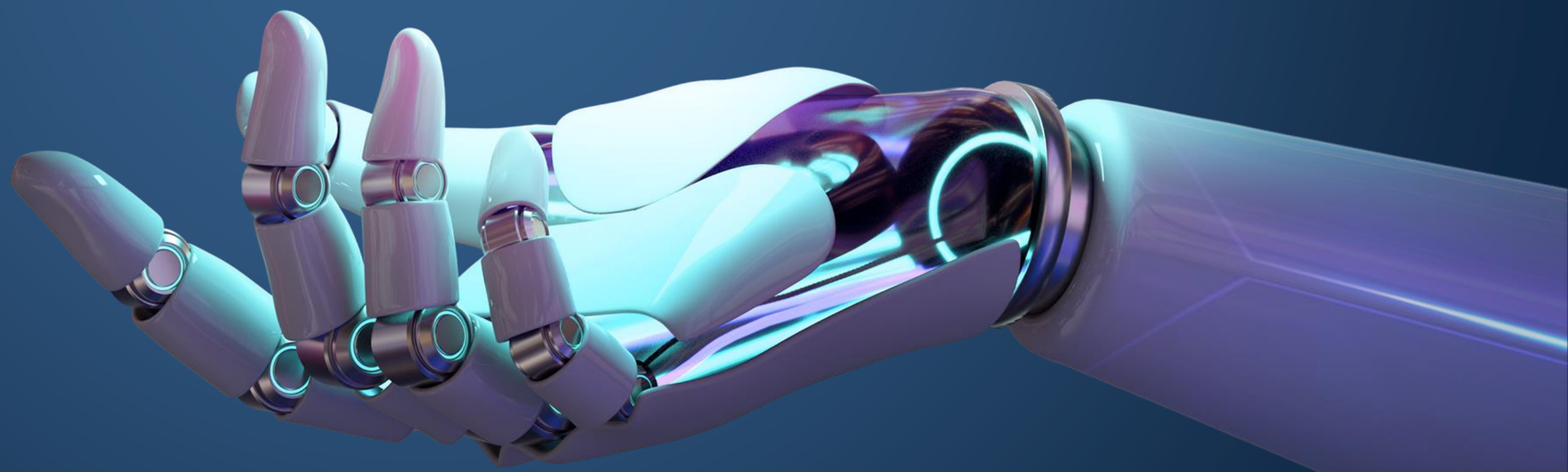




MonkeyLearn sentiment analysis

AI SELF-CHECKOUT

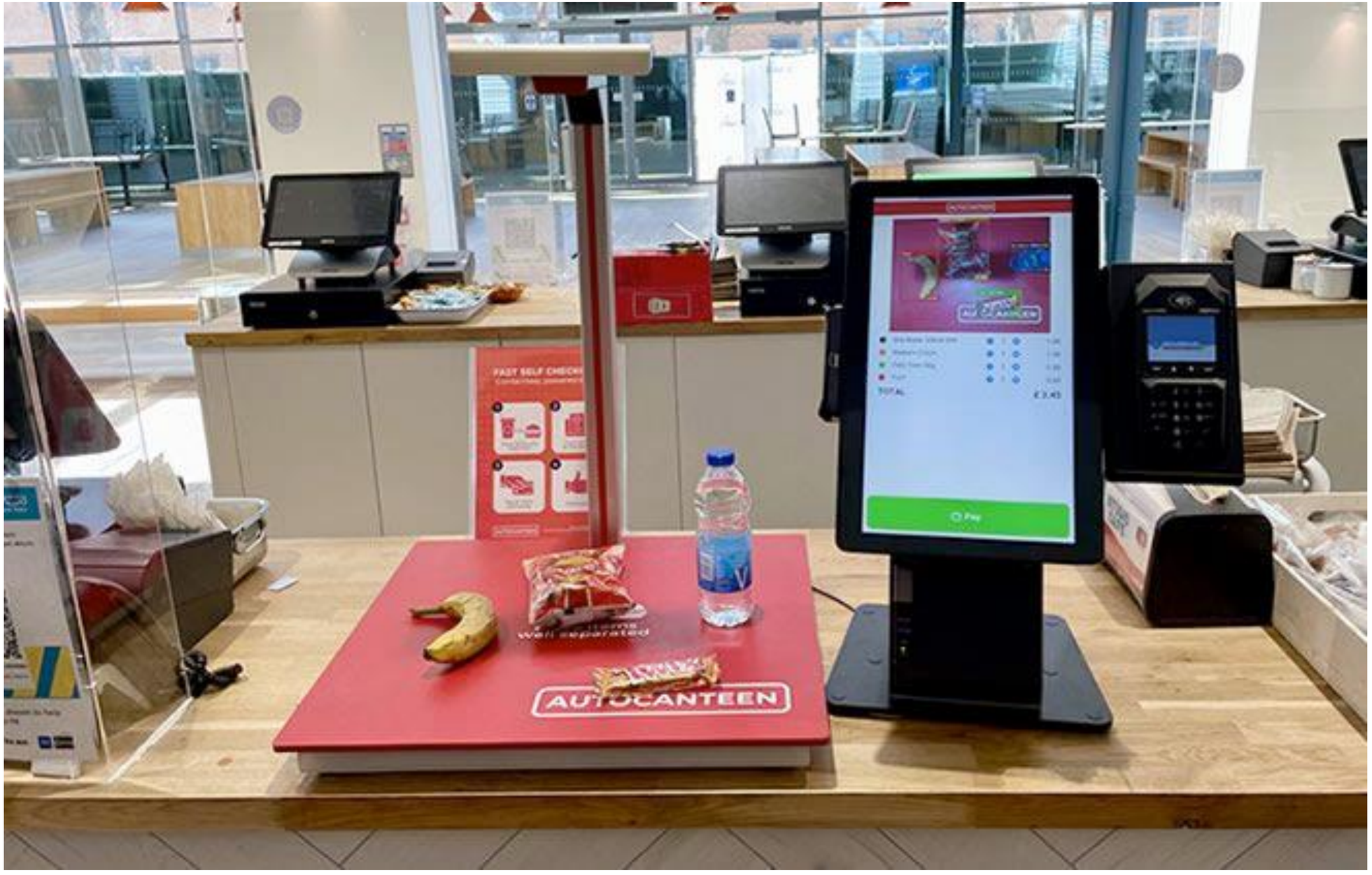
5



Lolly Snapserve, a vision-based cashier-less checkout that uses AI.

Snapserve uses computer vision and AI to speed up transactions, reduce queuing times (which aids social distancing) and improve hygiene, as touch screens and human contact are removed from the checkout process.

Sodexo deploys AI-enabled automated cafeteria management tool


AUTOCANTEEN

China's universities use big data from canteens to secretly sponsor poor students

PRIVACY

DIGNITY

"Recently we found that your campus card consumption was relatively low during your mealtime in the campus canteen, so we put 200 yuan (about £21.46) into your account. Hope it helps."

China University of Mining and Technology (CUMT), Xidian University, Nanjing University of Science and Technology, University of Science and Technology of China, and Zhengzhou University have all provided financial aid for poor students in similar ways

- Smart workforce management: optimising staff scheduling
- Predictive maintenance for kitchen equipment
- Data predictions: demand forecasting, dynamic pricing strategies
- Delivery processes: optimising delivery routes (e.g., Deliveroo, Uber Eats)
- Menu optimisation and personalisation
- Digital marketing strategies: generative AI content creation

Real-World Examples

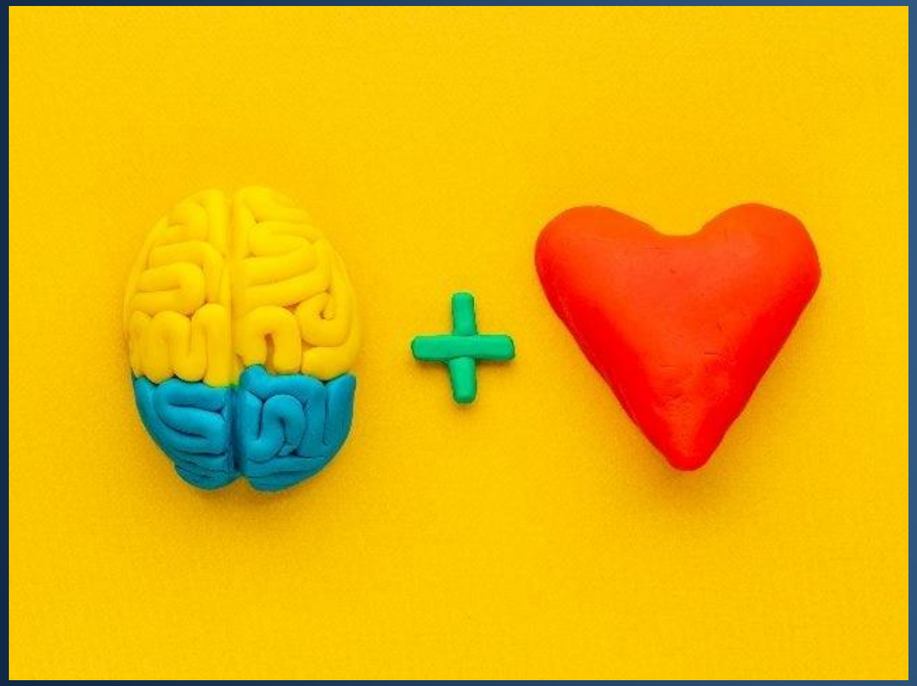
- **Apicbase**: monitors ingredient amounts in recipes or beverages, manages the scheduling of fresh deliveries, and automates recipe cost calculations.
- **Ottimate**: streamlines operations by autonomously extracting data from invoices and receipts, offering valuable insights, and facilitating vendor payments and invoice dispatch.
- **Tablein**: automates reservation process and offers analytics
- **MarketMan**: inventory management system
- **Wobot AI**: enhances businesses with its video intelligence solution, transforming standard security cameras into smart operational tools. Empowering businesses to oversee restaurant operations, streamline service workflows, monitor staff productivity, and manage incidents or tickets.
- **Lunchbox**: a digital ordering and order management system
- **Tidio**: provides AI-powered chatbot and live chat services tailored for businesses.

A HUMAN-AI PARTNERSHIP

The human is operating a control panel, while the robot is assembling a product

REQUIRING SOCIAL AND EMOTIONAL INTELLIGENCE

Empathy



Communication

Observation

LEADERSHIP ACTIONS

- Navigating AI with Judgment and Open Dialogue
- Set the Tone
- Encouraging Ethical AI Practices
- Model the Behaviours
- Embed in Operations with Supported Staff Training
- Protecting Student/Staff Data Privacy
- Promoting Transparency and Accountability

IT'S NOT A THREAT !

IT'S AN OPPORTUNITY !!

THANK YOU!

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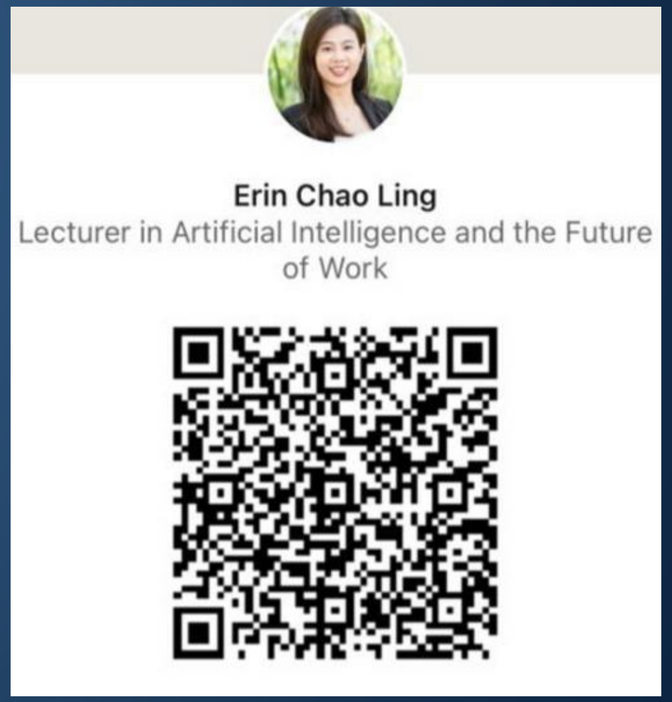
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