

Would the Robot Cheapen Your Croissant?

How robots impact brand, service, and quality perception

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¥ _____ served by a person

¥ _____ served by a robot

Buttered Byte



McGill



Why visible robot service matters



ROBOTS ARE ALREADY CUSTOMER-FACING

Coffee · hotel check-in · delivery · food retail [2, 13, 15, 16, 20]

THE VISIBILITY GAP

Much automation used in mass food production remains invisible to consumers.

OUR QUESTION

Does visible robot handling reduce the value of an otherwise artisanal product?

SMALL-BUSINESS STAKES

Food quality · service · brand and reputation

Five bets about service, teamwork, and product fit

SERVICE

H1

Human service will feel higher quality than robot service.

VISIBLE TEAM

H2a · H2b

Hybrid human-robot service will improve service quality (*H2a*) and brand experience (*H2b*), especially versus robot-only.

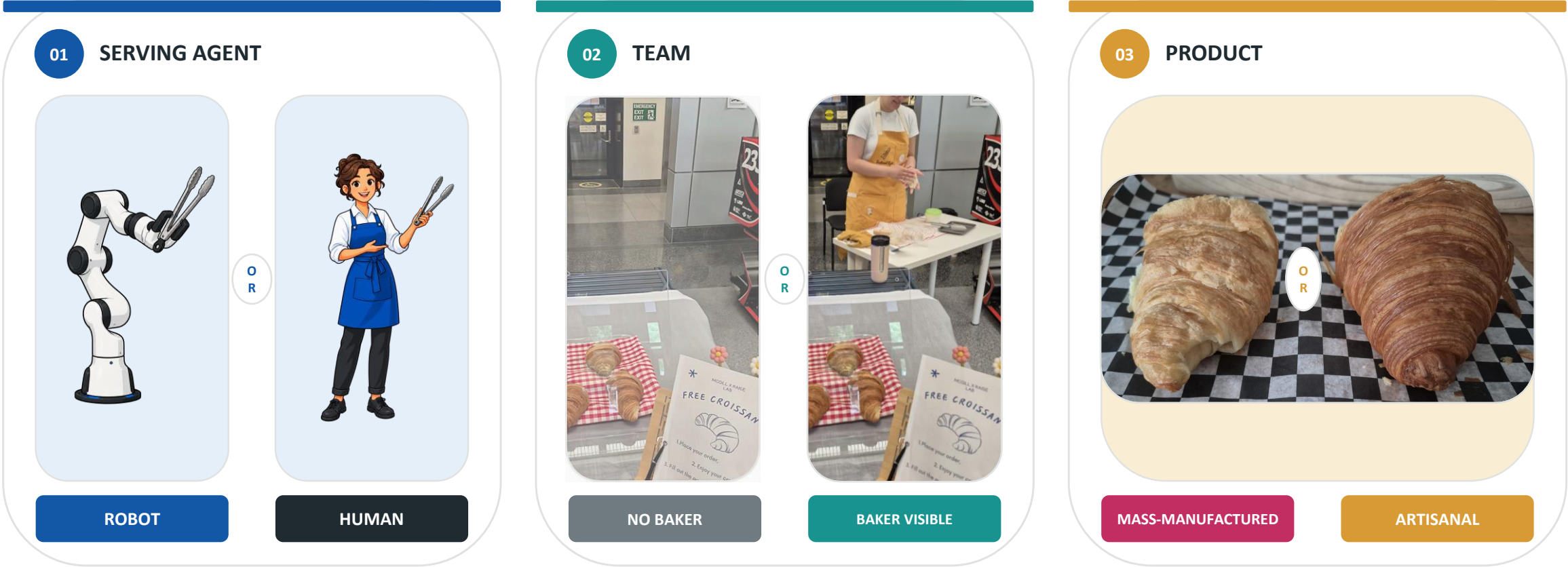
PRODUCT FIT

H3a · H3b

Artisanal will feel higher quality (*H3a*); robot service will hurt willingness to pay more for a mass-manufactured croissant (*H3b*).

Experience Economy framing: value lives in the experience - not only in the product or service.

Three levers created eight bakery scenes



2

×

2

×

2

=

8 CONDITIONS

The product cue was intentionally obvious



(LEFT) IN BOTH PHOTOS

MASS-MANUFACTURED

Large grocery brand

≈ ¥77

CAD \$0.67 acquisition price

(RIGHT) IN BOTH PHOTOS

ARTISANAL

2024 Montréal competition runner-up

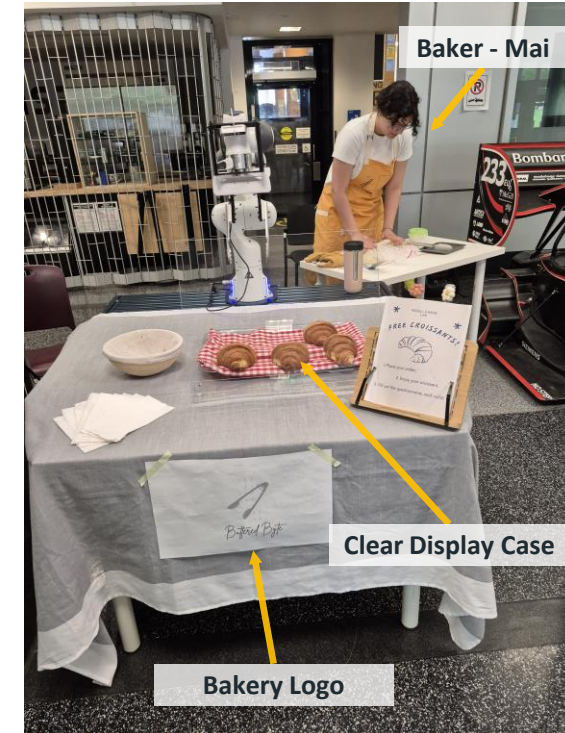
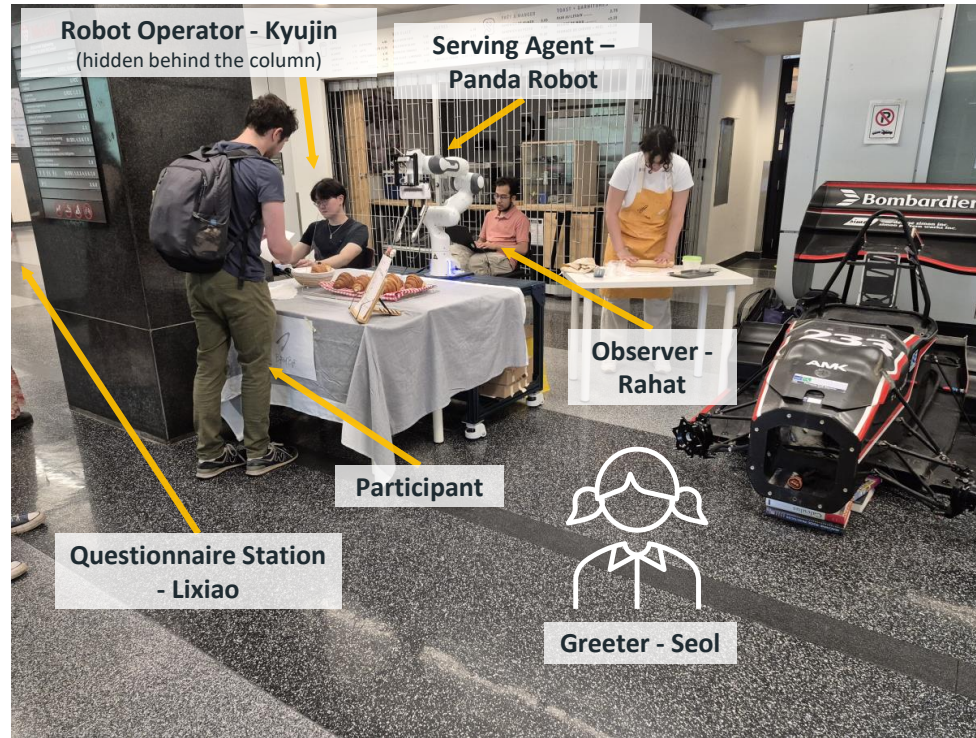
≈ ¥413

CAD \$3.60 acquisition price

Similar size · both baked that morning

JPY rounded using 1 CAD = ¥114.68 (Bank of Canada, 14 Aug 2026).

A real pop-up - not a lab vignette



1 INVITED
free croissant



2 ORDERED
human or robot



3 SERVED
tongs → basket



4 SURVEYED
optional questionnaire

7 days

50–60 croissants/session

324 completed questionnaires

The robot solved one visible task



1

SEE

Wrist RealSense + fine-tuned YOLO

2

ALIGN

Thresholding/SAM2 + PCA grasp angle

3

MOVE

Movelt: initial → pre-grasp → grasp

4

SERVE

Fixed transfer to the basket

Hidden operator heard the order and triggered motion.

WATCH THE HANDOFF

See → align → grasp → serve



LOOK FOR

- 1 APPROACH
- 2 ALIGN + GRASP
- 3 TRANSFER
- 4 RELEASE

2x speed · audio removed

Measures

SERVICE

Did the encounter feel competent, genuine, and worth repeating?

Excellence
Authenticity
Satisfaction

PRODUCT

Did the server change the thing it merely handed over?

Perceived quality
Willingness to pay

BRAND

Did one robot encounter spill over to the organization?

Attitude
Authenticity
Repurchase intention

Mostly 5-point ratings · Willingness to pay and Qualitative items were open text · N = 324

THE RESULT IN ONE SENTENCE

Customers evaluated
the whole scene.

HUMAN
WARMTH

PRODUCT
FIT

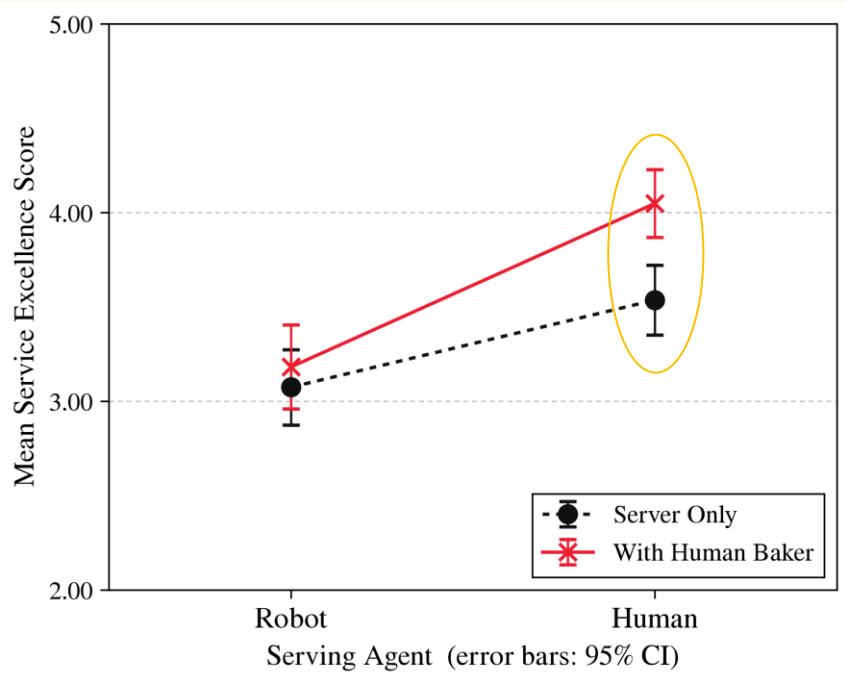
VISIBLE
CRAFT



Humans still owned the service layer

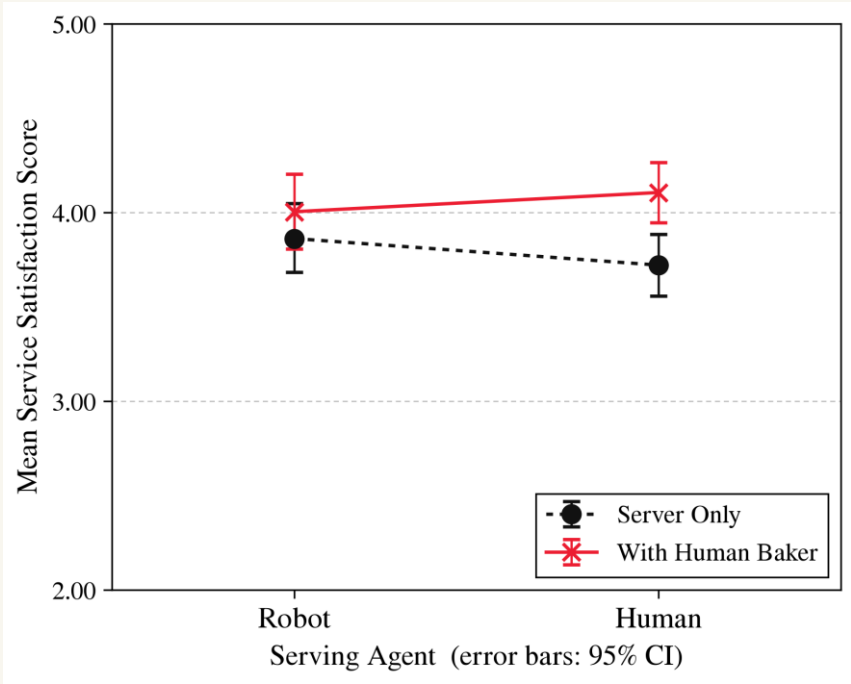
HUMAN SERVER ADVANTAGE → EXCELLENCE

SERVICE EXCELLENCE



VISIBLE BAKER → SATISFACTION

SERVICE SATISFACTION



H1 SUPPORTED

H2A PARTIAL

A visible baker added extra value

SERVER ONLY

≈ ¥360

CAD \$3.16



+ ≈ ¥44

+ VISIBLE BAKER

≈ ¥410

CAD \$3.54

Same croissant. Same serving agent.

The baker raised willingness to pay regardless of who held the tongs.



Brand attitude ↑

Brand authenticity ↑

Server identity itself did not significantly move either measure.

H2B SUPPORTED

JPY rounded at ¥114.68/CAD (Bank of Canada, 14 Aug 2026).

The robot amplified the weaker product signal



MASS-MANUFACTURED · (LEFT) IN PHOTOS

Robot service → lower perceived quality

A human server buffered the weaker product cue.

ARTISANAL · (RIGHT) IN PHOTOS

Quality held - human or robot server

The strong craft signal survived robot handling.

H3a supported · H3b partial

Hypothesis verdicts

H1

Human server → higher perceived service quality

SUPPORTED

H2a

Human–robot hybrid above robot-only but below human-only service

PARTIAL

H2b

Robot-as-sole-server lowers brand experience vs.
collaborative framing

SUPPORTED

H3a

Artisanal croissants perceived as higher quality

SUPPORTED

H3b

Robot hurts willingness to pay more for mass-manufactured
than artisanal

PARTIAL*

*H3b predicted a willingness-to-pay interaction; partial support came from the related perceived-quality interaction.

Fascination and enthusiasm toward the robot



POLITE, SOCIALLY NORMATIVE LANGUAGE

frequently using phrases such as “please”
and “may I.”

PATIENT, PLAYFUL, AND FORGIVING

several participants clapped or verbally
celebrated when the robot succeeded
after a failure.

20+

participants recorded videos of the
interaction with their phones

Participants ceased to view the encounter as social
and reframed it as a technical system breakdown.

Practical implications for service design and deployment strategies

VISIBLE HUMAN LABOUR

an important signal of craftsmanship associated with higher quality products

ASSISTING/ENABLING A PERSON

rather than deployed as full replacements for human workers.

SUPPORTIVE OR ASSISTIVE AGENTS

complement human labour while preserving the experiential value associated with human craftsmanship.

For lower-quality or mass-manufactured goods, robotic service may amplify perceptions of inferiority, whereas human service can partially mitigate this effect.

What this one pop-up cannot settle

1 One campus; mostly young

287 participants were under 35

2 Repeat exposure

Some people participated more than once;
may introduce order effects.

3 Team presence also changed headcount

The design cannot cleanly separate
collaboration framing from the number of
visible people.

4 One Panda arm; short encounter

Other robot forms, settings, and long-term
use may produce different expectations.

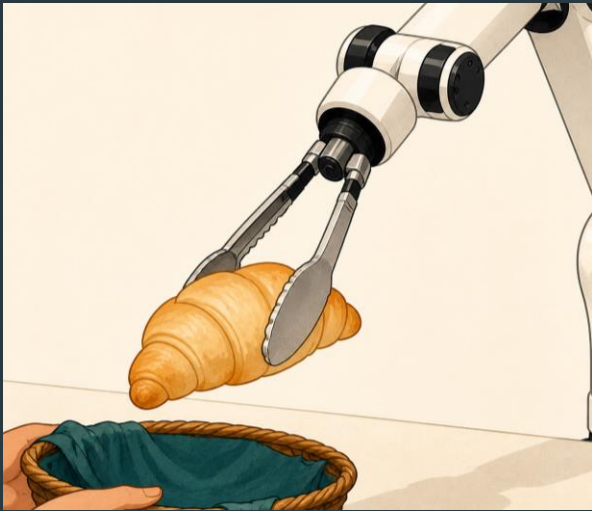
Next: balanced samples · repeated deployments · explicit team-framing controls · other robot morphologies

CONCLUSION

DID THE ROBOT CHEAPEN YOUR CROISSANT?

It depended on the product - and whether human craft stayed visible.

MASS-MANUFACTURED



YES - ON PERCEIVED QUALITY

Robot service amplified the weaker product signal.

ARTISANAL



NO - QUALITY STAYED HIGH

with either a human or robot server.

VISIBLE HUMAN CRAFT



THE BAKER LIFTED THE WHOLE EXPERIENCE

Better service, stronger brand experience, and higher willingness to pay.

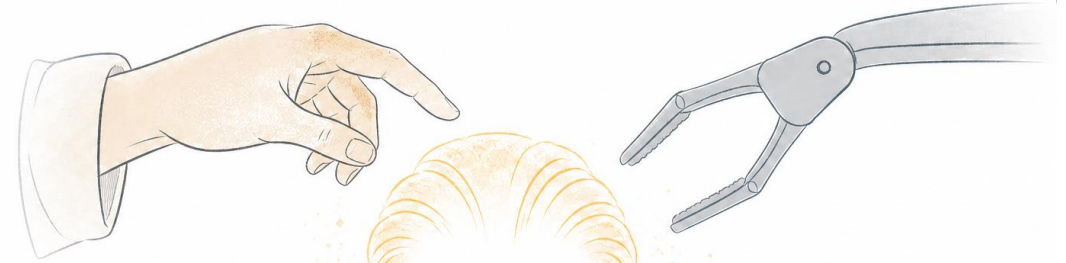
Use the robot to support the craft story - not replace it.

A robot can serve the product.

Visible people still craft the experience.

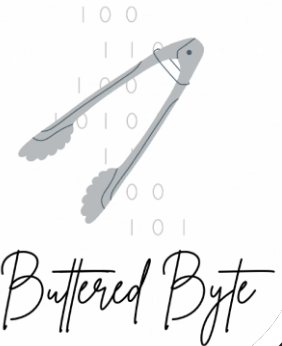
Thank you • Questions?

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“It is only with the heart
that one can see rightly;
what is essential is invisible
to the eye.”

— Antoine de Saint-Exupéry, *The Little Prince*



Natural Sciences and Engineering
Research Council of Canada

Conseil de recherches en sciences
naturelles et en génie du Canada

Canada



Sample and condition counts

N = 324

Planned minimum: 240

162 per croissant type

287 under age 35

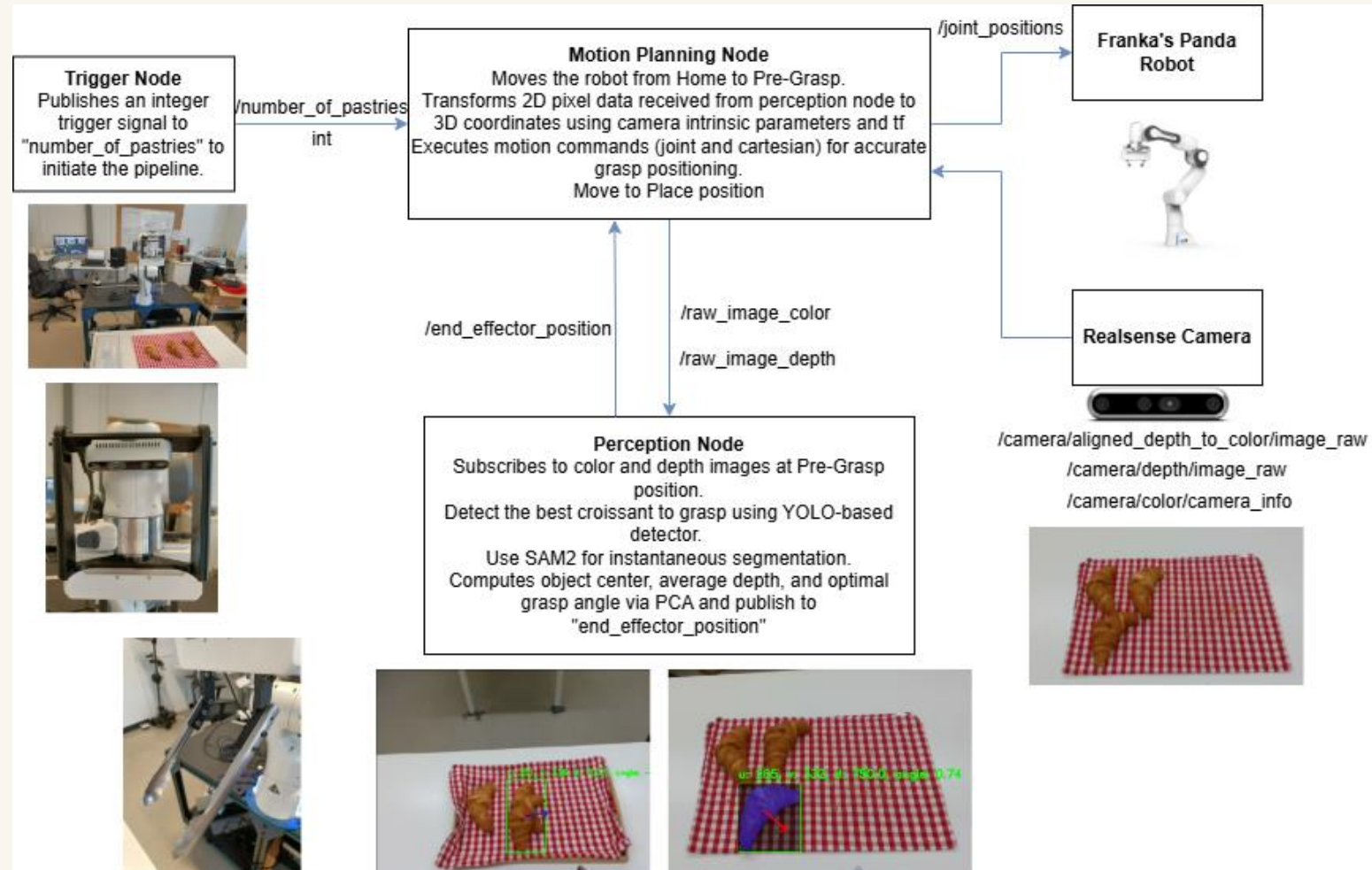
Reliability $\alpha \geq .70$ except
Service Authenticity: $\alpha = .67$

WTP: open-text stated maximum

Condition	Mass-manufactured	Artisanal	Total
Robot server only	34	46	80
Robot + visible baker	44	22	66
Human server only	40	45	85
Human + visible baker	44	49	93

Conditions generally ran on separate days; human + baker was the documented exception.

Robot system detail



Trigger

Hidden operator publishes pastry count

Perception

YOLO → thresholding/SAM2 → PCA

Planning

Movelt fixed pose sequence

Hardware

Panda + tongs + wrist RealSense

No autonomous speech recognition

Key statistical evidence

Measure	Comparison	Evidence	Interpretation
Service excellence	Serving Agent × Team interaction	$p < .05$	H1 supported; H2a partial
Service satisfaction	Visible baker: 4.07 vs 3.78	$p < .005$	Baker main effect
Brand attitude	Visible-baker main effect	$p < .05$	H2b supported
Brand authenticity	Visible-baker main effect	$p < .001$	H2b supported
Willingness to pay	CAD \$3.54 vs \$3.16 (+\$0.38)	$p < .05$	Baker effect; no agent effect
Perceived quality	Mass: robot 2.81 vs human 3.08	$p < .05$	Croissant × agent interaction
Repurchase intention	Artisanal: baker 3.89 vs alone 3.46	$p < .05$	Croissant × team interaction

Further reading

EXPERIENCE DESIGN

Pine, B. J., & Gilmore, J. H. (2011). The Experience Economy. Harvard Business Review Press.

ROBOT CAFÉS

Kamino, W., & Šabanović, S. (2023). Coffee, tea, robots? The performative staging of service robots in robot cafés. HRI.

HUMAN VS. ROBOT BARISTAS

Hwang, J., Choe, J. Y. J., Kim, H. M., & Kim, J. J. (2021). Human baristas and robot baristas. International Journal of Hospitality Management.

ROBOT ERROR

Mirnig, N., et al. (2017). To err is robot: How humans assess and act toward an erroneous social robot. Frontiers in Robotics and AI.

TRUST AND FAILURE

Salem, M., Lakatos, G., Amirabdollahian, F., & Dautenhahn, K. (2015). Would you trust a (faulty) robot? HRI.

Full IEEE reference list is in the paper; numbered brackets were removed from the live slides.