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Information and Communication Technology (ICT) as a driver of sustainable business models: **The moderating role of AI in retail.**

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Justification of the interest of the investigation

Why this topic matters

1

sustainability
pressure

2

technological
acceleration

3

AI entering customer
journeys

The research question is not whether ICT is useful, but how technology becomes part of a sustainable and value-creating business model.

Justification of the interest of the investigation

Research gap

We know these elements matter, but their combined role is still unclear.

- Sustainability and innovation are often studied separately.
- Sustainability innovation is still a relatively new construct in service research.
- ICT is widely adopted, but its role in sustainable innovation needs stronger empirical evidence.
- AI may change how customers perceive the value of ICT-enabled retail experiences.

Justification of the interest of the investigation

Purpose of the study

A customer-based view of technology, sustainable innovation and retail value.

We examine whether perceived technological advancement in retail stores drives Sustainability-Oriented Service Innovation (SOSI), and whether SOSI improves brand equity and satisfaction.

ICT as antecedent

SOSI as mechanism

Brand equity + satisfaction as outcomes

Additional question: does AI use moderate these relationships?

Key concepts

The model combines technological advancement with sustainability-oriented service innovation.



Development of the conceptual model and hypothesis formulation

Hypothesis 1:

The level of technological advancement (ICT) positively and significantly drives Sustainability-Oriented Service Innovation (SOSI).

Hypothesis 2:

Sustainability-Oriented Service Innovation has a positive and significant impact on brand equity.

Hypothesis 3:

Sustainability-Oriented Service Innovation has a positive and significant impact on customer satisfaction with the establishment..

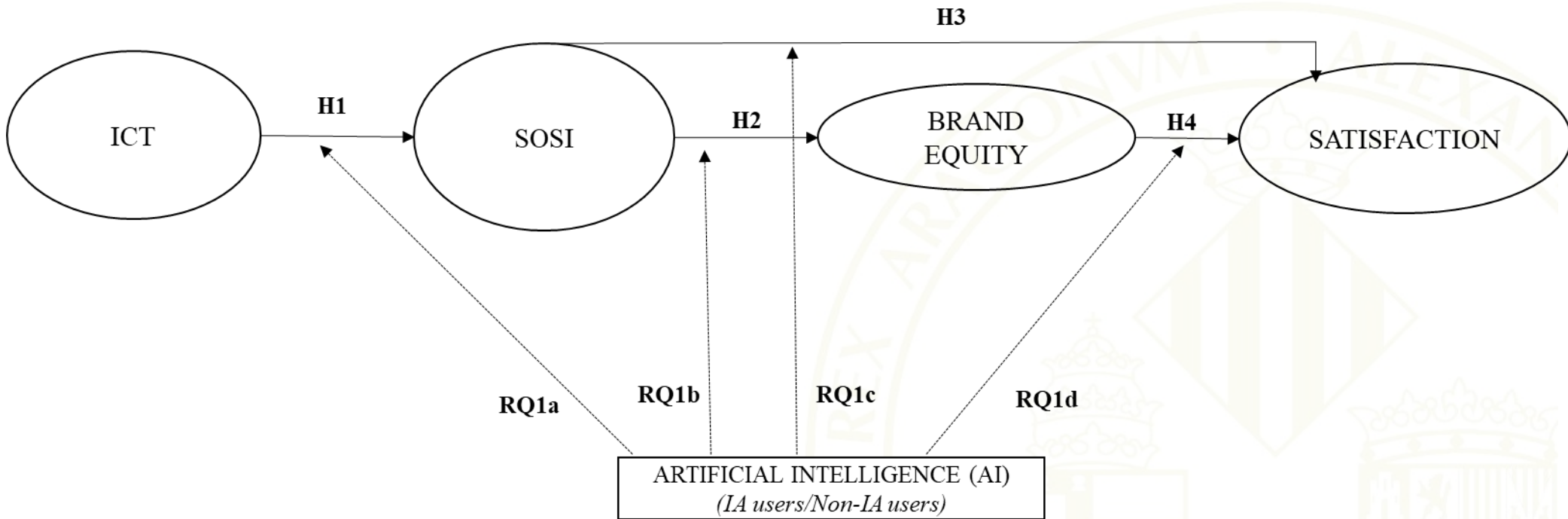
Hypothesis 4:

Customer perceptions of the retailer's store value have a positive and significant effect on consumer satisfaction with the establishment.

Research Question 1:

Are the relationships between ICT, SOSI, brand equity, and satisfaction (H1-H4) in retail moderated by AI?

Development of the conceptual model and hypothesis formulation



Methodology of empirical research

A quantitative study.

Research data sheet

Universe

Consumers of retail establishments

Geographical scope

Spain.

Methodology

Panel of consumers. Structured questionnaire

1,746
valid questionnaires

393
AI users

1,353
non-AI users

Information collection period

April-May 2025.

Statistical software

SmartPLS 4.0.

Measurement of the variables that make up the study model. Scales used

Reliability and convergent validity of the measuring instrument

Evaluation of the structural model

ICT

supported

4 items

SOSI

supported

29 items

Brand equity

supported

3 items

Satisfaction

supported

5 items

Quality checks passed

Reliability, composite reliability and AVE values were acceptable after removing weak items.

Evaluation of the instrument for measuring and constrating hypotheses

Reliability and convergent validity of the measuring instrument

Evaluation of the structural model

Main results

All direct relationships in the model are supported.

ICT → SOSI

supported

$$\beta = 0.739***$$

SOSI → Brand equity

supported

$$\beta = 0.587***$$

SOSI → Satisfaction

supported

$$\beta = 0.210***$$

Brand equity → Satisfaction

supported

$$\beta = 0.673***$$

Explained variance: SOSI $R^2 = 0.547$ · Brand equity $R^2 = 0.344$ · Satisfaction $R^2 = 0.663$

Evaluation of the instrument for measuring and constrating hypotheses

Reliability and convergent validity of the measuring instrument

Evaluation of the structural model

What changes when AI use is considered?

AI helps us understand heterogeneity in customer responses.

ICT → SOSI

AI users: $\beta = 0.658^{***}$

Non-AI users: $\beta = 0.750^{***}$

Other paths are highly similar across groups:

- SOSI → Brand equity: 0.572 vs. 0.584
- SOSI → Satisfaction: 0.185 vs. 0.216
- Brand equity → Satisfaction: 0.662 vs. 0.675

Practical reading: AI does not replace sustainable innovation. It changes how technology is experienced by consumers.

The strongest route to satisfaction is not direct technology use, but the value created when technology supports sustainable innovation and strengthens the brand.

Implications for retail managers

Technology should be integrated into a broader responsible innovation strategy.

- Move beyond technology as a purely operational tool.
- Use ICT to support sustainable practices, responsible processes and better customer relationships.
- Strengthen brand equity as a pathway to satisfaction.
- Adapt AI-based technologies to customers' familiarity, trust and perceived usefulness.

Broader contribution

A retail study with relevance for sustainable innovation ecosystems.

Sustainable business models are not created by technology alone.

They emerge when technological capabilities, sustainability-oriented innovation and customer perceptions are aligned.

Responsible innovation

Digital transformation

Customer value

Limitations

- Limited view of SOSI research in the retail sector.
- Lack of understanding of the consequences and effects of SOSI.
- Single-method bias.
- Limited consideration of other relevant variables that influence customer behavior.
- Limited view of AI.



Future Research Lines

- Advance the study of SOSI in different contexts.
- Analyze SOSI through other variables.
- Combine different research techniques.
- Incorporate additional variables (e.g., trust, engagement, loyalty).
- Expand this approach by incorporating other AI applications (e.g., recommendation systems, predictive analytics, or computer vision).



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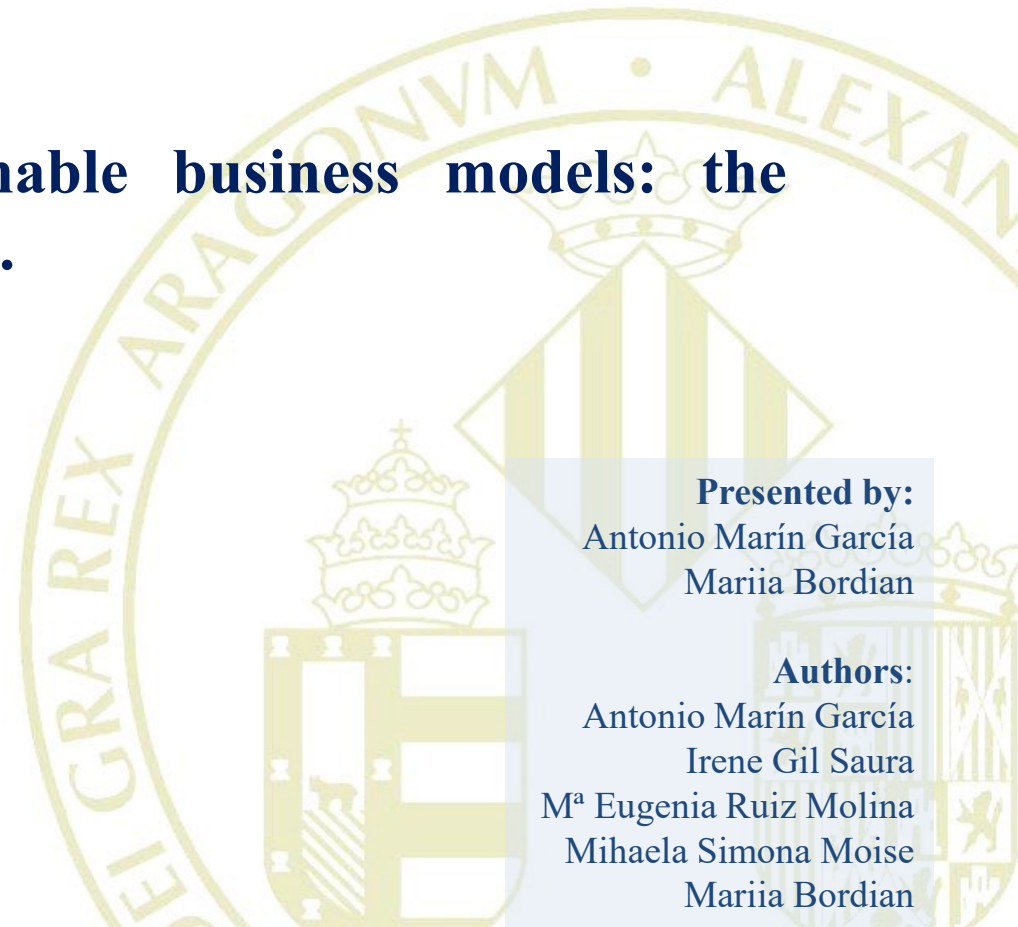
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Thank you for your attention!

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Evaluation of the instrument for measuring and constrating hypotheses

Backup: detailed coefficients

	Causal relationship	Hypothesis	Standardized beta	t
H1	ICT → SOSI	Supported	0.739***	61.458
H2	SOSI → Brand equity	Supported	0.587***	30.375
H3	SOSI → Satisfaction	Supported	0.210***	9.202
H4	Brand equity → Satisfaction	Supported	0.673***	31.020

SOSI: R²= 0.547, Q²=0.546; Brand equity: R²=0.344, Q²=0.312; Satisfaction: R²=0.663, Q²=0.290
 Statistically significant at ***p<0.01

Research Question	Causal relationship	With AI N=393		Without AI N=1353		p-value
		Standardized beta	t	Standardized beta	t	
RQ1a	ICT → SOSI	0.658***	21.943	0.750***	57.460	0.658***
RQ1b	SOSI → Brand equity	0.572***	13.693	0.584***	26.534	0.572ns
RQ1c	SOSI → Satisfaction	0.185***	4.489	0.216***	8.219	0.185ns
RQ1d	Brand equity → Satisfaction	0.662***	15.955	0.675***	27.214	0.662ns

*Statistically significant at ***p<0.001; ns = statistically non-significant.*