Are Retailers Ready for implementing Blockchain Traceability Systems in the Honey Supply Chain ?

Erraach Y., Mlayeh T., Ouertani E., Arfa, L., Kallas, Z., Ennahli, S., Mutlu Çamoğlu S., ,Di Magistris, T.

Project Engineer: Taheni Mlayeh

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Study Background

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Trust has become one of the most valuable and most fragile currencies in food markets today. In the case of honey, it's already breaking!

The honey markets in the Mediterranean are full of fraud and label problems, but blockchain can help. It tries to make honey retailers, honey producers and consumers trust each other again and be open with each other.

Problem statement and objectives

- This study investigates what makes honey retailers adopt blockchain across ***Spain, Tunisia, Morocco, and Turkey***.

- To identify behavioral and structural **predictors of blockchain adoption willingness** among honey retailers in four Mediterranean countries.

- Understanding their **motivations** **and** **barriers** is essential for scaling BCT solutions in agri-food sectors.

Research Design and Methods

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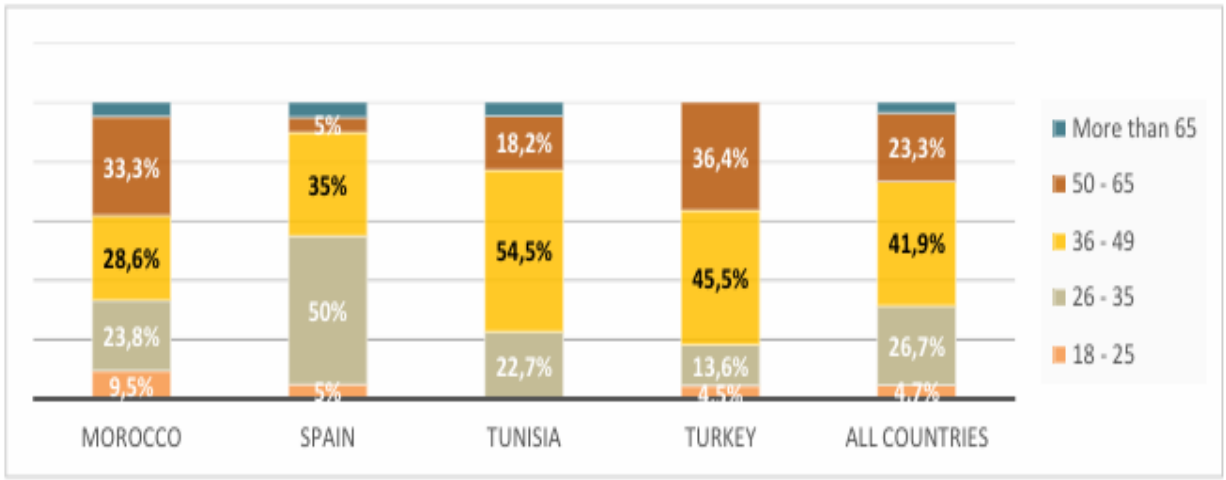
Study Design:

- Sample: **86 retailers** from Morocco, Spain, Tunisia, and Turkey.
- Frameworks: Theory of Planned Behavior **(TPB)** and Technology Acceptance Model **(TAM)**
- Tools: Descriptive stats, **Regression** analysis

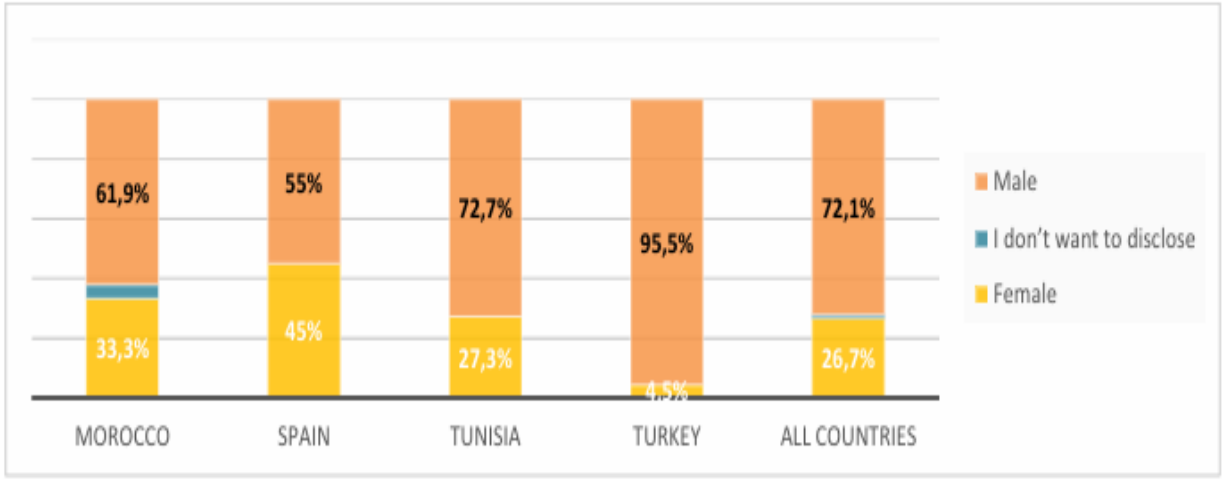
Key Variables:

- ✓ Intention to adopt BCT by honey retailers
- ✓ Perceived usefulness, social, environmental/economic factors
- ✓ Subjective norms, attitudes, education level

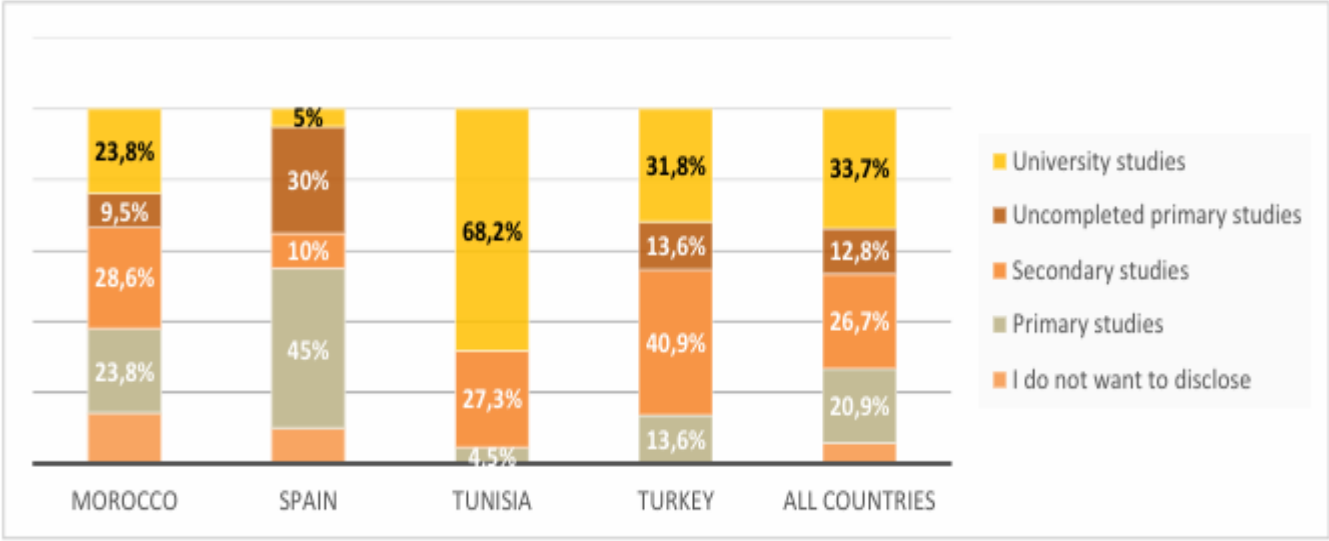
Key Findings : Descriptive Overview Dashboard :Blockchain Adoption in Honey Retail: Insights from the Mediterranean



Retailers age distribution



Retailers gender distribution



Retailers' educational level

Key Findings : Blockchain Adoption in Honey Retail, Insights from the Mediterranean

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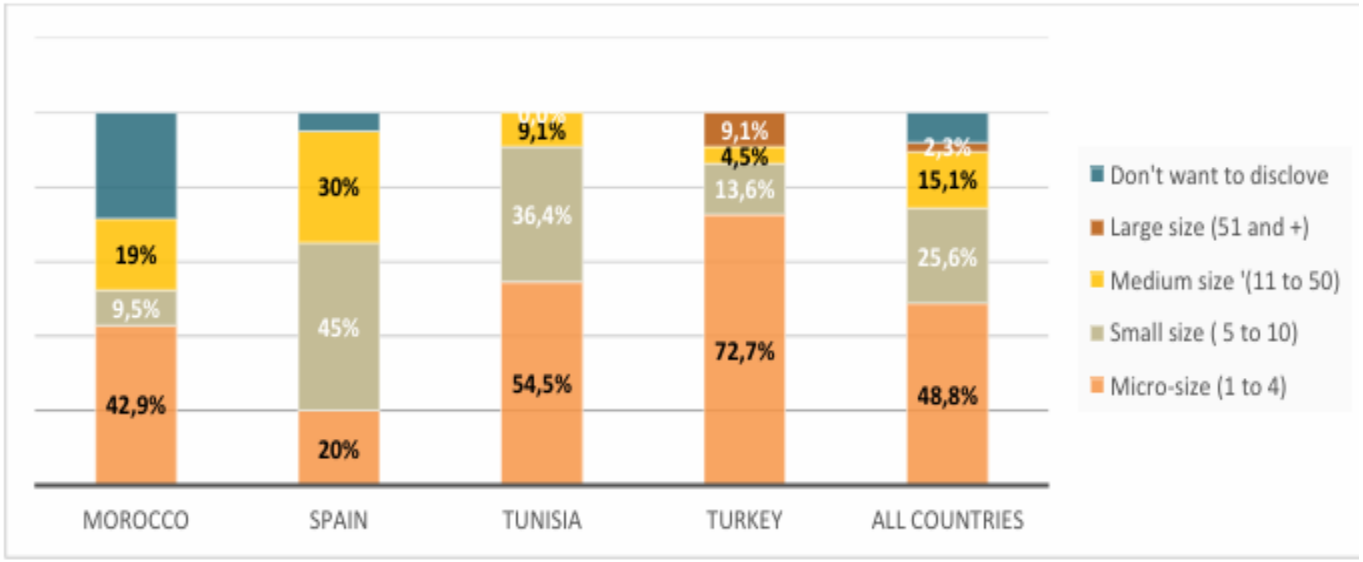
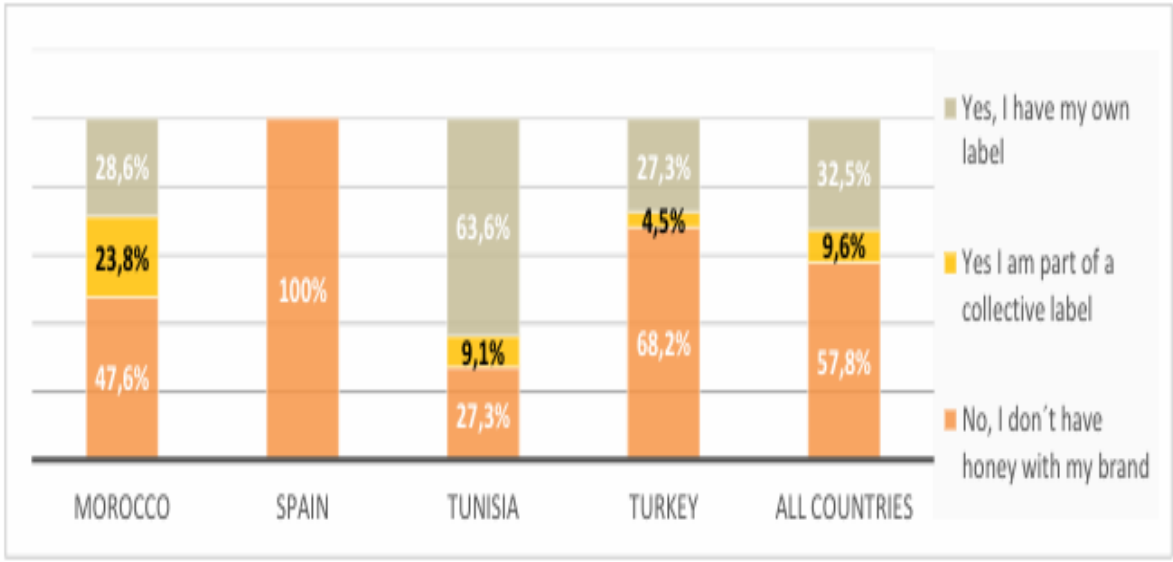
- ✓ The majority of retailers (41.9%) fall within the 36–49 age range, suggesting a relatively mature workforce potentially open to innovation though digital readiness may still vary.

- ✓ The sector is predominantly male-dominated (72.1%),raising questions about inclusiveness and digital training targeting.

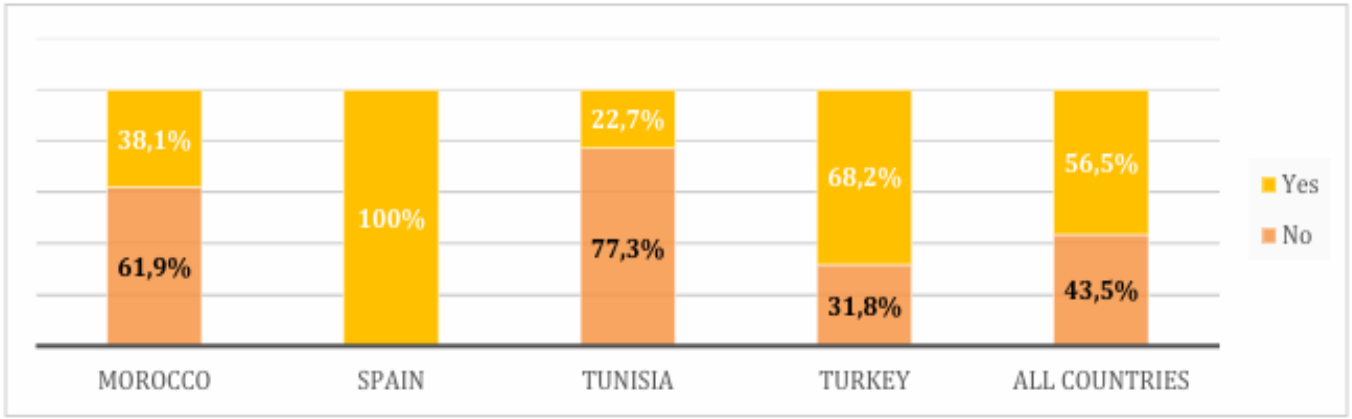
- ✓ Retailers with university education represent 33.7% of the sample, with significant variation between countries (just 5% in Spain vs. 68.2% in Tunisia)



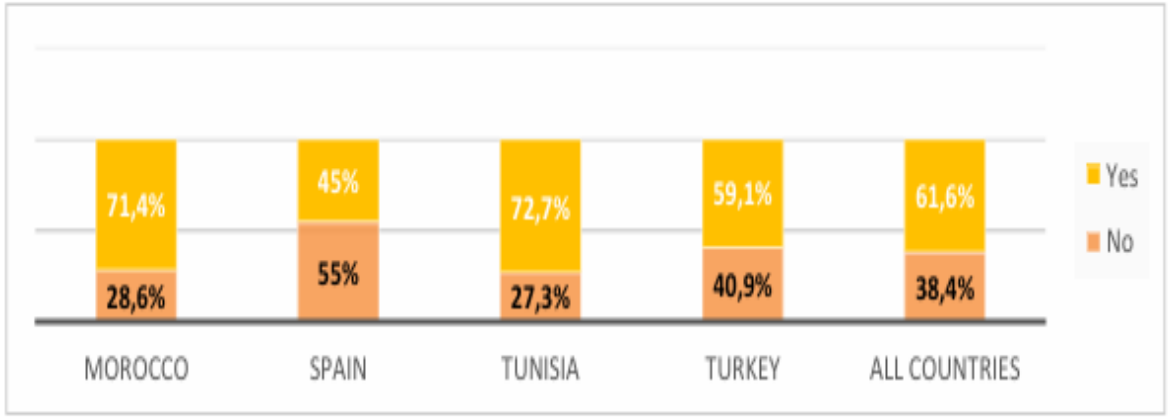
Retailers' size.



Label and brand of honey used by retailers



Percentage of retailers selling certified honey



Retailers' contacts with fraudulent honey

Key Findings : Blockchain Adoption in Honey Retail, Insights from the Mediterranean

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- ✓ Across Explanatory study countries, micro-enterprises (1–4 employees) dominate the honey retail sector, comprising 48.8% of the sample with notable prevalence in Turkey (72.7%) and Tunisia (54.5%).
- ✓ Over 57.6% of retailers operate without any brand labeling, highlighting a critical gap in traceability and product differentiation, particularly in Morocco and Turkey.
- ✓ Only 56.5% of retailers across the sample report selling certified honey, with Spain being the sole country at full compliance (100%), in contrast to notably lower figures in Tunisia (22.7%).
- ✓ A 61.6% of respondents reported contact with fraudulent honey, but they don't adopt preventive measures,

  => behavioral gap between awareness and action.

Key Findings : Blockchain Adoption in Honey Retail, Insights from the Mediterranean

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⇒ Despite 61.6% of retailers reporting experiences with fraudulent honey, only 18.6% demonstrated awareness of BCT solutions.

⇒ Technological awareness (BCT) and problem-solving behavior remain critically underdeveloped

⇒ This gap presents a strategic opportunity: advancing BCT not only as a digital tool but as a trust-building infrastructure in food systems

Key Findings : Regression Model of adoption intention

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Model Summary - Intention_AdoptBCT

Model	R	R^2	Adjusted R^2	RMSE	Durbin-Watson Autocorrelation	Durbin-Watson Statistic	Durbin-Watson p
H_0	0.000	0.000	0.000	1.015	0.264	1.454	0.013
H_1	0.662	0.438	0.336	0.828	0.212	1.554	0.032

Model		Unstandardized	Standard Error	Standardized[a]	t	p	Collinearity Statistics Tolerance	Collinearity Statistics VIF
H_0	(Intercept)	0.020	0.114		0.179	0.859		
H_1	(Intercept)	0.683	0.457		1.494	0.140		
	Effort_expectancy	0.337	0.102	0.334	3.304	0.002	0.834	1.199
	Social_Factor	-0.350	0.175	-0.342	-2.004	0.049	0.292	3.425
	Envir_Factor	0.584	0.194	0.575	3.008	0.004	0.233	4.292
	Eco_Factor	0.378	0.225	0.379	1.683	0.097	0.168	5.970
	Attitudes_BCT	0.092	0.173	0.091	0.533	0.596	0.293	3.416
	Perceived_Beh_control	0.272	0.109	0.273	2.491	0.015	0.711	1.407
	Perc_investementBCT	-0.187	0.111	-0.188	-1.686	0.096	0.685	1.459
	Perc_Usefulness_BCT	0.167	0.170	0.166	0.985	0.328	0.299	3.347
	Subjective_Norms	-0.059	0.150	-0.057	-0.392	0.696	0.397	2.521
	REGULATIONS	-0.146	0.128	-0.143	-1.146	0.256	0.544	1.838
	Percv_Ease_useBCT	-0.208	0.155	-0.209	-1.342	0.184	0.353	2.835
	University-studies (University studies)	-0.537	0.216		-2.480	0.016	0.809	1.236

ardized coefficients can only be computed for continuous predictors.

Key Predictors: What Predicts Blockchain Adoption?

✓Perceived Behavioral Control & attitudes
✓Effort Expectancy
✓Economic , Environmental factors

→ Positive Influence

x Investment Cost Concerns
x University education level
x Social factor

→ Negative Influence

- Attitudes , Subjective Norms & regulations → Not significant

Education vs. Adoption willingness

Retailers with higher education were less likely to adopt blockchain.
Why?
Our hypothesis:

- ❑ **Data confidentiality concerns**
- ❑ **Risk aversion due to irreversible transactions**
- ❑ **Critical thinking leads to hesitation, not action**

→ Higher education was associated with lower willingness to adopt BCT, revealing a more complex relationship between knowledge and perceived technology value.

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Policy & Practice and Research Recommendations

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Policy & Practice

Awareness campaigns

Cost-sharing or cooperatives

Tailored training for small retailers

Future Research

Conduct longitudinal studies _Follow-up behavior tracking

Trust transfer mechanisms

Develop user-friendly BCT interfaces

Q/A

Thank you!

Let’s invest in trust, tech-tools, and clear gains!

mlayehtahani@gmail.com