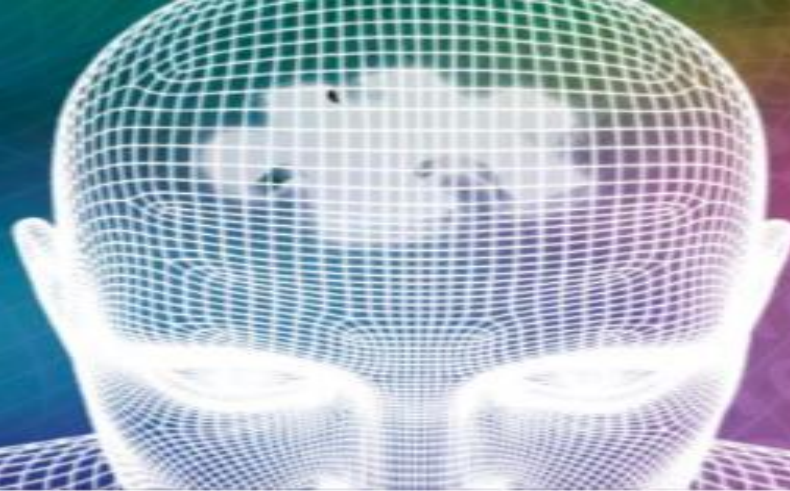


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Fuzzy cognitive maps: An application to the analysis of purchase intention for touristic products in a social media context

Tomás Escobar, María Asunción Grávalos and Cinta Pérez



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This study analyses the effect of the users' personal characteristics in their intention to purchase touristic products in a social media context, differentiating between early and late adopters.



Structure of the exposition

1. INTRODUCTION AND BACKGROUND
2. OBJECTIVES
3. METHODOLOGY
4. RESULTS
5. CONCLUSIONS
6. LIMITATIONS AND FUTURE WORKS



Introduction and background

Social media has deeply transformed the manner in which people access information, plan for, consume travel and consequently share their travel experiences (Chung & Buhalis, 2008; Buhalis & Law, 2008; Hays, Page & Buhalis, 2013; Xiang & Gretzel, 2010).

There is not enough literature examining the factors that have an influence on the attitude of users of social media to the use these networks to plan their trip, based on the opinion of the experts.



Introduction and background

Conceptual framework

Innovation is the degree to which a person is relatively early in adopting new ideas compared to other members of a system.

THE INNOVATIONS DIFFUSION THEORY (Rogers, 1995)

- Early adopter
- Late adopter



OBJECTIVES

Objectives

- 1) Examine the determinants of purchase intention for tourist products in a social media context through the opinion of experts in social commerce.
- 2) Assess the effect of early and late adopters on purchase intention and their determinants.



METHODOLOGY

The methodology is known as Fuzzy Cognitive Maps (FCM):

- This theory was proposed by Zadeh (1975) and it has been demonstrated over the years as being capable of coping with vague data in a better way than traditional methods (Wang, Xiaolei, Yunteng & Yin Hai, 2014; Chu & Guo, 2015)
- Significant characteristics:
 - It represents casual relationships between nodes with different intensities represented by fuzzy numbers (-1;1).
 - Dynamic system: The system involves feedback and a change in a concept node may affect other concept nodes, which in turn can impact the node initiating the change.
 - FCM provides mechanisms to develop forecasting scenarios.



METHODOLOGY

The different steps to develop the FCM were:

- Selecting the experts
- Selection criteria
- Heterogeneous panel
- 20 experts

A number of experts between 10 and 20 seems to be a good group size (Clayton, 1997; Okoli & Paklowski, 2004).

- Identifying preliminary nodes
- Review of the literature (tourism technological development, purchase intention, social media, travel motivation and marketing strategy).
- Pilot study
- Final nodes



ID	NODES	
P1	PURCHASE INTENTION	LR
P2	TRUST	LR
P3	PERCEIVED VALUE	LR
P4	REPUTATION	LR
P5	INFORMATION QUALITY	LR
P6	PERCEIVED SECURITY	LR
P7	WORD-OF-MOUTH REFERRALS	LR
P8	PERCEIVED PRIVACY	LR
P9	ECONOMIC FEASIBILITY	P
P10	TIME SAVING	LR
P11	ENGAGEMENT	P
C1	CULTURE	LR
C2	HABIT	LR
C3	PERSONAL INNOVATIVENESS	LR
C4	PERCEIVED DIFFICULTY OF USE	LR
C5	HEDONIC MOTIVATION	LR
C6	SOCIAL INFLUENCE	P
C7	LACK OF PURCHASE EXPERIENCE	P
C8	CLOSENESS	LR

LR: Literature review P: Panel experts

P: Perceptions of social media and its use C: User characteristics



METHODOLOGY

The different steps to develop the FCM were:

- Building the FCM
- Pearson's correlation coefficient.



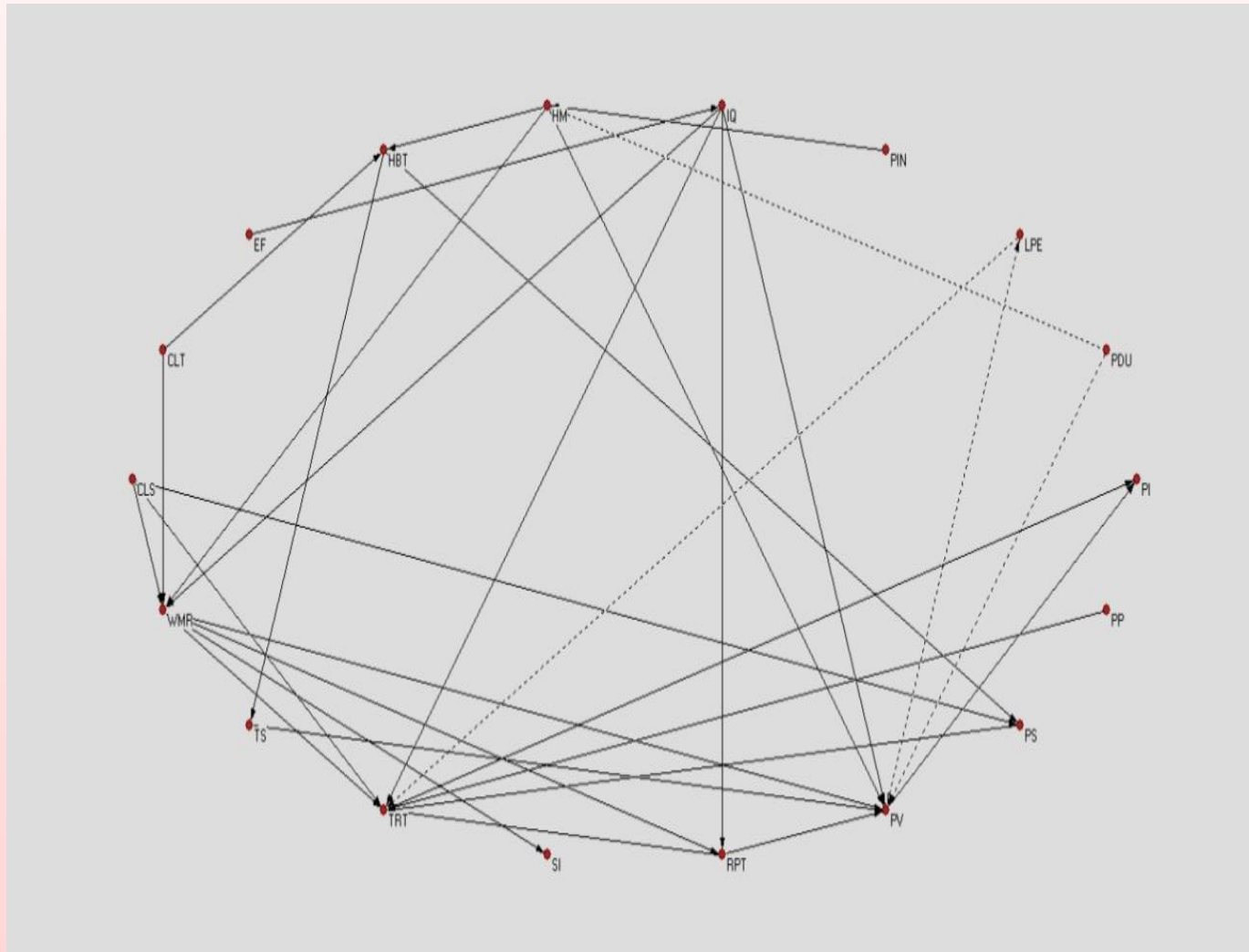
METHODOLOGY

Adjacency augmented matrix

ID	CLS	CLT	EF	HBT	HM	IQ	PIN	LPE	PDU	PI	PP	PS	PV	RPT	SI	TRT	TS	WMR	ENG
CLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.62	0.00	0.98	0.00
CLT	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00
EF	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HBT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.75	0.00	0.00
HM	0.00	0.00	0.00	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.00	0.00	0.00	0.88	0.00
IQ	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.93	0.00	1.00	0.00	0.50	0.90
PIN	0.00	0.00	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LPE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.10	0.00	0.00	-0.32	0.00	0.00	0.00
PDU	0.00	0.00	0.00	0.00	-0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.75	0.00	0.00	0.00	0.00	0.00	0.00
PI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00
PS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00
PV	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RPT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00	0.86	0.00	0.00	0.00
SI	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00
TRT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00
WMR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.98	0.75	0.90	0.00	0.00	0.00
ENG	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.00	0.00



METHODOLOGY



METHODOLOGY

The different steps to develop the FCM were:

- Validation
- Our experts describe the FCM created as an useful and applicable tool in social commerce.



RESULTS

- Clarifying the interrelations between factors:
 - Perceived value (0.76) and trust (0.80) are the factors that have a direct influence on purchase intention.
 - Information quality (0.96) is the factor that most affects perceived value directly. Besides, reputation (0.95) and time saving (0.90) can improve perceived value.
 - The lack of purchase experience (-0.10) and perceived difficulty of social media's use (-0.75) affect perceived value negatively.
 - Information quality (1.00) is the factor that produce the highest effect on trust. Moreover, word-of-mouth referrals (0.90), reputation (0.86), perceived security (0.68), closeness (0.62) and perceived privacy (0.62) are positively related to trust.
 - The lack of purchase experience and perceived difficulty of use are negatively related to trust.



RESULTS

□ Balanced matrix:

Results - Balanced matrix

ID	NODES	
P1	PURCHASE INTENTION	0.811
P2	TRUST	0.951
P3	PERCEIVED VALUE	0.913
P4	REPUTATION	0.895
P5	INFORMATION QUALITY	0.739
P6	PERCEIVED SECURITY	0.697
P7	WORD-OF-MOUTH REFERRALS	0.883
P8	PERCEIVED PRIVACY	0.500
P9	ECONOMIC FEASIBILITY	0.500
P10	TIME SAVING	0.623
P11	ENGAGEMENT	0.660
C1	CULTURE	0.500
C2	HABIT	0.672
C3	PERSONAL INNOVATIVENESS	0.500
C4	PERCEIVED DIFFICULTY OF USE	0.500
C5	HEDONIC MOTIVATION	0.444
C6	SOCIAL INFLUENCE	0.659
C7	LACK OF PURCHASE EXPERIENCE	0.500
C8	CLOSENESS	0.500



RESULTS

□ Scenarios:

1. Early adopter
2. Late adopter

ID	NODES	Scenario	Results	Scenario	Results
		1	simulation 1	2	simulation 2
P1	PURCHASE INTENTION	0	0.819	0	0.791
P2	TRUST	0	0.973	0	0.889
P3	PERCEIVED VALUE	0	0.959	0	0.806
P4	REPUTATION	0	0.903	0	0.865
P5	INFORMATION QUALITY	0	0.739	0	0.739
P6	PERCEIVED SECURITY	0	0.817	0	0.500
P7	WORD-OF-MOUTH REFERRALS	0	0.969	0	0.591
P8	PERCEIVED PRIVACY	0	0.500	0	0.500
P9	ECONOMIC FEASIBILITY	0	0.500	0	0.500
P10	TIME SAVING	0	0.679	0	0.500
P11	ENGAGEMENT	0	0.660	0	0.660
C1	CULTURE	1	1.000	0	0.000
C2	HABIT	1	1.000	0	0.000
C3	PERSONAL INNOVATIVENESS	1	1.000	0	0.000
C4	PERCEIVED DIFFICULTY OF USE	0	0.000	1	1.000
C5	HEDONIC MOTIVATION	1	1.000	0	0.000
C6	SOCIAL INFLUENCE	1	1.000	0	0.000
C7	LACK OF PURCHASE EXPERIENCE	0	0.000	1	1.000
C8	CLOSENESS	1	1.000	0	0.000



RESULTS

☐ Scenarios:

	Early - Late adopter
PURCHASE INTENTION	0.028
PERCEIVED SECURITY	0.317
PERCEIVED VALUE	0.152
REPUTATION	0.037
TRUST	0.083
TIME SAVING	0.179
WORD-OF-MOUTH REFERRALS	0.378



CONCLUSIONS

- ❑ This research creates a model which identifies the relations among the different constructs linked to the intention to purchase touristic products or services in the context of social commerce
- ❑ The results reveal the most important factors where managers have room for improvement, for example hedonic motivation.
- ❑ The main contribution of the study is a simulation model that is adapted to the different types of IT adopters (early and late adopter), showing the main differences between them.
- ❑ This study offers several contributions related to marketing strategy and travel motivation in the development of destination strategies for the tourism industry.
- ❑ This research suggests important practical implications and develops an understanding of how to improve social media in the tourism industry.



LIMITATIONS AND FUTURE WORKS

- ❑ Although the sample size was representative, it only consisted on Spanish experts. In future researchs, the sample could be extended and increased to cover more expert contexts in different cultures.
- ❑ The weight and impact of one's factor influence over others were calculated taking into consideration only the expert opinions. Therefore, the subjectivity of these measurements and calculations must be considered.
- ❑ The simulation of scenarios demonstrated applicability and usability of the proposed model and it was the aim of the research. However, other scenarios could have been simulated. We invite researchers to propose further possible scenarios.



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