

REPUTATION-BASED LIFE-COURSE TRAJECTORIES OF ILLICIT FORUM MEMBERS

Botconf'13, Nantes (France)



BLACK MARKETS



ONLINE BLACK MARKETS

- Convergence settings for online offenders
- Social organization of online black markets
- Division of labour
- Size and impact of online black markets

BENEFITS OF ONLINE BLACK MARKETS

- Protection and means of resolving conflicts
- Social networking
- Information gathering
- Product assessment

THREATS IN ONLINE BLACK MARKETS

- Law enforcement agencies
 - Centralization of information
 - Archival of information
 - Double agents
- Other threats
 - Administrators
 - Other participants



SIGNALLING THEORY



AUTOMATED REPUTATION SYSTEMS

Top-rated seller  **Top-rated seller**

jtbooks (3479 ★)

100% Positive feedback

- ✓ Consistently receives highest buyers' ratings
- ✓ Ships items quickly
- ✓ Has earned a track record of excellent service

[Save this seller](#)

[See other items](#)

RESEARCH AIMS

1. Explore the importance of time in reputation systems
2. Assess the relationship between the position of offenders and their reputation score

DATA

- Online black market where [botnet](#) related services were bought and sold
- 4,723 profiles
 - Active at least 12 months
 - At least 1 reputation point lost or gained
- 12 month sample between 2008 and 2011

METHODS

1. K-means clustering algorithm
 1. Creation of 4 clusters (A, B, C, D)
2. Social network measures Interval 1 / Interval 2
 1. Degree centrality
 2. Betweenness centrality

DESCRIPTIVE STATISTICS

		No. days	Age	No. nicks	No. hours	No. referrals	No. posts
Cluster A	N	1310	950	1310	1310	1310	1310
	M	740	24	3.8	468.8	0.5	30.9
	STD	144	11	11.0	437.9	1.2	85.4
Cluster B	N	387	216	387	387	387	387
	M	761	23	8.1	1041.2	1.0	39.9
	STD	125	14	14.3	682.9	2.0	86.6
Cluster C	N	172	111	172	172	172	172
	M	663	24	7.0	719.7	0.7	40.1
	STD	103	13	12.5	429.4	1.9	97.9
Cluster D	N	152	75	152	152	152	152
	M	688	23	12.9	1434.1	1.3	51.3
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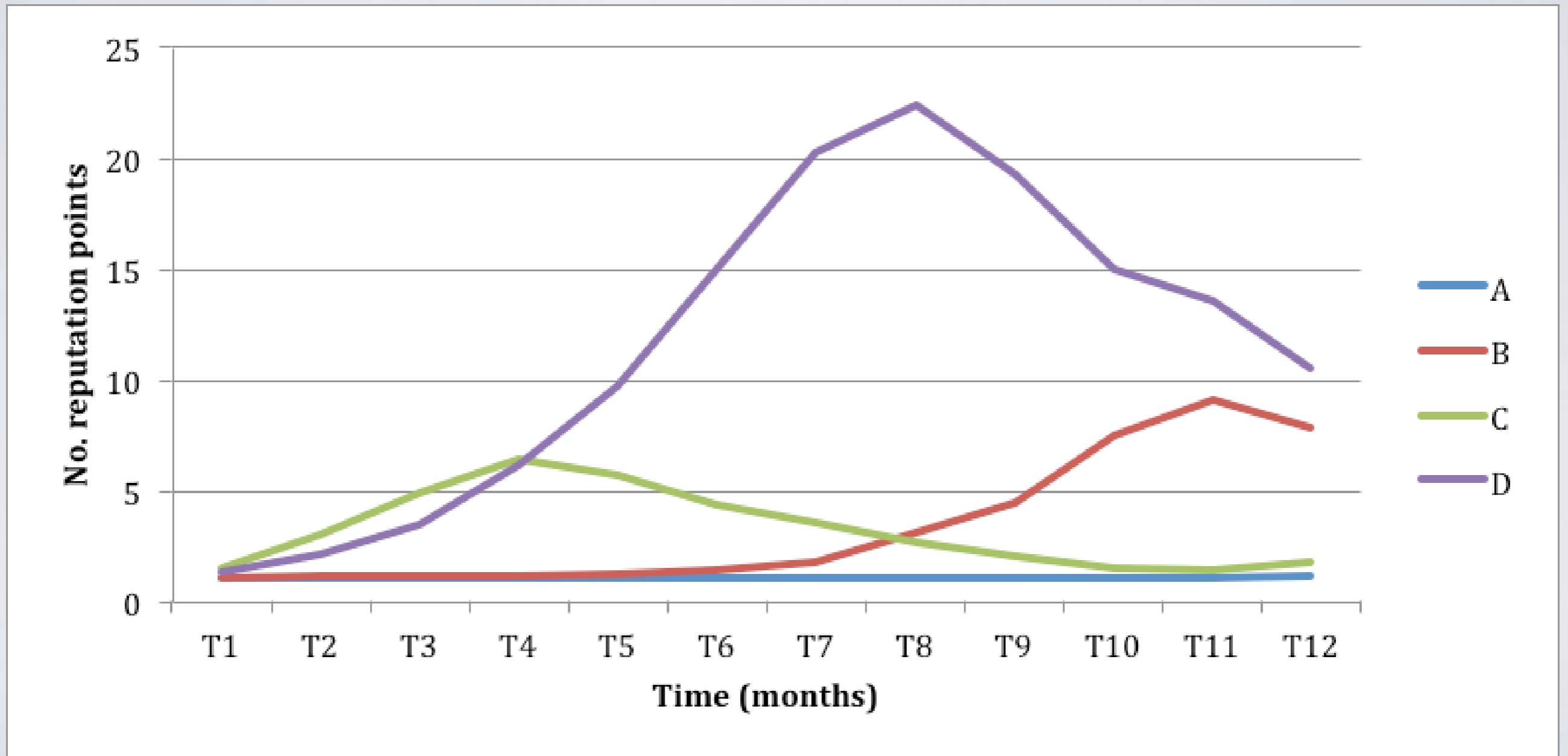
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K-MEANS CLUSTERING



SNA MEANS DIFFERENCES

	FIRST INTERVAL								
	Cluster A		Cluster B		Cluster C		Cluster D		K-W
	M	SD	M	SD	M	SD	M	SD	
Degree	0.015	0.059	0.018	0.057	0.031	0.091	0.031	0.094	0.000
Betweenness	0.001	0.006	0.001	0.004	0.002	0.010	0.003	0.015	0.000

	SECOND INTERVAL								
	Cluster A		Cluster B		Cluster C		Cluster D		K-W
	M	SD	M	SD	M	SD	M	SD	
Degree	0.007	0.031	0.016	0.045	0.011	0.037	0.012	0.049	0.000
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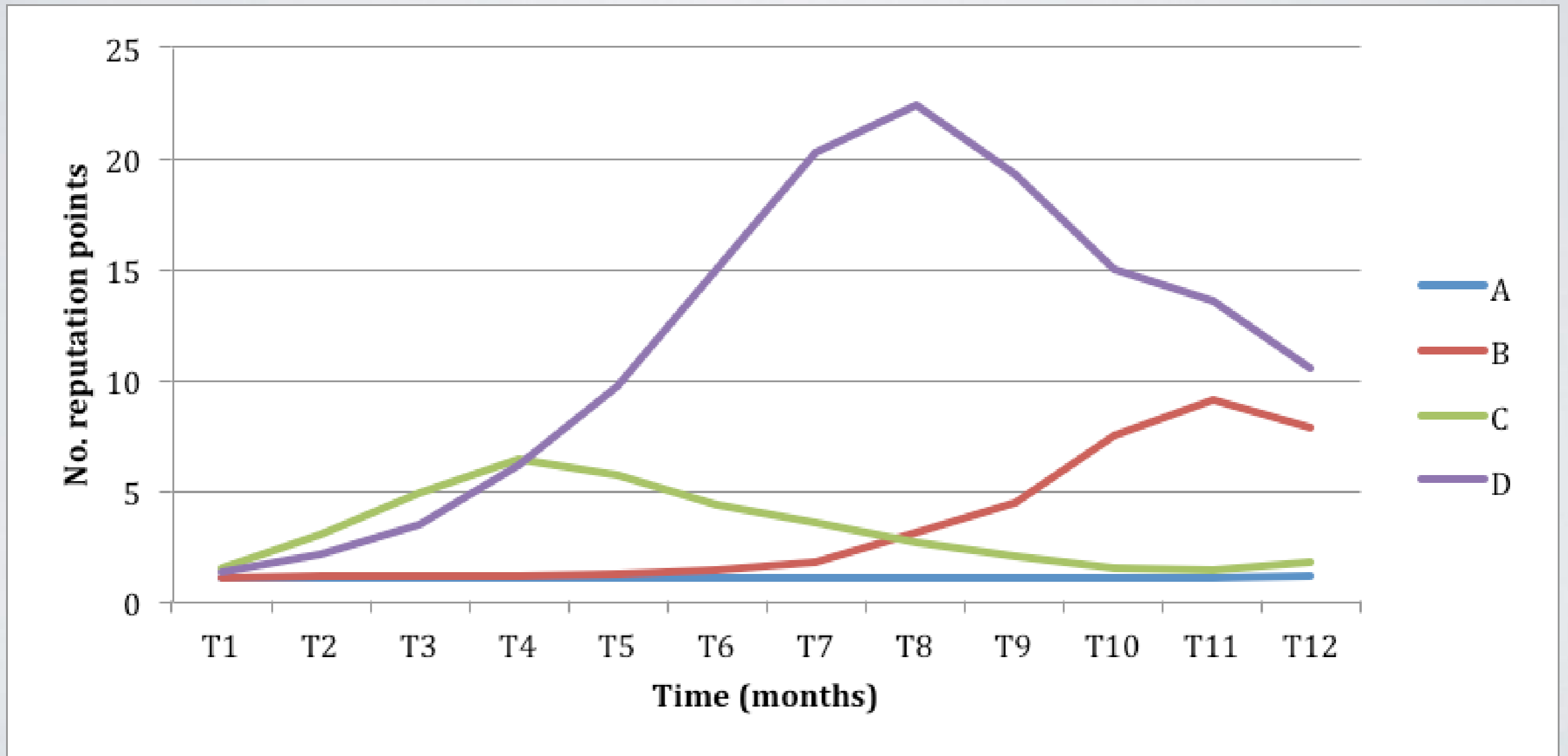
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DEGREE CENTRALITY FIRST INTERVAL

	A	B	C	D
A		<	<	<
B			<	<
C				n/a
D				

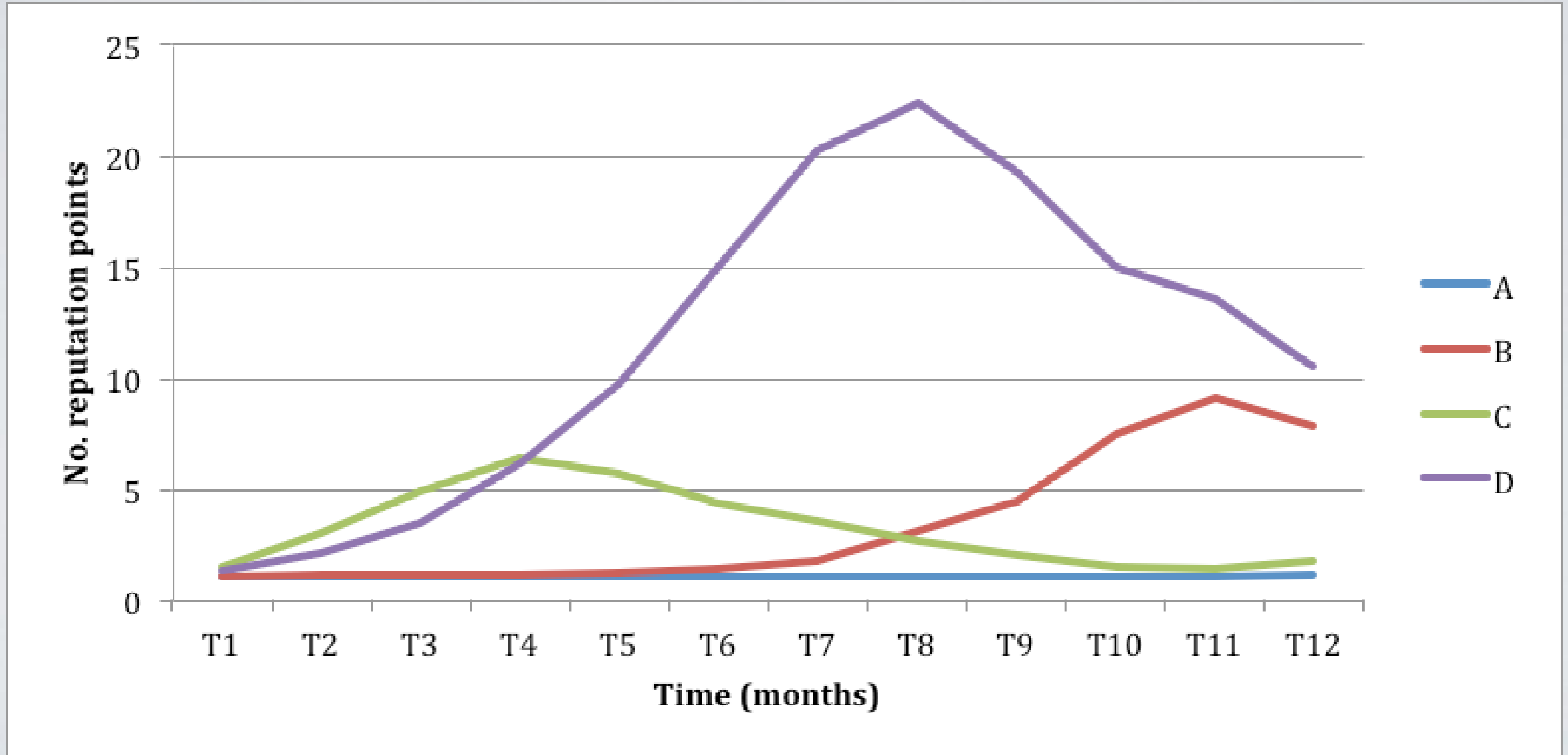
K-MEANS CLUSTERING



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	A	B	C	D
A		<	<	<
B			>	>
C				n/a
D				

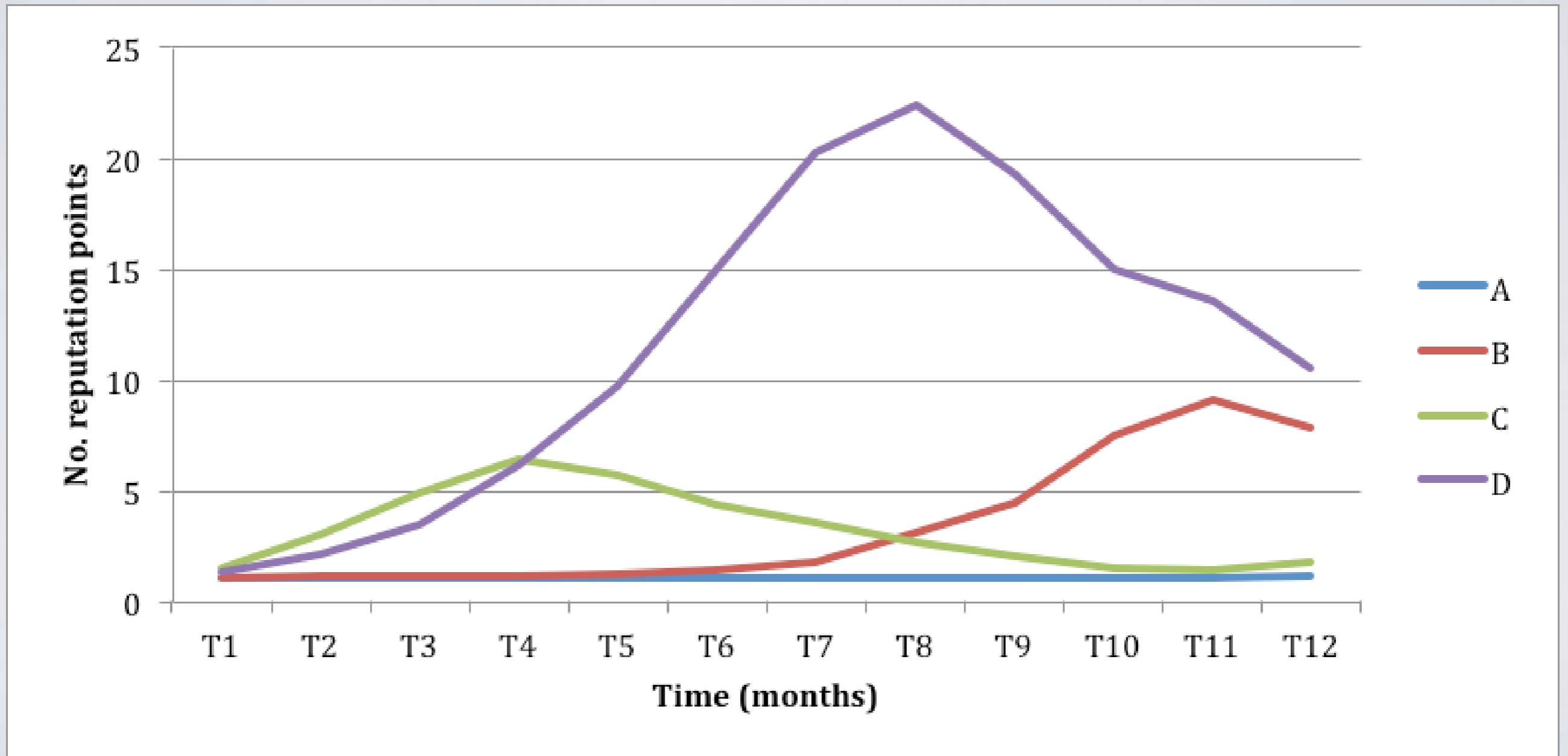
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BETWEENNESS CENTRALITY FIRST INTERVAL

	A	B	C	D
A		<	<	<
B			<	<
C				<
D				

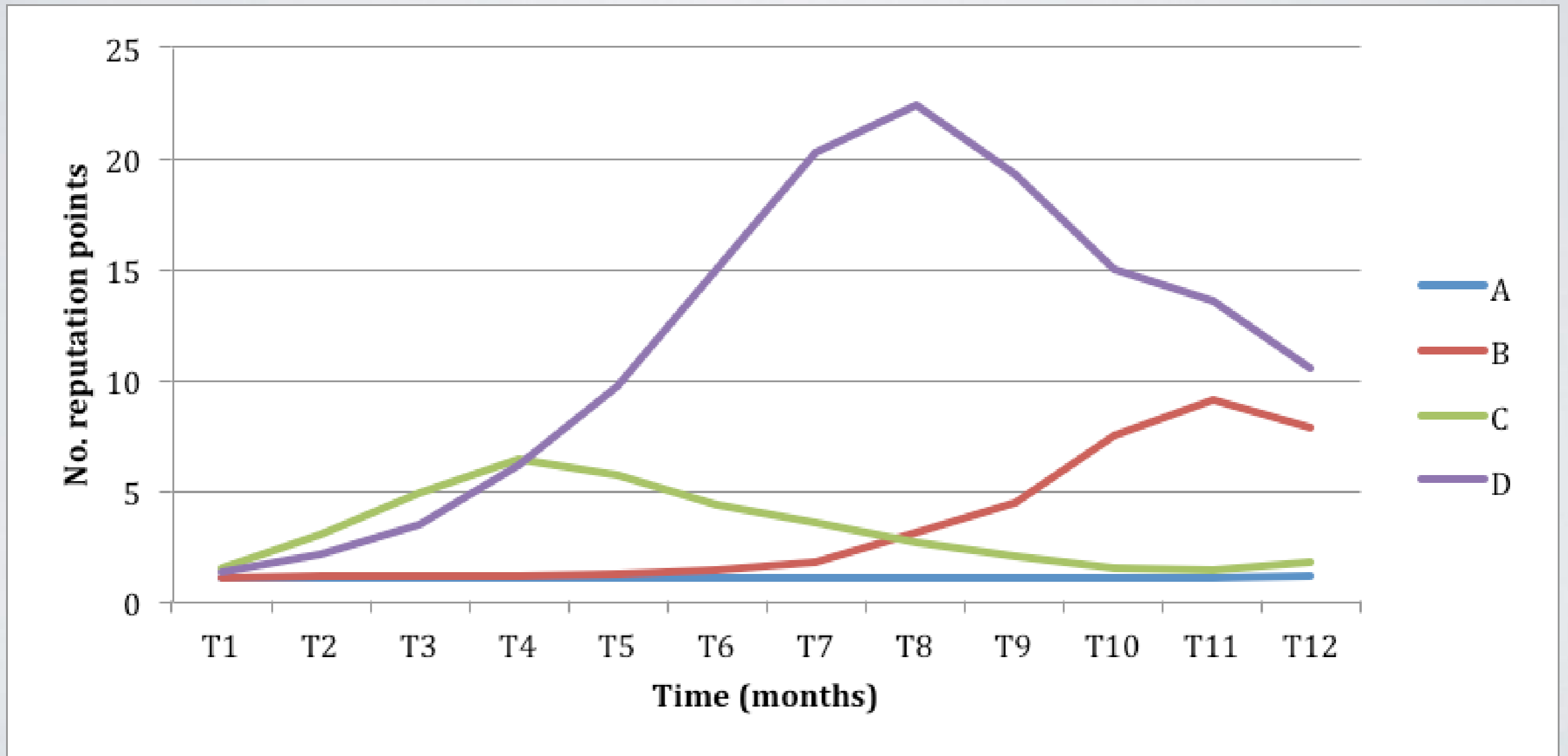
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	A	B	C	D
A		<	<	<
B			>	>
C				n/a
D				

K-MEANS CLUSTERING



DISCUSSION

- Difficult to build a reputation online
- Criminal achievement and reputation
- Reputation to identify key players
- Do all participants want a high reputation score?
- Reliability of online offenders

CONCLUSION

- Automated reputation systems as tools to understand the social organization of markets
- Reputation must be open and accessible by all
- Importance of empirical work in this field

“Few people think more than two or three times a year. I have made an international reputation for myself by thinking once or twice a week.”

- George Bernard Shaw



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