

Citizen Cards' Benefits Based on Grey System Theory

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This paper investigates issues related to Malaysians' acceptance of My Kad National Identity Card (NIC). A questionnaire was designed and two hundred samples were collected from citizens. The data were analyzed using descriptive and inferential statistics. Results show that Perceived Credibility, Performance Expectancy, Facilitating Conditions, and Anxiety are direct determinants in influencing Intention to Use. Results also reveal that Malaysians have mediocre acceptance of MyKad NIC owing to the above determinants. Recommendations are given to increase the acceptability of smart NIC which are useful for countries implementing smart NIC initiatives. Based on the author's several years' experience in this industry, this paper gives also an analysis on the data from some typical city's citizen card management, to provide some suggestions of how to promote the citizen card to achieve highest benefits in China.

Keywords: Citizen Card, Grey System Theory, Grey Relational Analysis, Grey Relational Degree

1. Introduction

1.1 Research Background

In USA, one million people access to legal residency as "green card" holders (US Dept of Homeland, 2012). Despite this card has no other functionality linked to it (it is a mono-purpose card), This card is looked with envy by many other people in the world. On the contrary, Kad pengenalan Malaysia commonly named "MyKad" is the world's first multipurpose smart national identical card (NIC). Malaysians' acceptance of MyKad National Identity Card (NIC) is very low as it appears from a questionnaire answered by two hundred citizens. Perceived Credibility, Performance Expectancy, Facilitating Conditions, and Anxiety were directly correlated to the intention to use, in reference to the acceptance model initially developed by Ajzen and Fishbein model (1980), adapted to technology acceptance by Davis (1989), and improved by Dillon & Morris (1996).

Through reorganizing service resources, citizen cards achieve the goal of "all in one universal card" to provide convenient service for citizens so as to promote a city's consumption and innovate a city's management and service. Citizen card has already been a city's name card which represents the city's characteristics. Taking "reorganizing resources, optimizing management and serving people" as purpose, standardizing various city cards as method and blending the function of government service, public business, commercial applications and financial payment, citizen card is an universal card with multi-purposes to provide payment service for citizens, promote city consumption and innovate city management and service.

Developed countries like America and countries in Europe issue a payment card which is similar to citizen card with mixture of several service functions to serve the society and people (Loo et al., 2011). Currently, about 30% of China's cities, such as Hangzhou, Suzhou, Yangzhou, Lanzhou, Chengdu and Wuhan, have carried out citizen card or similar card system. Citizen card is managed by self-managing and self-financing companies, which ensures the implementation of citizen strategy and goals. With more and more cities promoting its use and explaining how to cultivate the habit of consumption with citizen card, the consumption scale will enlarge and the industry may realize it has already become the biggest problem and challenge for citizen card companies of various countries.

Citizen Card Brings Out Three Positive Issues

1. First, it is convenient for citizens to conduct personal affairs and enjoy various public services and convenient services. Reorganizing social security card, public transformation card, park card, hospital card, provident card, parking card, fuel card, consumption card, resident card, temporary resident card and library card and so on, citizen cards blend their functions so that citizens travel, go to hospital and conduct personal affairs with only one card which is universal in the city and citizens could live a high quality life.
2. Second, it is convenient for government to share information resources, to offer service collaboratively, to provide some references for the public policies, to give business and technique supplies for the implementation of public policies, to promote the construction of smart city and to increase government efficiency. At the same time, advanced and speedy consumption mode could extremely increase a city's consumption capacity and help economy and society develop in a creative way.

3. Third, as for society, citizen card, as a basic project for a city's development, provides services like payment and liquidation, client relationship management and credit, so as to promote the construction of e-commerce and increase the social service efficiency.

Based on the data from the operation of citizen card in a middle city of China, and thru the perspective of grey system theory, this paper makes a study of the relationship among payment capacity, card issuing amount, card swiping times, recharging times and amount of money, in order to deduct a series of suggestions for promoting the citizen card's benefits and development.

1.2 Research Purpose and Significance

According to the author's experience of construction and operation in citizen card area, a citizen card grey relational analysis mode can be built, based on the data analysis and literary review, to study the relation among related factors to provide development suggestions for citizen card.

Grey system theory is a method which judges the relation degree among factors according to the similarity degree of geometry curves of these factors' changes (Liu et al., 2016; Lu 2015). Taking amounts deducted from cards, card issuing amounts, card swiping times, recharging times and recharging amount of money as sample data, this paper uses grey system theory to evaluate the relation of factors.

Investment, export and consumption, the traditional driving forces for economical development have met some hindrance and cities are faced with the challenges of transformation (Lin et al., 2006). How to cultivate and develop new types of consumption mode is challenging for cities. At the same time, with the development of people's living standards, the consumption demand and capacity are also increasing. People's demand for a more convenient consumption method and a more rich consumption mode is urgent. Citizen card is the necessary product to cope with this background. Various citizen card companies in cities are exploring how to give full capacities to citizen card and to create more benefits with limited operation cost. This paper makes a study on the relation among amount deducted from card, card issuing amount, card swiping times, recharging times and recharging amount of money based on grey system theory to provide references for the rapid and effective operation of a multipurpose citizen card.

1.3 Methodology

1.3.1 Data Origin

In order to analyze the relation among key factors, 58 months' management data from August of 2010 to May of 2015 of some city's citizen card system have been collected as a sample in the following table

Table 1 Sample Data from Some City's Citizen Card (January 2011 to May, 2015 Per Year)

Date	Amount Deducted from Card (Yuan)	Card Issuing Amount	Recharging Times	Recharging Amount of Money(Yuan)	Card Swiping Times
2015-05	964,694	5,583	10,711	1,279,080	754,471
2015-04	1,026,735	5,874	10,992	1,312,928	816,803
2015-03	1,050,617	6,037	14,093	1,709,756	869,061
2015-02	773,110	3,217	8,270	962,794	561,436
2015-01	1,076,922	6,838	11,374	1,401,395	831,107
2014-12	1,085,704	5,838	13,515	1,512,719	858,232
2014-11	1,043,592	6,251	12,232	1,337,336	799,131
2014-10	1,026,146	6,292	12,151	1,338,785	769,540
2014-09	1,047,815	8,312	11,776	1,433,067	803,569
2014-08	1,023,050	15,355	13,512	1,393,952	784,259
2014-07	1,135,762	2,894	13,271	1,538,393	856,599
2014-06	1,005,883	7,842	10,779	1,224,863	800,570
2014-05	1,063,014	6,620	10,189	1,173,436	841,056
2014-04	1,173,798	5,988	11,418	1,301,957	931,583
2014-03	1,210,051	5,927	12,511	1,473,658	1,018,551
2014-02	863,214	3,893	11,674	1,390,549	729,726
2014-01	1,102,322	4,780	9,997	1,086,089	898,883
2013-12	1,147,880	6,184	11,349	1,266,334	941,861
2013-11	1,109,395	7,224	10,629	1,179,589	922,899
2013-10	1,068,039	5,899	9,803	1,132,322	851,367

2013-09	1,079,808	5,814	10,350	1,195,493	864,270
2013-08	1,051,518	7,281	11,608	1,361,787	832,748
2013-07	1,110,385	10,569	12,099	1,376,679	889,162
2013-06	1,039,982	9,355	9,464	1,033,950	836,683
2013-05	1,118,267	6,202	10,612	1,221,378	898,587
2013-04	1,082,768	6,443	10,312	1,134,839	906,282
2013-03	1,168,930	5,845	12,626	1,391,706	975,997
2013-02	699,800	3,260	9,906	1,148,559	593,117
2013-01	1,014,464	6,489	10,726	1,151,990	834,426
2012-12	1,020,108	4,817	10,263	1,142,697	812,863
2012-11	874,901	12,137	9,421	1,051,665	710,950
2012-10	777,417	1,671	8,437	939,005	624,008
2012-09	769,863	3,983	9,047	1,004,629	627,015
2012-08	714,157	10,798	9,587	1,049,026	587,982
2012-07	647,118	12,153	9,771	1,059,408	556,880
2012-06	487,861	11,759	6,976	715,196	414,828
2012-05	402,446	8,413	6,469	687,124	340,650
2012-04	270,427	5,512	4,564	489,433	229,567
2012-03	192,233	7,904	3,521	360,550	168,890
2012-02	125,228	63,792	2,740	277,900	111,656
2012-01	72,118	3,849	1,685	156,100	62,442
2011-12	68,985	6,216	1,382	131,095	56,032
2011-11	47,770	5,532	913	85,850	38,209
2011-10	43,440	112,630	856	77,200	31,585
2011-09	39,675	7,123	1,168	96,900	28,796
2011-08	37,102	10,369	1,470	125,310	27,741
2011-07	28,554	53,844	2,420	205,503	20,605
2011-06	20,674	25,393	1,410	124,330	13,265
2011-05	13,934	290	1,214	102,002	10,061
2011-04	10,898	11,595	1,014	93,750	7,372
2011-03	4,677	16,701	742	66,702	3,983
2011-02	1,996	27,431	171	16,650	1,571
2011-01	1,463	104,995	141	13,900	957
Total	37,036,711	717,013	423,331	47,537,307	29,759,884
Year	Amount deducted from card (Yuan)	Card issuing amount	Recharging times	Recharging amount of money(Yuan)	Card swiping times
2015 (5 months)	4,892,079	27,549	55,440	6,665,953	3,832,878
2014 (year)	12,780,353	79,992	143,025	16,204,803	10,091,699
2013 (year)	12,691,235	80,565	129,484	14,594,626	10,347,399
2012 (year)	6,353,876	146,788	82,481	8,932,733	5,247,731
2011 (year)	319,168	382,119	12,901	1,139,192	240,177
Total	37,036,711	717,013	423,331	47,537,307	29,759,884

1.3.2 The Grey System Theory

Grey system theory is a systematic science theory proposed by famous scholar Deng Julong in 1982 (Wei, 2014); its objective is to deal with systems with systems with high uncertainty mostly in the case of discrete, incomplete multi-variables (Lu, 2015). Grey relational analysis could evaluate the relation degree among factors according to the similarity degree of geometry curves of these factors' changes. Through the quantitative analysis of development trend of dynamic process to complete, it compares among related data geometry of time sequence in system, and get the grey relational degree between a reference sequence and some comparative sequences. The calculation steps of grey relational analysis are as follow

Step One Determine the Sequences to be Analyzed

Determine the reference sequences that could represent the system behavior and the comparative sequences that could influence the system behavior. The data sequence that could represent the characteristics of system behavior is called "reference sequence" (the dependent variable), while the data sequences factors which could affect system behavior are called comparative sequences (independent variables). The reference sequence (also called generating sequence) is $Y = \{Y(k) | k = 1, 2, \dots, n\}$ and the comparative sequences (also called subsequence) are $X_i(k) = \{X_i(k) | k = 1, 2, \dots, n, i = 1, 2, \dots, n\}$.

Step Two: Make Variables Dimensionless

Dimensions of the data in sequence of variables may have different units, so it is difficult to get accurate conclusion when making comparison, therefore, variables would be made dimensionless before conducting grey relational analysis.

$$x_i(k) = \frac{X_i(k)}{X_i(\ell)}, k = 1, 2, \dots, n; i = 0, 1, 2, \dots, m$$

Step Three: Calculate the Relational Coefficient

The relational coefficient between $x_0(k)$ and $x_i(k)$

$$\xi_i(k) = \frac{\min_i \min_k \Delta_i(k) + \rho \max_i \max_k \Delta_i(k)}{\Delta_i(k) + \rho \max_i \max_k \Delta_i(k)}$$

Where $\rho \in (0, \infty)$ is called identification co-efficient. The smaller the ρ is, the bigger the identification coefficient is. Generally, the range of ρ is $(0, 1)$, depending on concrete situation. When $\rho \leq 0.5463$, the identification is best. Generally $\rho = 0.5$ (This paper also uses 0.5).

Step Four: Calculate the Relational Degree

Relational coefficient is relational degree numbers of comparative sequences and reference sequence at different time (points in the curve), therefore, there are many relational coefficients. It is necessary to narrow down all the relational coefficients (points in the curve) to one, namely its average number, to represent the relational degree between comparative sequences and reference sequence, the equation is as follow

$$r_i = \frac{1}{n} \sum_{k=1}^n \xi_i(k), k = 1, 2, \dots, n$$

Step Five: Ranking Relational Degree

Relation degrees are ranked by number. If $r_1 < r_{2i}$, then reference sequence y is more similar to comparative sequence x_2 . After calculating the relational coefficient between sequence $x_i(k)$ and sequence $Y(k)$, the average of relational coefficients would be calculated and the average is called the relational degree between $Y(k)$ and $x_i(k)$.

2. The Grey Relational Analysis of Sample Data from Citizen Card

2.1 Sequences to be Analyzed

The benefits of citizen card companies from cards and related aspects (like advertisements and activities) come from the following two aspects

1. First, precipitation fund. Precipitation fund comes from two parts. One is the deposit when citizens apply for a card, generally from 10 yuan to 30 yuan. The other one is citizen's consumption precipitation funds, namely the funds prepaid in advance. Though the money belongs to the card holders, citizen card companies have the right to manage these funds, carry out some financial services under controllable risks and earn 1.8% interests rate differential. Therefore, the precipitation fund is a main factor affecting citizen card benefits from companies.
2. Second, exchange fund. If the citizen card companies have the third party payment permit issued by People's Bank of China, then they could charge 0.3% - 2% service fee. Therefore exchange fund is another important factor effecting citizen card benefits.

This paper emphasizes on how to increase the citizen card exchange fund. Based on the production data from some city's citizen card, the relation among other factors that have influence on amount deducted from card would be analyzed.

The following chart presents the main observed variables of the systems, for 58 months

- Amount deducted from card
- Card issuing amount
- Recharging times
- Recharging amount of money
- Card swiping times

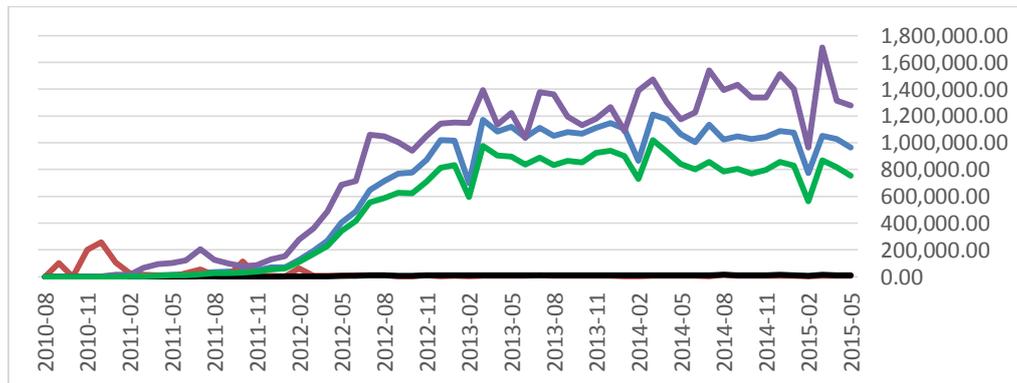


Chart 1 Analysis of the Trend of Factors of Citizen Card
 Blue= Amount Deducted; Red=Issuing Amount; Black=Recharging Times; Purple=Recharging Amount; Green=Card Swiping Times

Chart 1: Analysis of the Trend of Factors of Citizen Card

It is suggested in Chart 1 that amount deducted from card, card issuing amount, recharging times, recharging amount of money, and card swiping times are in normal distribution. This paper will put emphasis on the influence of these factors on the amount deducted. In this model, the amount deducted from card is the dependent variable and the other variables (named sequences in the grey system theory) are the issuing amount (subsequence one), recharging times (subsequence two), recharging amount of money (subsequence three) and card swiping times (subsequence four).

2.2 Making Variables Dimensionless

Among the above factors, amount deducted from card and recharging amount of money are monetary unit, namely yuan in RMB, while card issuing amount, recharging times and card swiping times are numbers, therefore the analysis bases are not in a same level, so it is hard to get accurate conclusion. The variables would be made dimensionless at first and four decimal places would be used to get more accurate analysis. Based on the method mentioned in 1.3.2, the processed conclusion is as follow

Table 2 Dimensionless Sequence Data

Date	Characteristic sequence (Generating sequence1)	Subsequence 1	Subsequence 2	Subsequence 3	Subsequence 4
	Amount deducted from card	Card issuing amount	Recharging times	Recharging amount of money	Card swiping times
2015- 05	1.5107	0.2533	1.4673	1.5604	1.4704
2015-04	1.6079	0.2665	1.5058	1.6017	1.5919
2015-03	1.6453	0.2739	1.9306	2.0858	1.6937
2015-02	1.2107	0.1460	1.1329	1.1746	1.0942
2015-01	1.6865	0.3103	1.5581	1.7096	1.6198
2014-12	1.7002	0.2649	1.8514	1.8455	1.6726
2014-11	1.6343	0.2836	1.6756	1.6315	1.5574
2014-10	1.6069	0.2855	1.6645	1.6333	1.4998
2014-09	1.6409	0.3771	1.6132	1.7483	1.5661
2014-08	1.6021	0.6967	1.8510	1.7006	1.5285
2014-07	1.7786	0.1313	1.8180	1.8768	1.6694
2014-06	1.5752	0.3558	1.4766	1.4943	1.5602
2014-05	1.6647	0.3004	1.3958	1.4315	1.6392
2014-04	1.8382	0.2717	1.5641	1.5883	1.8156
2014-03	1.8949	0.2689	1.7138	1.7978	1.9851
2014-02	1.3518	0.1766	1.5992	1.6964	1.4222

2014-01	1.7262	0.2169	1.3695	1.3250	1.7519
2013-12	1.7976	0.2806	1.5547	1.5449	1.8356
2013-11	1.7373	0.3278	1.4560	1.4391	1.7987
2013-10	1.6725	0.2676	1.3429	1.3814	1.6592
2013-09	1.6910	0.2638	1.4178	1.4585	1.6844
2013-08	1.6467	0.3304	1.5901	1.6613	1.6230
2013-07	1.7389	0.4795	1.6574	1.6795	1.7329
2013-06	1.6286	0.4245	1.2964	1.2614	1.6306
2013-05	1.7512	0.2814	1.4537	1.4900	1.7513
2013-04	1.6956	0.2923	1.4126	1.3845	1.7663
2013-03	1.8305	0.2652	1.7296	1.6978	1.9021
2013-02	1.0959	0.1479	1.3570	1.4012	1.1559
2013-01	1.5887	0.2944	1.4693	1.4054	1.6262
2012-12	1.5975	0.2186	1.4059	1.3940	1.5842
2012-11	1.3701	0.5507	1.2906	1.2830	1.3856
2012-10	1.2174	0.0758	1.1558	1.1455	1.2161
2012-09	.2056	0.1807	1.2393	1.2256	1.2220
2012-08	1.1184	0.4899	1.3133	1.2798	1.1459
2012-07	1.0134	0.5514	1.3385	1.2924	1.0853
2012-06	0.7640	0.5335	0.9556	0.8725	0.8085
2012-05	0.6302	0.3817	0.8862	0.8383	0.6639
2012-04	0.4235	0.2501	0.6252	0.5971	0.4474
2012-03	0.3010	0.3586	0.4823	0.4399	0.3292
2012-02	0.1961	2.8944	0.3753	0.3390	0.2176
2012-01	0.1129	0.1746	0.2308	0.1904	0.1217
2011-12	0.1080	0.2820	0.1893	0.1599	0.1092
2011-11	0.0748	0.2510	0.1251	0.1047	0.0745
2011-10	0.0680	5.1102	0.1173	0.0942	0.0616
2011-09	0.0621	0.3232	0.1600	0.1182	0.0561
2011-08	0.0581	0.4705	0.2014	0.1529	0.0541
2011-07	0.0447	2.4430	0.3315	0.2507	0.0402
2011-06	0.0324	1.1521	0.1932	0.1517	0.0259
2011-05	0.0218	0.0132	0.1663	0.1244	0.0196
2011-04	0.0171	0.5261	0.1389	0.1144	0.0144
2011-03	0.0073	0.7578	0.1016	0.0814	0.0078
2011-02	0.0031	1.2446	0.0234	0.0203	0.0031
2011-01	0.0023	4.7638	0.0193	0.0170	0.0019
2010-12	0.0004	11.7579	0.0067	0.0052	0.0003
2010-11	0.0000	9.0922	0.0022	0.0011	0.0000
2010-10	0.0001	0.0023	0.0003	0.0001	0.0000
2010-09	0.0000	4.6133	0.0000	0.0000	0.0000
2010-08	0.0000	0.0022	0.0000	0.0000	0.0000

2.3 Calculating Relational Coefficient and Relational Degree

Based on the method mentioned in 1.3.2, the relational coefficient is 0.5 in this paper and the relational coefficients of every sequence are as follow

Table 3 The Relational Coefficient and Relational Degree of Subsequences

Date	Subsequence 1	Subsequence 2	Subsequence 3	Subsequence 3
	Card issuing amount	Recharging times	Recharging amount of money	Card swiping times
2015-05	0.8241	0.8042	0.8159	0.5910
2015-04	0.8145	0.6360	0.9728	0.7847
2015-03	0.8112	0.3847	0.3333	0.5458
2015-02	0.8470	0.6963	0.8591	0.3333
2015-01	0.8106	0.5815	0.9048	0.4662
2014-12	0.8041	0.5413	0.6026	0.6786
2014-11	0.8135	0.8118	0.9876	0.4312
2014-10	0.8168	0.7560	0.8933	0.3521
2014-09	0.8234	0.8655	0.6722	0.4378
2014-08	0.8669	0.4175	0.6911	0.4417

2014-07	0.7814	0.8193	0.6917	0.3479
2014-06	0.8285	0.6440	0.7313	0.7956
2014-05	0.8119	0.3988	0.4858	0.6953
2014-04	0.7899	0.3943	0.4686	0.7206
2014-03	0.7836	0.4962	0.6940	0.3926
2014-02	0.8337	0.4190	0.3899	0.4528
2014-01	0.7960	0.3333	0.3544	0.6946
2013-12	0.7952	0.4234	0.4657	0.6050
2013-11	0.8069	0.3881	0.4248	0.4871
2013-10	0.8074	0.3511	0.4307	0.8141
2013-09	0.8050	0.3951	0.4865	0.8984
2013-08	0.8174	0.7594	0.9377	0.7106
2013-07	0.8239	0.6865	0.7877	0.9072
2013-06	0.8303	0.3494	0.3749	0.9665
2013-05	0.8003	0.3749	0.4575	0.9988
2013-04	0.8076	0.3866	0.4145	0.4519
2013-03	0.7900	0.6386	0.6240	0.4486
2013-02	0.8615	0.4059	0.4191	0.4924
2013-01	0.8199	0.5992	0.5459	0.6078
2012-12	0.8103	0.4822	0.5199	0.8143
2012-11	0.8780	0.6916	0.7166	0.7899
2012-10	0.8377	0.7431	0.7540	0.9783
2012-09	0.8519	0.8410	0.9168	0.7803
2012-08	0.9038	0.4779	0.5771	0.6788
2012-07	0.9275	0.3543	0.4412	0.4475
2012-06	0.9626	0.4821	0.6700	0.5670
2012-05	0.9598	0.4107	0.5143	0.6337
2012-04	0.9717	0.4693	0.5593	0.7089
2012-03	0.9907	0.4960	0.6134	0.6744
2012-02	0.6857	0.4988	0.6065	0.7304
2012-01	0.9900	0.6021	0.7397	0.8693
2011-12	0.9716	0.6870	0.8093	0.9803
2011-11	0.9713	0.7802	0.8804	0.9942
2011-10	0.5385	0.7837	0.8939	0.9000
2011-09	0.9578	0.6457	0.7971	0.9065
2011-08	0.9348	0.5546	0.6992	0.9352
2011-07	0.7105	0.3835	0.5168	0.9274
2011-06	0.8403	0.5260	0.6487	0.8993
2011-05	0.9989	0.5525	0.6822	0.9634
2011-04	0.9207	0.5942	0.6936	0.9557
2011-03	0.8871	0.6541	0.7484	0.9925
2011-02	0.8259	0.8978	0.9276	0.9989
2011-01	0.5527	0.9129	0.9376	0.9927
2010-12	0.3335	0.9659	0.9788	0.9984
2010-11	0.3928	0.9880	0.9951	0.9999
2010-10	1.0000	0.9989	0.9998	0.9988
2010-09	0.5605	1.0000	1.0000	1.0000
2010-08	1.0000	1.0000	1.0000	1.0000
Relational degree	0.8239	0.6074	0.6854	0.7356

The next step consists of averaging the relational coefficients of every sequence in order to get the relational degree between the generating sequence and its subsequences. The conclusion from above table is as follow for the characteristic sequence (generating sequence) – amount deducted from card due to consumption:

- Relational degree of card issuing amount is 0.8239,
- Relational degree of recharging times is 0.6074,
- Relational degree of recharging amount of money is 0.6854,
- Relational degree of card swiping times is 0.7536.

2.4 Rank of Relational Degree

The purpose of grey system theory is to find the subsequence which has highest relational degree with generating sequence. According to the above conclusion, card issuing amount has the highest relational degree while recharging times has the lowest relational degree. The results are presented below:

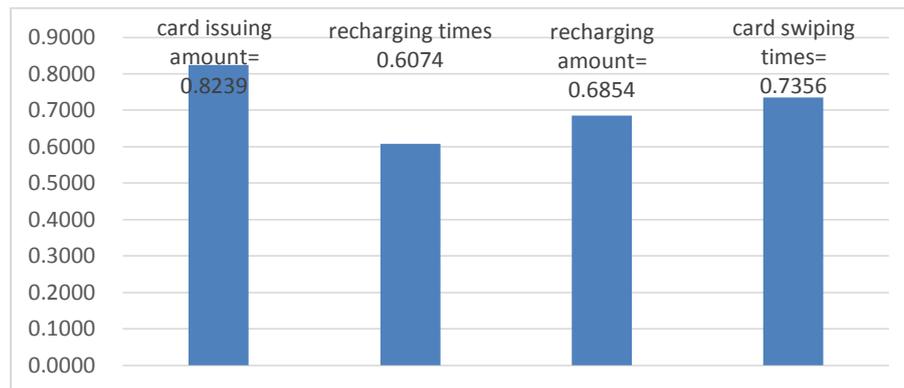


Chart 2 Relational Degree Based on the Generating Sequence of "Amount Deducted from Card"

3. Discussion and Suggestions from Benefit Research of Citizen Card

With the above analysis and the author's experience in citizen card industry, this paper would give an analysis on the extent to which the related factors affect the citizen card benefit and then provide suggestions for promoting citizen card.

In this section the paper will presents analyses of the two factors – card issuing amount and card swiping times – which take the first two places in the rank of relational degree. After which, the relation between consumption habit and age will complement the analysis of results.

Card issuing amount is the base for benefit and citizen should increase their capacity to consume with citizen card. Table 1 has shown the trend of card issuing amount increasing from nearly zero in august 2010 as the consumption is still at beginning. With the increase of card issuing amount, the amount deducted from card is also increasing, based on the 0.82 relational degree in grey system theory, much higher than other factors. As a result, citizen card's benefit capacity mainly depends on card issuing amount. The more the card holders are, the more possibly people consume with cards and the more benefits brought for citizen cards.

Card swiping times depend on citizens' habit and citizen card should increase the scale of consumption with card. Compared with the card issuing amount, card swiping times is lower in relational degree but from the table 1, card swiping times and amount deducted from card are in normal distribution. Therefore, in order to make citizen card benefits increase rapidly, the card swiping times is very important and card swiping times represents directly a city's consumption habit.

Consumption varies according to ages and citizen card should design according to demand. In order to further analyze other related factors affecting the benefits of citizen card, this paper adopts another sample data from August of 2010 to May of 2015, and classifies them by card holders' ages. The method of statistical average is applied to study them and the conclusion is as follow:

Table 4 Card Swiping Capacity of Citizens in Different Ages (Unit: yuan)

	Under 20 years old		21-40 years old		41-60 years old		Older than 61 years old	
	Per card/month	Per purchase	Per card/month	Per purchase	Per card/month	Per purchase	Per card/month	Per purchase
Average	28.74	1.26	52.24	1.25	19.69	1.22	4.11	0.87

The above table analyzes consumption amount of per card per month and consumption amount of per purchase. Per card is referred to the average consumption amount of every card in a month, representing the general consumption capacity of citizen card. Per purchase means the amount of card holders' consumption, showing card holders' per time consumption capacity.

It is suggested from the above table that citizens from 21 – 40 years old have the strongest consumption capacity per month, much higher than other groups. From the perspective of increasing card issuing amount, this group should be taken into consideration and promotion should also put emphasis on them. The per purchase consumption capacities of citizens who are under 60 years old are average. This group of citizens should be taken into consideration to stimulate their consumption behavior and cultivate their consumption habit.

3.2 Suggestions for Promoting Citizen Card

Given the previous results that card issuing amount and card swiping times are the key to increase citizen cards' benefits and the young and middle age people are the focus of promotion, this paper gives now some suggestions for the promotion of citizen cards.

a. Innovate Sales Mode and Realize the Rapid Growth of Card Issuing Amount

Currently citizen card companies adopt personal selling as main sales mode, namely using personal connection to promote citizen card to friends and relatives to stimulate their desire for consumption. Citizen card companies could take the following actions to strengthen selling

1. Citizen card could help government manage cities and develop cities economy. At the same time, many citizen card companies are state-holding, so government has the responsibility to support these companies. It is suggested to deepen the cooperative degree between citizen card companies and government or public business led by government, providing more welfare or conducting more public business through citizen card to stimulate more social groups and citizens to get citizen card.
2. Improve the efficiency of call centers and increase the number of service network spots and enlarging degree of coverage through self-construction and cooperation. At the same time, increase the number of self-service kiosks in the hot spot of consumption, build a good service system, improve clients' satisfaction degree and cultivate long-term and life-long card holder who consume with cards.

b. Cultivate Consumption Habit and Realize the Rapid Growth of Card Swiping Times

Card swiping times depend on card holders' consumption habit and enthusiasm. Following measures could be taken to increase card swiping times

1. Increase innovative products to extend consumption possibilities. According to different social hotspots and special demand, bring out special products to stimulate card swiping frequency, such as 11 of November, Valentine's Day and Children's Day.
2. Increase special offers and rewards programs to stimulate people to buy citizen card. Cooperating with business shops and taking advantages of their promotion activities, for example, cooperate with cinemas, car wash centers and foot massage centers to come up with "watching films with half prices", "wash your car with one yuan" and "10 yuan for foot massage", to increase the consumption frequency of card holders.
3. Strengthen promoting forces. Make a comprehensive use of website, micro blog, we chat, LED screens in networks, televisions and mobile smart devices and invest more in newly-emerged network media (such as micro blog and we chat). These methods could lower promotion funds of citizen card companies but could more easily reach the card holders.

c. Target at Focus Group and Design Special Product According to Demand

Young people are the main group of social consumption; therefore, the design of citizen card should fully take their demand into consideration. Keep adding additional functions into citizen cards that are suitable for different group of people, such as designing special type card for young people and increase reservations in gymnasiums for sports enthusiasts.

4. Conclusion

Though incomparable with factors affecting household consumption, only few factors affecting the benefits of citizen card were included in this exploratory study. The subsequences in this paper are limited so the accurate of the research is also limited.

Further study could be conducted in the following two aspects: on the one hand, increase the numbers of cities to improve the accurateness of research conclusion; on the other hand, take cities' economic development levels and consumption capacity into subsequences to enlarging factors affecting benefits to provide more rich and detailed references for the management of citizen card companies.

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