



# Providing a Solution for the Allocation of Customers' Authentication Methods

Mohsen Ebadi Jokandan,  
Asadollah Shahbahrami

سومین همایش سالانه بانکداری الکترونیک و نظام های پرداخت

[conf.mbri.ac.ir/ebps3](http://conf.mbri.ac.ir/ebps3)



## Agenda

- ❖ Introduction
- ❖ Research Proposed Model
- ❖ Kano Model
- ❖ Two-Step Clustering
- ❖ The proposed Authentication Method for Clusters
- ❖ Research Results



پاسداری آئین و عفت



پژوهشگاه پوی و بانکی  
بانکداری الکترونیک و نظام های پرداخت



طرحت ملی انفورماتیک



## Authentication

- ❖ Electronic Authentication is the process of Establishing Confidence in user Identities Electronically Presented to an Information System.
- ❖ Authentication Methods
  - ❖ Username and Password
  - ❖ One-Time Password
  - ❖ Smart Card
  - ❖ Magnetic Card
  - ❖ Biometric
  - ❖ Challenge-Response



پاسداری امن‌هون



پژوهشکده پی‌سی و آی‌تی

دکتر سحر کرمی، دکتر سحر کرمی



دفترگت ملی انفورماتیک



## Authentication and Customers' Satisfaction

- ❖ Difference between Authentication Methods
  - ❖ Speed, Cost, Accessibility, Security and Ease of use
- ❖ Affect Customers' Satisfaction
- ❖ Example
  - ❖ Offering One-Time Password to an Illiterate Customer
- ❖ Customers' Individual Characteristics Should be Paid Attention
- ❖ Factors Influencing Customers' Satisfaction are Extracted and Ranked
- ❖ Determine the Effect of Customers' Individual Characteristics



پاسداری امن‌هون



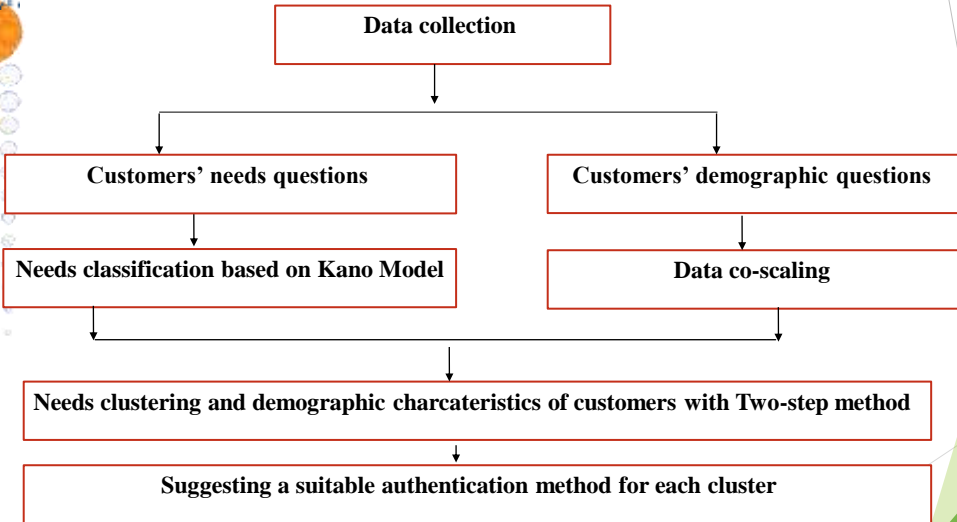
پژوهشکده پی‌سی و آی‌تی

دکتر سحر کرمی، دکتر سحر کرمی

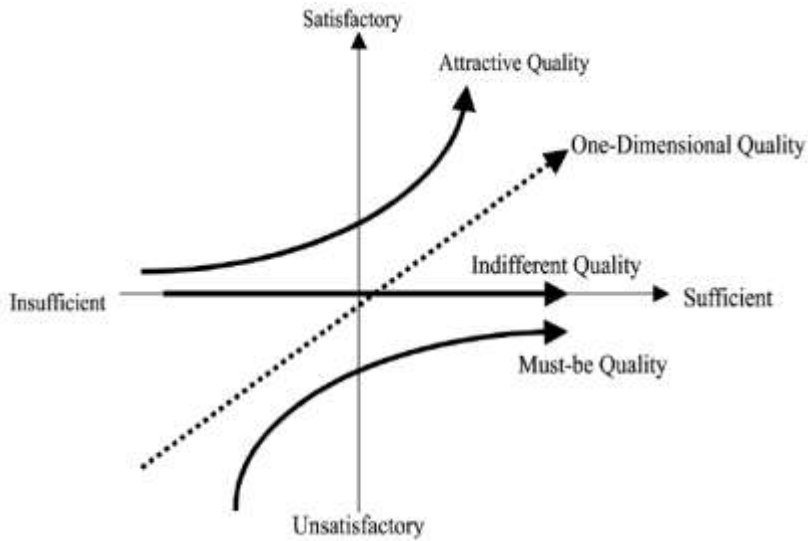


دفترگت ملی انفورماتیک

## Research Proposed Model



## Kano model





## Evaluation Table

Customer requirements		Dysfunctional (negative) question				
		1. like	2. must be	3. neutral	4. live with	5. dislike
Functional (positive) question	1. like	Q	A	A	A	O
	2. must-be	R	I	I	I	M
	3. neutral	R	I	I	I	M
	4. live with	R	I	I	I	M
	5. dislike	R	R	R	R	Q

Customer requirement is ...

A: Attractive  
M: Must-be  
R: Reverse

O: One-dimensional  
Q: Questionable  
I: Indifferent



پاسدانی گیلان



پژوهشکده آموزشی و روانشناسی

دانشگاه گیلان، گیلان، ایران



موسسه عالی آموزش و پرورش



## Classification of Research Variables Using Kano Model

Type of need	Classification				Factor	
	I	A	O	M		
M	۲۴	۹۶	۲۳	۱۵۱	Speed of operations	1
A	۲۶	۱۸۷	-	۸۱	Based on SMS	2
M	۳۲	۸۱	۱۰	۱۷۱	Ease of use	3
M	۲۴	-	۱۰۵	۱۶۵	Availability	4
A	۲۴	۱۹۴	۶۱	۱۵	Biometric	5
M	۹۳	۸۳	-	۱۲۰	Mutual authentication	6
A	۹۳	۱۰۵	۸۱	۱۵	Multifactorial	7
O	۸	-	۲۴۷	۳۹	Support Services	8
I	۱۱۳	-	۱۰۰	۸۱	Cost	9
A	۹۳	۱۶۲	۲۴	۱۵	One-time password	10
I	۲۵۵	-	۳۹	-	Anonymity	11
O	۲۴	-	۲۲۳	۴۷	SSO	12
O	۸۱	-	۱۵۲	۶۱	Mental effort	13



پاسدانی گیلان



پژوهشکده آموزشی و روانشناسی

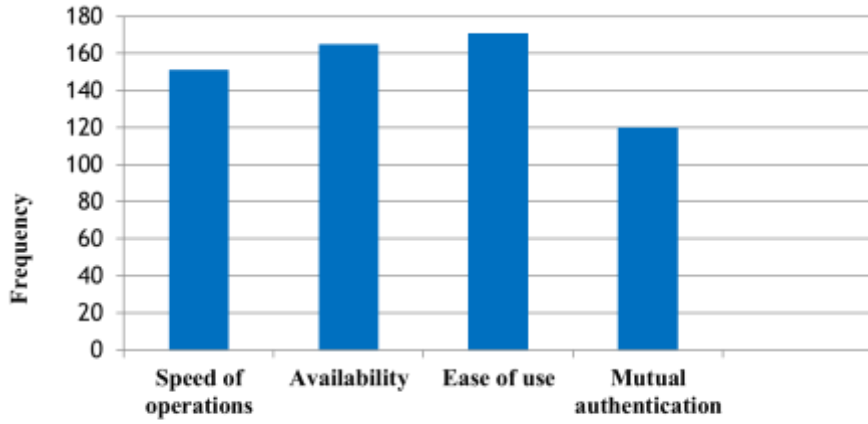
دانشگاه گیلان، گیلان، ایران



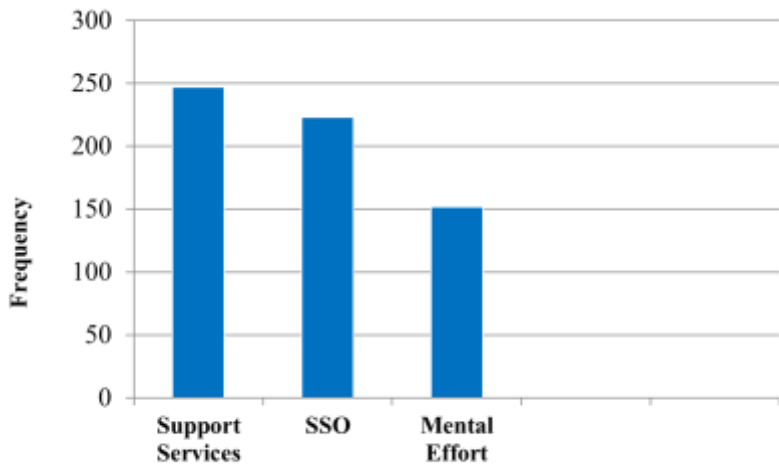
موسسه عالی آموزش و پرورش



### Must-be Needs

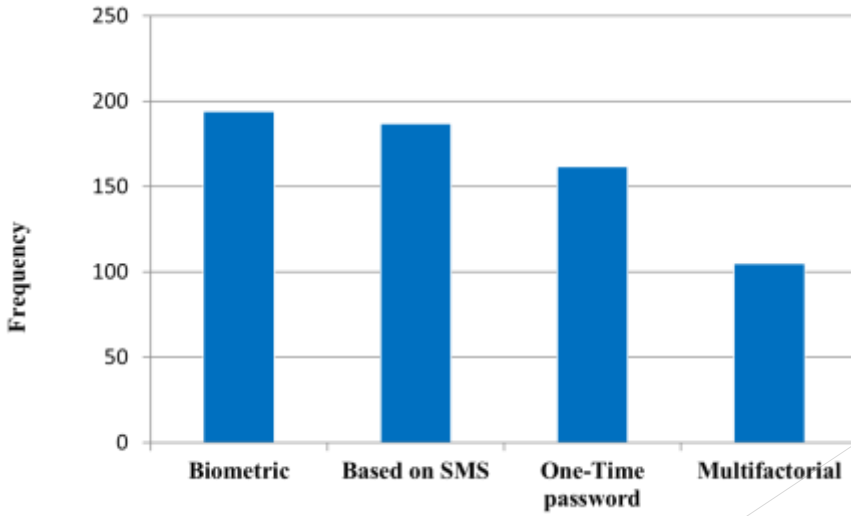


### One-Dimensional Needs





### Attractive Needs

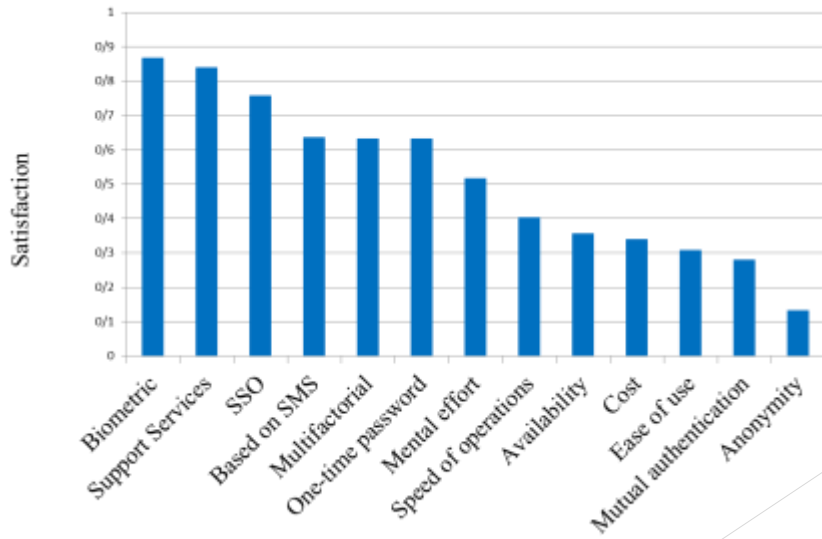


پاسداری تهران  
پژوهشکده مهندسی و فناوری اطلاعات  
دفتر فناوری اطلاعات

11



### The Degree of Satisfaction

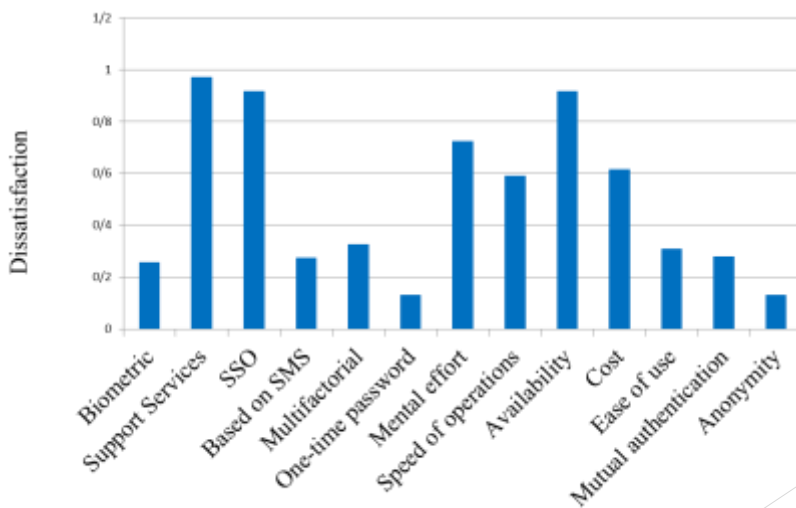


پاسداری تهران  
پژوهشکده مهندسی و فناوری اطلاعات  
دفتر فناوری اطلاعات

12



## The Degree of Dissatisfaction



## Risk and Authentication

The proposed authentication method		Priority
Shared Secret(Password-based authentication, Challenge-Response authentication,Image-based Authentication), Magnetic card, Scratch List and other authentication method.	✓	A
Shared Secret	×	B
software tokens, Magnetic card, Scratch List, Biometric authentication, hardware tokens, Smart Card, SMS/USSD	✓	
Shared Secret , software tokens, Magnetic card, Scratch List, SMS/USSD.	×	C
Biometric authentication, , hardware tokens, Smart Card, Multifactorial method.	✓	



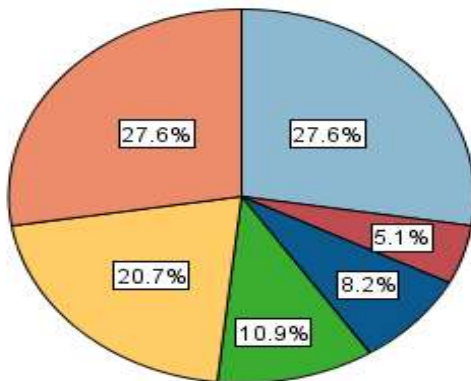


## Cost and Authentication

The proposed authentication method		Priority
Shared Secret(Password-based authentication, Challenge-Response authentication,Image-based Authentication), Magnetic card, Scratch List, SMS/USSD, software tokens	√	A
Biometric authentication, , hardware tokens, Smart Card, Multifactorial method.	√	B



## Kano Model's Need Clustering



cluster

- 1
- 2
- 3
- 4
- 5
- 6







## Clustering Customers Using the Two-Step Method

Cluster6 (81)	Cluster5 (61)	Cluster4 (32)	Cluster3 (24)	Cluster2 (15)	Cluster1 (81)		
C(100%)	B(59%)	B(100%)	C(100%)	C(100%)	C(55.6%)	IT knowledge level	1
A(59.3%)	A(78.8%)	C(62.5%)	C(100%)	C(100%)	D(70.4%)	Income	2
B(98.8%)	A(100%)	A(75%)	B(100%)	C(100%)	C(100%)	Risk	3
B(98.8%)	A(100%)	A(100%)	A(58.3%)	C(100%)	A(100%)	Favorite Equipment	4
O(100%)	O(100%)	M(75%)	O(100%)	M(100%)	O(100%)	Support Services	5
O(100%)	M(100%)	I(75%)	O(100%)	M(100%)	M(100%)	Availability	6
A(100%)	A(57.4%)	A(100%)	A(100%)	A(100%)	M(100%)	Based on SMS	7
M(100%)	O(100%)	O(75%)	I(100%)	O(100%)	I(100%)	Cost	8
O(100%)	O(100%)	M(100%)	I(100%)	M(100%)	O(100%)	SSO	9
A(100%)	O(100%)	I(75%)	A(100%)	M(100%)	A(100%)	Biometric	10
A(100%)	I(100%)	I(100%)	M(100%)	M(100%)	M(100%)	Mutual authentication	11
O(100%)	I(100%)	I(100%)	M(62.5%)	A(100%)	A(100%)	Multifactorial	12
A(100%)	M(100%)	I(100%)	M(100%)	M(100%)	M(100%)	Ease of Use	13
A(100%)	I(100%)	I(100%)	O(100%)	M(100%)	A(100%)	one-time password	14
I(100%)	I(100%)	I(100%)	O(91.7%)	O(100%)	I(97.5%)	Anonymity	15
A(98.8%)	M(100%)	I(71.9%)	O(95.8%)	A(100%)	M(100%)	Speed Operation	16
O(100%)	M(100%)	O(100%)	O(100%)	O(100%)	I(100%)	Mental Effort	17



## The Proposed Authentication Method for Cluster 1

authentication method	Favorite Equipment	Priority
produce One Time Password on mobile phone, Biometric authentication based mobile and Multifactorial method.	Mobile	First
Biometric authentication, hardware tokens, Smart Card	Tokens and Biometric sensors	Second





## The Proposed Authentication Method for Cluster 4,5

authentication method	Favorite Equipment	Priority
Password-based authentication, Challenge-Response authentication, Image-based Authentication	Mobile	First
Magnetic card, Scratch List	Tokens	Second



## Research Results

- ❖ Must-be Requirements
  - ❖ Speed, Easy Access, Easy Use and Identification of the Service Provider
- ❖ One-Dimensional Requirements
  - ❖ Support Services, SSO and Mental Effort
- ❖ Attractive Requirements
  - ❖ Biometric, SMS Receipt, and One Time Password
- ❖ Two-Step Clustering
  - ❖ Extract Relation(ship between Personal Features and Authentication Methods
  - ❖ Risk, Cost, Income, Favorite Equipment





*Many thanks for your  
Time and Attention*



جمهوری اسلامی ایران



پژوهشکده پوی و دانا  
دانشگاه گیلان



فصلت علمی فناوری



### General Information of Respondents

<b>Gender</b>	Man:96 Woman:198	<b>Risk</b>	A level:86 B level:100 C level:108
<b>Age</b>	56:18-25 years 132:26-35 years 66:36-45 years 40:46 years and higher	<b>Income</b>	40000 Tomans and less: 96 401-700 thousands Tomans:46 701-999 thousands Tomans: 83 100000 Tomans and higher: 69
<b>IT knowledge level</b>	Very little:25 Little:68 Middle:165 High:36	<b>Favorite Equipment</b>	Mobile:189 Tokens: 90 Biometric sensors:15



جمهوری اسلامی ایران



پژوهشکده پوی و دانا  
دانشگاه گیلان



فصلت علمی فناوری