The Peruvian Citizen Perception and Expectation toward the e-Government. The Electronic Tax Payment as a Successful e-Gov Project

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ABSTRACT

In this chapter, the authors try to stand out how the Latin American governments, specifically the Peruvian government, can evaluate its efforts implementing electronic administration initiatives, identifying what the citizen expects from the electronic administration and how he or she perceives it, applying an evaluation model to the electronic tax payment service implemented, as a successful initiative at Latin-America. The proposed model to achieve this, was developed by one of the authors during his doctoral dissertation (Cardona, 2004) and evaluated by the other one as dissertation judge. It includes five different independent and latent constructs, Attitude, Aptitude, Trust, Relevance and Satisfaction that affect two dependent and latent constructs, the Citizen Perception and the Citizen Expectative towards its relationship with the Public Administration through the use of Information and Communication Technologies - ICT, under the effect of illustrative variables related with citizen, institutions and context.

Key words, as posted at http://www.idea-group.com/assets/keywords.asp:

- 1. Electronic Government.
- 2. Electronic Tax Payment.
- 3. Perception and expectation evaluation.
- 4. e-gov Peruvian policy.
- 5. Technology Acceptance.
- 6. Peruvian citizen characterization.

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RESUMEN

En este capítulo, los autores tratan de demostrar como los gobierno latinoamericanos, específicamente el peruano, evalúan los esfuerzos que realizan en la implementación de iniciativas de gobierno electrónico, identificando las expectativas que tienen los ciudadanos frente a estas iniciativas y como las perciben, aplicando un modelo de evaluación al servicio de pago electrónico de impuestos implementado como una iniciativa exitosa en Latinoamérica. El modelo propuesto fue desarrollado por uno de los autores como parte de su tesis doctoral y evaluado por el otro como jurado en el tribunal de la misma. Incluye cinco constructos latentes independientes, actitud, aptitud, confianza, relevancia y satisfacción que afecta a dos constructos latentes dependientes, la percepción y la expectativa frente a su relación con la administración pública vía el uso de las tecnologías de la información y las comunicaciones – TIC, bajo el efecto de variables ilustrativas relacionadas con los ciudadanos, las instituciones y el contexto.

Palabras clave: publicadas en http://www.idea-group.com/assets/keywords.asp:

- 1. Gobierno electrónico
- 2. Pago electrónico de impuestos
- 3. Evaluación de la opinión y de la expectativa
- 4. Política del gobierno electrónico peruano
- 5. Aceptación de la tecnología
- 6. Caracterización de los ciudadanos.

INTRODUCTION

Today the Latin-American governments are searching for answers to some community necessities due to the movement toward the knowledge society with the massive implementation of electronic administration initiatives. These projects require an evaluation to fill out the existing theoretical gap from a geographic, competence level, public services offered and its participant's perspectives. By this means, the authors identified the necessary variables required to measure what the citizen expects from the electronic administration and how he or she perceives it. The obtained model was validated with the electronic tax service at the Peruvian context.

In the context of this chapter, the term knowledge society is used to describe the increasing use of the Information and Communication Technologies – ICT and the social, political, cultural and economic impact that it is having in the society, the governments and the economy. Today's society is becoming more interconnected, interactive, instantaneous, into a rich society relating information, informal, and more uncertain (Gualtieri, 1999). This last characteristic is explained by the concept of Digital Divide; understood as the existing difference between individuals, homes, companies, organizations and geographic areas of different socioeconomic levels, due to the opportunity that they have to reach the ICTs and the use they give

to Internet in daily activities (OECD, 2000). On the other hand, the ICT corresponds to a set of activities that facilitate, by electronic means, the filing, processing, transmission and interactive unfolds of information (OECD, 2000).

Another conceptual element used in this chapter, in the field of the Public Administration studies and more precisely in the one of the public policies analysis, is the evaluation as a technique to produce information that serves to improve the decision and planning process; the daily operations management; and in a third place, the final administration results related with the invested resources and therefore its effectiveness and efficiency (Gascó, 2003).

Finally, inside the public management, the electronic government implies, at least, common elements (Cardona, 2004), as for example, that it is related to the ICT application creating innovation in the internal and external relations of the government with other agencies, their own employees, business and citizens. Besides, the electronic government affects the organization and function of government with respect to the access to the information, services delivery, dealings accomplishment, and citizen participation, searching to optimize the use of resources for the achievement of the governmental objectives. On the other hand, its implementation implies the transit trough a series of phases, not necessarily consecutives, and finally, it is a way, not an aim by itself.

This chapter starts with a description of the Peruvian policy implemented to move the country toward the knowledge society with the intensive use of ICT, explaining its strategies and projects, followed by a presentation of a specific project, the virtual tax payment service. The next element on this chapter, introduces the evaluation model used, and finishes explaining that there is enough statistical evidence to conclude that the ICT impact the citizen's perception that the services offered via Internet have improved their relationship with the Public Administration. There is also enough statistical evidence to conclude that, in case of interaction with the Governmental Agencies via Internet, they expect an excellent relationship. Is important to notice that the final evaluation model is equivalent to the one presented to the North American context by a recent study (Moon, Hinnant, & Welch, 2004).

THE E-GOV PERUVIAN POLICY

According to the Global Information Technology Readiness Report for 2004/2005 (Dutta & Lopez-Claros, 2005) the Peruvian infrastructures development index was 4,88 points inside a scale from 1 to 7, ranking

Peru at position 47 among a total of 75 analyzed nations. On the other hand, the Peruvian computer infrastructure can be analyzed from three perspectives, the first of them, the Information Technologies – IT infrastructure, the second one, the Communications Infrastructure and the last but not less important one, the social infrastructure.

In relation to IT (Bustamante, 2002). Peru presents in 2002 an estimated density of Personal Computers of 4.79 by each 100 inhabitants, ranking Peru in the eighth place among the 18 Latin American countries, in contrast with 62.25 in the United States of America. Peru is developing Latin American leaders' projects as the one droved by the National Superintendence of Tributary Administration -SUNAT¹ regarding the customs payment automation (Bermúdez, 2004). In the decade of the 90s, under the direction of the National Institute of Statistic and Computer Science -INEL² the Peruvian government achieved that all the ministries implemented WEB pages for information and services diffusion (PEP, 2003; INEIb, 2002). Regarding the infrastructure of communications, the growth indexes of the decade of the 90 were important but insufficient to cover the country necessities. By the middle of 2003 the fixed telephony penetration in Lima was 13 lines for each 100 inhabitants; while in the rest of the country it was of 3.17, as a result, the total country penetration was 7.75. In contrast, starting in 1991 the Peruvian government offers the Internet access service, achieving in 2003 the fact that more than 3 millions Internet users, and by the middle of 2004 the estimate exceeded 4 millions. For this reason, Peru occupies the third place among Latin-American countries, due to the phenomenon of the Public Booths,³ with an actual penetration of Internet users of 15.4%. Finally, in the social infrastructure education has been identified as a key factor to create, adapt and disclose knowledge, but the Peruvian educational system has not procured the use of the ICT as a learning tool. A critical element is that there is no actualized governmental policy document about e-government.

For the Peruvian case, the only governmental policy document about egovernment corresponds to the Computer Science's National Policy

¹ "Superintendencia Nacional de Administración Tributaria - SUNAT" by its Spanish initials.

² "Instituto Nacional de Estadísticas e Informática – INEI" by its Spanish initials.

³ The public telephon booths are named in Spanish "*Telecentros*" a good example of ICT application at the Latin-American ambit and seen for the Latin-American Public Booths Network http://tele-centros.org/ (July, 2005) also is possible to consult the general project at http://www.sunat.gob.pe/ orientacion/cabinasInternet/infInteres.htm (July, 2005).

-PNI⁴ (SNI, 2002), published at the beginning of 2002 by the INEI on behalf of the so called National System of Computer Science –SNI⁵ (Bermúdez, 2004), this function was developed by the INEI starting in 1990 under the legislative ordinance 563. In that document, a group of strategic plans was presented in order to promote the ICT incorporation in the economic, social and cultural activity of the country, and particularly to the Public Administration, being sustained in three basic pillars (Pasco, 2005); the Political and Social Letter 2001-2006 presented in December 2001, the vision for the years 2001-2021 accompanied by the strategic plan 2002-2006 presented in April of the same year, and the lines of strategic performance defined by the INEI presented in 2000. In 2002, by means of the Ministerial Resolution N° 266-2002-PCM, the task of elaborating an Electronic Government's National Strategy was assigned to the Secretary of Public Administration of the Presidency of the Council of Ministries –PCM⁶ through the Electronic Government's National Office and Computer Science-

ONGEI.⁷ In 2003 the duplicity of existent functions between the INEI and the ONGEI was solved because this one absorbed the INEI Subheadquarters of Computer Science (Parra, 2004).

For April 2005, the ONGEI has still not published an Electronic Government's National Strategy, therefore, the central document continues to be the Plan of Computer Development 2003-2006 (INEIa, 2002) published by the INEI as the guideline instrument for the administration and as integral tool of the proposals and projects guided to improve the efficiency and effectiveness of the institutions to achieve a democratic and decentralized state. With the aim of developing computer activities, the invigoration of Computer Science's National System was possible. Additionally, important efforts have been made as the publication of Transparency and Access to the Public Information Act, the Regulation of Digital Signatures and Certificates (PCM, 2002), and the modification of the Peruvian civil code to allow contracts using electronic means and notifications.

As Mr. Jaime Reyes says, being the Secretary of Public Administration of the PCM, it is clear that there are four purposes in electronic government's context for Peru:

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⁴ "Política Nacional Informática – PNI" by its Spanish initials.

⁵ "Sistema Nacional de Informática – SIN" by its Spanish initials.

⁶ "Presidencia del Consejo de Ministros – PCM" by its Spanish initials.

⁷ "Oficina Nacional de Gobierno Electrónico e Informática – ONGEI" by its Spanish initials.

- 1. Modernizing and decentralizing the Public Administration using ICT. For this reason, the construction of a technological platform was defined to push forward a public management model based on ICT developing on-line public services.
- 2. Promoting the increase of productivity based on an ICT intensive use. For this reason, the research promotion and development in the ICT field was defined together with the stimulus and promotion of human resources in ICT knowledge.
- 3. Promoting the universal access to information and knowledge, based on the massive use of Internet.
- 4. Promoting the Information Society. For this reason a national strategy was designed in order to construct the Peruvian Information Society and to develop and use the ICT for supporting the construction of this society.

An important and successful project of this policy is the Peruvian Customs Tax Payment System, described as follows.

TOWARDS A VIRTUAL PERUVIAN TAX PAYMENT SYSTEM

Context

The vision of the Peruvian Tax Payment System is to move towards a virtual office considering the e-business as paradigm, including all the stakeholders of the tax payment service in an intensive ITC use (BID, 2001).

Under this point of view, the first step developed by the SUNAT in 1999 was to obtain the ISO 9002 certification from the Lloyd's Register Quality Assurance Office, and to include it into the international standards levels, and then in 2000, the Peruvian government started, as a first step in the automation of the tax payment, the implementation of the electronic payment of the customs documents, in order to facilitate these procedures. The next step in 2000 was to permit the intermediaries to pay their obligations via Internet, and for 2004 there was the implementation process of the Tax Payment System via Internet a citizen's benefit, with 32 different procedures,⁸ obtaining such advantages as the improvement of the tax payment cycle, a cost and time reduction, an uninterrupted service schedule 24X7 with high security due to a total payment necessities coverage for tax purposes, and a maximum efficiency with the payment collection procedure.

⁸ A specific relation can be reviewed at http:/ /www2.sunat.gob.pe/pdt/pdtdown/ independientes/independientes.htm (July, 2005).

Before this electronic payment procedure, the face to face procedure implied first a tax declaration acceptation, then an assignation of a Tax Document Code that implied a total cost definition. With this document the citizen had to go to the bank where the payment cost was electronically confirmed by the Tax Office and then the bank was able to register the transaction.

Solution Description

The electronic payment procedure (Drago, 2004) permits the process of customs documents using the website of the Tax Office (http://www. sunat.gob.pe). At this site, the citizen sends the necessary documentation and the payment information. With this data, the system determines acceptation or rejection. If the tax document is accepted, the system will assign a code and will calculate the amount to be payed, then it interacts with the bank and receives the payment or the bank rejection, finally, the system informs the result.

This procedure was designed by the technology division of the Tax Office (*Intendencia Nacional de Sistemas*) following three criteria; the first one, classification: to restrict the access only to the authorized documents. The second one is security, in order to provide the necessary protection of the user data against errors and hackers including privacy, integrity, authentication and the auditing possibilities. The last criterion, flexibility, is to provide growth system capability and technology adaptability.

The electronic payment service provides a functionality that includes access control because the website seeks for username and password, allowing classification, permitting or denying access to specific data, like customs documents pending of payment. The system confirms payment data with the user, making the transaction with the bank and awaits bank's confirmation. The system shows the payment situation for all documents and also sends an electronic message to the user with payment confirmation.

Process

The project implementation process passes through the following phases (Chirinos, 2004):

- 1st Phase: Institutional Policy. The Tax Office assumes diversification as an institutional policy payment in order to improve the tax collection process. The technology division is the area in charge of designing a technological solution.
- 2nd Phase: Electronic Payment Implementation via Tax Website. In 1999 the technology division made a proposal request to develop and implement the technology solution.

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In January 2000 the selected company deploys 4 modules; one for access control with a Graphic User Interface that allows electronic payment procedure and data consultation. In February 2000 there was a testing period in order to refine the application, and then in March 2000 Tax Offices started to use the system.

- 3rd Phase: "Teledespacho" Development. Between August and October 2000 the development group of the technology division creates the so called "Teledespacho" system as a complement to the Internet system.
- 4th Phase: Bank System Adaptation. Due to the fact that payment is made through specific agreements with banks, this association has been vital to the success of the project, and it was very important because banks carried out multiples systems adaptation. Between October 1999 and March 2000 many coordination meetings took place besides the 2000 year effect solution for the financial sector. In June 2000 the Tax Office launched the INAR-PE.08 (Pinglo & Castillo, 2002) procedure incorporating the electronic payment as a new procedure and simplifying it.
- 5th Phase: Service Promotion. In order to promote electronic service and to encorage users to try the system, the Tax Office started in February 2000 a meeting se-

ries to explain this new system, showing the benefits and the affiliation procedure. In April 2000 the first electronic transaction between a bank and an international courier was made, using a web application developed by the Tax Office. The next step was in November 2000 when was made the first electronic transaction using *"Teledespacho"* application.⁹ During the first months of 2001, payment collection growth to an average rate of 57% as is shown at Figure 1.

Finally, is important to note that total investment during this period was about US \$ 89.230, paid directly by the Tax Office (Drago, 2004). The design and development was made directly by the Customs Office's technology division with support of an external company and the participation of multiple internal areas (Chirinos, 2004).

Since October 2004, Peruvian citizens can interact with the Tax Office via Web using the On-line operations services - SOL¹⁰ and 32 different electronic services can be carried out there.

This application can be accessed via WEB at http://www.aduanet.gob.pe/servlet/PAEnter (July, 2005).

¹⁰ "SUNAT Operaciones en Línea – SOL" by its Spanish initials. Can be accessed via WEB at http://www.sunat.gob.pe/ol-portal/fmvirtual. jsp (July, 2005).



Note: Source data (Drago, 2004)



RESULTS

The described project produces, among other results (Llanos, 2004), a 25% time saving in the process, avoiding unnecessary displacements, incrementing security and time and cost savings, it also produces a Tax Office's good will and user's satisfaction due to flexibility with payment schedule (50% of payments are made between 2:00 a.m. and 6:00 a.m.). Also because under the electronic payment procedure it is possible to pay in one transaction any number of document generated through any national office, it also means the consequently costs savings.

For realizing an automatic payment through the electronic payment service it is necessary to be the holder of at least one bank account. In a short term, it will be possible to make a payment using credit cards to include to the system persons like tourists that must nationalize their properties at airports.

WHY TO MEASURE CITIZEN PERCEPTION AND EXPECTATION

From a technological point of view, an evaluation of perception and expectation is carried out to provide and explain the parameters that affect the capacity to go into the knowledge society; for example, existent technological infrastructure, technology information policy, technological coverage at schools, companies, Public Administration and in the whole society, in general. An evaluation is also carried out to identify basic social and cultural factors that influence

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diffusion and the use of technologies, market conditions and, on the other hand, to describe how these parameters can be used for the economic growth, the wide use of technology and their social implications, besides describing clearly how to use the tool or the pattern when analysis is necessary, what results are expected, how to manage discrepancies and what factors are under the Public Administration control and which are not. All the abovementioned is required because the relationship between Public Administration and citizens has become more and more complex, public officials have came to uderstand that they won't be able to drive nor to implement politicies in an effective way if citizens do not understand and support them.

Perception and expectation towards e-government initiatives are related with attitude; the latter understood as the learned predisposition to act toward an object, a person or a situation and includes cognitive, affective, evaluative and behavioral dimensions, arranged in a systematic and structured manner, with elements that are interrelated in such a way that any change in one will affect the other one(s) (Fishbein & Ajzen, 1980; Rubio, 2000; Henerson, Morris, & Fitz-Gibbon, 1987). This approach is called the Theory of Reasoned Action (TRA), in this theory, in order to predict and to understand behaviors, it is necessary to measure the attitudes towards these behaviors, and to identify its subjective norm and relative weights to relate those following specific factors as explained in figure 2.



FIGURE 2

The TRA has been the basis to other works about the Technology Acceptance Model (TAM), developed by Davis (Davis, Bagozzi, & Warshaw, 1989; Davis & Venakatesh, 2000; Davis, 1989; Davis & Venakatesh, 1996; Davis & Venkatesh, 2004). The aim of TAM is to explain technology acceptance determinants as user behaviors, related with percep-

tion and expectative as explained in Figure 3. TAM stands that there are two variables of relevance to measure the technology acceptance, the first one, perceived usefulness, understood as the user's subjective probability in which a system will increase his or her performance inside the organization. The second one, perceived ease of use, understood as the degree in which the user expects that a system will need no efforts.

As TRA, TAM proposes that computer usage is determined by behavioral intention, but that it differs in the fact that behavior is viewed as being jointly determined by the person's attitude toward the system with relative weights. Additionally TAM does not include TRA's subjective norm. It is important to note that in January 2000, there were more than 400 citations of TAM at the Social Science Citation Index, on this basis, this theory can be considered to be so strong defendable (Davis & Venakatesh, 2000), like the TRA (Sheppard, Hartwick, & Warshaw, 1988).



FIGURE 3

Besides these theories or as complementary researchs, there are other approaches for individual acceptance fields of information technology (Agarwal, 2000), for example, the Theory of Planned Behavior (TPB) (Mathieson, 1991), the Decomposed Theory of Planned Behavior (DTPB) (Taylor & Todd, 1995), the Social Presence and Information Richness (SPIR) (Gefen & Straub, 1997), the Social Cognitive Theory (SCT) (Compeau, Higgins, & Huff, 1999) and the Diffusion of Innovations Theory (DOI) (Rogers, 1995). An excellent compilation of this issue can be revised at the Institute for Advanced Management Systems Research (IAMSR), in Finland (Han, 2003).

As a result of the literary review about this issue and applying multivariate analysis to confirm these results, the authors developed a model to evaluate citizen perception and

expectation.¹¹ With the model explained and based on expert judgment, hypothesis about perception and expectation were posted (Cardona, 2004).

At the perception issue, the model tried to explain that citizens consider that there is higher trust and satisfaction with electronic services than with traditionally delivered services.

Exp_Relacion Level of agreement with the phrase: In case of interaction with the Public Administration via Internet, I expect an excellent relationship

Ap Aptitude, citizens skills to use ICT in their relationship with the Public Administration

Ac Attitude, citizens disposition to use ICT in their relationship with the Public Administration

- C Trust
- R Relevance
- S Satisfaction

At the expectation issue, the hypothesis was based in the initial guess that citizens consider that the most desired interaction system with Public Administration is the electronic one, the most desired process is the procedure accomplishment, the most desired area is the employment one, and the most desired benefit on behalf of the citizen is cost reduction.

FINDINGS

Perception

Using confidence interval for trust, there is enough statistical evidence to conclude that the population represented by the sample considers that there is higher trust with elec-



FIGURE 4

Specific results of the research applied at the Colombian ambit, for the interested readers, can be found in http://dsi.esade.edu/ dcardona/tesis (July, 2005).

¹¹ The research demonstrates, that the citizen Perception and the Expectative towards its relationship with the Public Administration through the use of ICT can be evaluated via five (5) different independent and latent constructs, Attitude, Aptitude, Trust, Relevance and Satisfaction, under the effect of illustrative variables related to citizens, institutions and ambit in a model as formulated as follows.

With:

Per_Relacion Level of agreement with the phrase: I consider that the services offered by the Public Administration via Internet has improved my relationship with the Public Administration

tronic services than with traditionally delivered services. This conclusion is reinforced because the entire sub hypotheses set were validated. The population represented by the sample considers that the information transmitted has been confidentially managed, there is no violation of the personal privacy, the process has been secure, the result obtained electronically has been equivalent to the one obtained traditionally, and the process has been equivalent to the traditionally developed one.

On the other hand, using the confidence interval for relevance, there is enough statistical evidence to conclude that the population represented by the sample considers that the services provided by the Public Administration are the relevant ones. This conclusion is reinforced because the entire sub hypotheses' set was validated. The population represented by the sample considers that the process has been developed by an identifiable responsible, the Public Administration credibility has been improved, there has been higher perception of easy-to-use, Public Administration innovation has been improved, and integration among Public Administration agencies has been improved.

Additionally, using the confidence interval for satisfaction, there is enough statistical evidence to conclude that the population represented by the sample considers that there is a higher level of satisfaction with electronically delivered services than with traditionally delivered services. This conclusion is reinforced because 4 of the 6 sub hypothesis were validated. There is not enough statistical evidence to conclude that the population represented by the sample considers that electronic services are excellent, and that the time spent using electronic devices has been reduced, and that the costs also have been reduced, another findings is that there has been a Public Administration transparency increment, also that there is more information and that there has been a 24X7 Public Administration availability.

Expectative

Using the data obtained in the survey, it is possible to conclude that the sample surveyed considers that the most desired interaction system with Public Administration is "Vía WEB - email – Internet", but it is not possible to conclude that the sample surveyed considered that the most desired process is the procedure accomplishment.

On the other hand, it is possible to conclude that the sample surveyed considers that the most desired area is the employment and security the second one. The measurements of central tendency for the benefits expressed at the citizen expectative, show that the most desired benefit

on behalf of the citizen is the costs reduction.

Attention should be paid on the fact that in the perception analysis, the conclusions were about population represented by the sample because the methodology was the one of inferential statistics, based on hypothesis proves, using confidence intervals, mean differences or ANOVA, as in the last expectative hypothesis. For the other expectative hypothesis, the conclusions were about the surveyed sample because the methodology was of descriptive statistics based on percentage frequencies.

Characterization

The collected data and the proposed model allow a citizens' distribution in three different classes using a cluster analysis, the resultant classes are named as follows:

TABLE 1. Regression Coefficients Comparison

Coefficient	Perception	Expectative
Independent	3.376	3.508
Aptitude	-0.447	0.048
Attitude	0.229	0.232
Trust	0.041	0.051
Relevance	0.227	0.120
Satisfaction	-0.024	-0.062

 TABLE 2. Cluster identification

Name	Cluster	%
Propense	1	86.83
Adverse	2	11.43
Indifferent	3	1.74

As a general conclusion about perception, there is enough statistical evidence to conclude that the population represented by the sample considers that the ICTs impact their perception that the services offered by Public Administration via Internet have improved their relationship with Public Administration itself. In contrast, there is not enough statistical evidence to conclude that the population represented by the sample considers that in case of interaction with the Public Administration via Internet, they expect to have an excellent relationship.

CONCLUSIONS

As explained in the findings and based on the data processed at the

defined model, it is possible to conclude that electronic tax payment services implemented by the Peruvian government can be classified as an electronic government successful initiative at Latin America.

Following a user centered approach to the electronic government initiatives, a grater probability of success can be predicted, not only for the Peruvian case, also for Latin America.

It is important to highlight the political decision taken by the Peruvian government to change the traditional way to carry out this procedure at the Tax Office and the commitment of all the stakeholders related with the procedure, including the Tax Office employees (government), the banks (business) and the citizens.

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