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Analysis and Research of Administrative Approval Form Data Standardization

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Abstract. With the rapid development of Internet and big data, "Internet government service" has been valued by People of Republic China governments at all levels. Since 2008, Foshan City has begun to build an "administrative approval electronic network integration system", which has achieved remarkable results. However, in terms of data sharing and standardization, there are rooms of improvement. This paper takes the Foshan Natural Person Administrative Approval Form as an example for analysis and research, in order to highlight insight for standardization, and demonstrate standardized results by examples. It is expected to promote the digitization of e-forms and the sharing of e-government information in Foshan City.

1. Introduction

In recent years, with the rapid development of the Internet, "Internet-based Government service" has developed rapidly, and it has also received the attention of the State Council and governments at all levels. In September 2016, the State Council issued the " China to step up efforts to promote internet-based governance " Opinions (Guo Fa [2016] No. 55) [1]; In order to promote the construction of the government affairs platform, in July 2018, the State Council issued the " Govt to speed up integrated online service platform " (Guo Fa [2018] No. 27) [2], comprehensively improve the standardization and facilitation level of government affairs, and better provide full-process integrated online services for enterprises and the masses.

To achieve an integrated service platform, data sharing is key. However, e-government is still in isolation because of the barriers between inter-departmental e-government information resources, the backwardness of the original government information infrastructure, the limited access to resources, and the difficulty in maximizing the effectiveness of resource integration and utilization[3]. Some data can not be shared, the existing system can only realize the informationization of the government office process, and does not effectively analyze a large amount of data [4]. With the introduction of big data concept and rapid development, the application of big data has received widespread attention. Guizhou has taken the lead and achieved remarkable results [5, 6]. Hangzhou also made great efforts in big data government management and services[7]. The focus of big data reform is to break the “data island” [8], but for the form that the user fills in the administrative approval, it is still based on Word, Excel or other formats. After the user fills in the submission, the field data in the table cannot be extracted, resulting in the data can not be reused and shared. This paper will analyze and study the administrative

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approval form of natural persons in Foshan City, propose standardization rules and practice, and solve the problem of data isolation.

2. Form analysis

2.1. Total analysis

Before standardizing a form, you first need to analyze and understand the meaning of the form, understand the application context of the form and the corresponding administrative approval items. Only by deeply understanding the application scenarios of the approval items and forms, the meaning of the field can be accurately positioned and correctly understood in the form.

2.2. Carding additional materials

According to the instructions in the form, extract the additional materials needed. For example, if the designated representative or the agent can be a natural person or another organization; if the designated representative or the agent is another organization, a copy of the other organization's license should be submitted separately. And the documents of the specific manager and the identity document of the specific manager." If the agent is a natural person, an additional identity document must be submitted; if the agent is an organization, a copy of the organization's license and its assignment must be attached. And the document of the manager and the identity document of the specific manager.

2.3. Structure split

The content of the form is divided into two parts by nature: the form skeleton and the content. The form skeleton refers to the row, column structure and label text of the form, which serves as the basis for the field splitting and the basis of the field naming; the filling content refers to the specific content that the applicant needs to fill in, which serves as the basis for the field definition. For data with multiple records in the form, such as a resume, split the form in the form of a sub-table, and then divide the sub-table into two parts: the form skeleton and the filling content.

3. Form standardization rules

Based on the relevant national data standards, we propose the following standardization rules:

3.1. Serial number

For the content to be filled in the form (including the check items), all the information (data) that needs to be digitized is numbered sequentially from top to bottom and left to right, starting from 1 and represented by continuous natural numbers.

3.2. Internal identifier

That is, the internal identifier of the field, the encoding rule is "3 department (business) number + 3 digit form number + 3 digits of the code number". For a form, the first 6 bits of all fields are the same, and the last three bits are 0 to 3 bits for the sequence high.

3.3. Chinese name

Fill in the content for the form, and digitize the Chinese name of the corresponding field in the inventory storage time. Make sure that the field names in the form are unique to distinguish them from other fields, and you can briefly indicate the specific point (meaning) of the corresponding content in the field.

3.4. Data type and value domain

Data can be processed manually or automatically. Data types and value domain are used to represent the type of symbols, characters, or other representations of field data and a set of allowed values, including characters, numbers, logical, and enumeration, dates, binary, combination, and so on. The enumeration type and the combination type are determined according to specific circumstances, such

as a degree that can be represented by an enumeration, including a bachelor's degree, a master's degree, a doctor's degree; a time period can be represented by a combination, including two fields of a start time and an end time.

3.5. Data Format
The format requirements for field values specified from a business perspective. Field value data format definitions include: A = alphabetic characters; N = numeric characters; AN = alphanumeric characters; .. n = characters with a maximum length of n; .. ul = text of indeterminate length; ..p, q (p, q are natural numbers) = the longest p digits, q digits after the decimal point; YYYYMMDD = "YYYY" for the year, "MM" for the month, "DD" for the date, can be used in combination according to the actual situation. For example, N..17, 2 means the longest 17 numeric characters, two decimal places; A..20 means the longest 20 alphabetic characters.

3.6. Data Sources
An authoritative source channel (reusable channel) that specifies field data. For example, the education comes from the education department, the name comes from the pubic security department.

3.7. Object class
The boundaries and meanings can be clearly identified, and the characteristics and behaviors follow the same rules of the rules, abstract concepts, or collections of things in the real world. In short, the object class indicates the object class that the field data describes. Such as natural person, organization, item, etc.

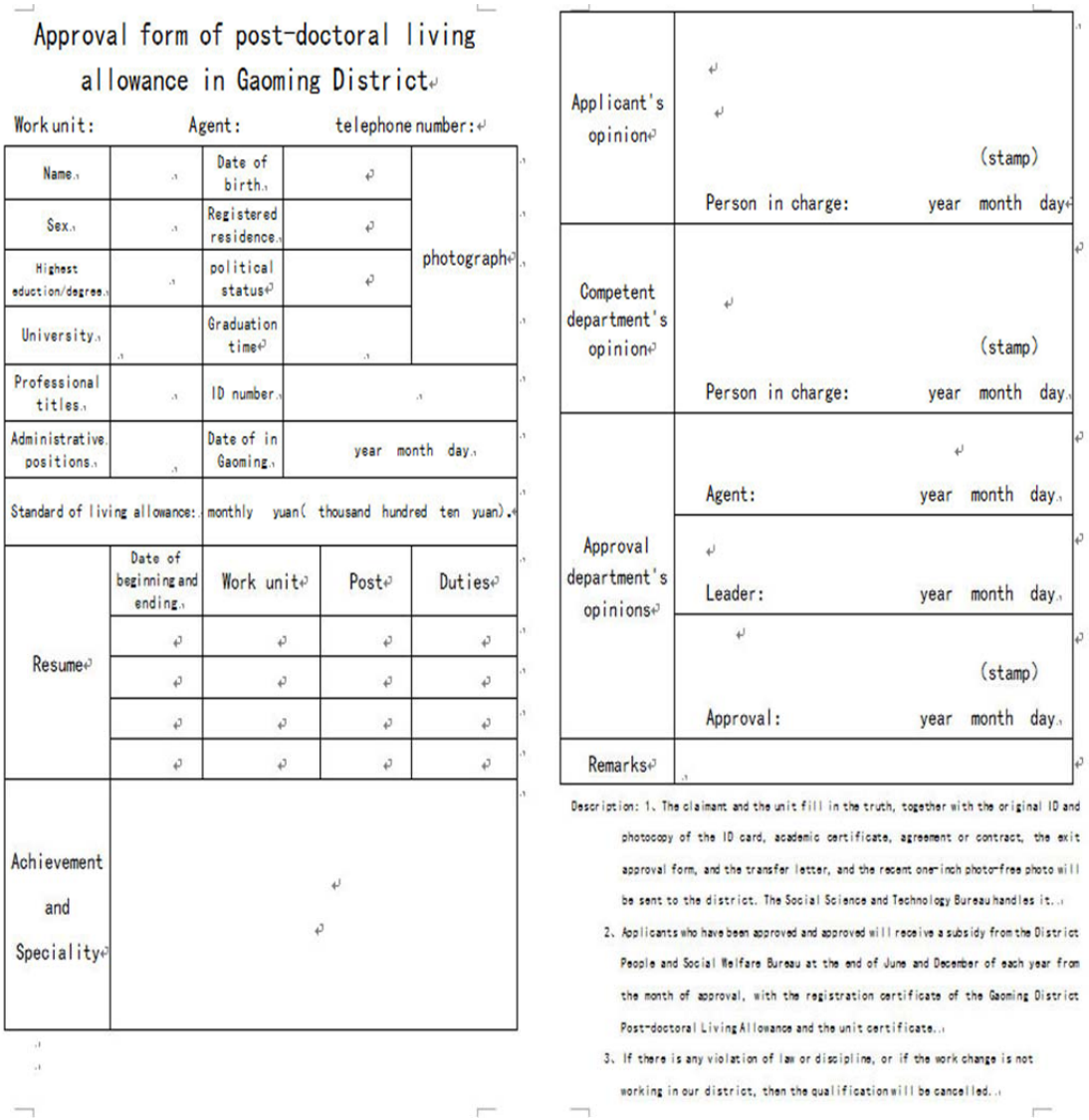
3.8. Characteristic word
A feature common to all members of an object class. Such as name, organization name, permission, etc.

3.9. Representation
A domain of values, a combination of data types, and, if necessary, a unit of measure or a character set. Such as name, picture, enumeration, description, etc.

3.10. Definition
The detailed definition of the Chinese name of the field, if the form is marked, should be as faithful as possible to the original form to mark the text content, and can be used as the annotation text and prompt text output by the future form generation tool.

3.11 Remarks
Make necessary descriptions of the object, content, or field value of the field description. Such as electronic signatures, signature pictures.

4. Example
The following is an example of the “Approval Form of post-doctoral living allowance in Gaoming District” of the Foshan Human Resources and Social Security Bureau No. 85, which standardizes and digitizes the form. The original form is shown in Figure 1.



Approval form of post-doctoral living allowance in Gaoming District

Work unit: Agent: telephone number:

Name		Date of birth		photograph
Sex		Registered residence		
Highest eduction/degree		political status		
University		Graduation time		
Professional titles		ID number		
Administrative positions		Date of in Gaoming	year month day	
Standard of living allowance:	monthly yuan(thousand hundred ten yuan).			

	Date of beginning and ending	Work unit	Post	Duties
Resume				
Achievement and Speciality				

Applicant's opinion	(stamp) Person in charge: year month day
Competent department's opinion	(stamp) Person in charge: year month day
Approval department's opinions	Agent: year month day
	Leader: year month day
	(stamp) Approval: year month day
Remarks	

Description: 1、The claimant and the unit fill in the truth, together with the original ID and photocopy of the ID card, academic certificate, agreement or contract, the exit approval form, and the transfer letter, and the recent one-inch photo-free photo will be sent to the district. The Social Science and Technology Bureau handles it.

2、Applicants who have been approved and approved will receive a subsidy from the District People and Social Welfare Bureau at the end of June and December of each year from the month of approval, with the registration certificate of the Gaoming District Post-doctoral Living Allowance and the unit certificate.

3、If there is any violation of law or discipline, or if the work change is not working in our district, then the qualification will be cancelled.

Figure 1. Original Form.

This form is used for post-doctoral applications for living allowances provided by the Gaoming District Government. The information includes basic personal information, resumes, performance and departmental opinions, and so on. According to the description in the table, the ancillary materials mainly include the original and copy of the ID card, academic certificate, agreement or contract, outbound approval form, transfer introduction letter, and the recent one-inch photo.

The resume in the form has multiple pieces of data, which are split into sub-tables. The skeletons in the original table and sub-tables are split according to the row, column structure and label text of the form, and the content is blank. According to the aforementioned standardization rules, the results of standardizing the form data are shown in Table 1. (To save space, only some representative fields are selected in the results).

Table 1. Results of the standardized application for approval form of the post-doctoral living allowance in Gaoming District.

SN	Internal identifier	Chinese name	Data type and value domain	Data Format	Data Sources	Object class	Character -istic word	Represen -tation	Definition	Remarks
1	012085 001	Work unit	Charac -ters	AN.. 120	personal fill	Organ iz -ation	work unit	name	work unit	Work unit of applicant
2	012085 002	Name	Charac -ters	A..30	police	natura l person	name	name	Surname and name of formal registration in household registration management department	Name of applicant
3	012085 003	Date of birth	Dates	YYYY MMDD	police	natura l person	date	date	Date of birth certificate and formal registration in household registration management department	Accord with calendar date of GB/T 7408, YYYYMM DD is basic format, YYYY-MM -DD is extension format
4	012085 004	Gender	Enumera -tion _gender	A..6	police	natura l person	gender	Enumera -tion	Basic physiological characteristics of person	enumeration _gender
5	012085 005	Registered residence	Combina -tion_ Register Address	Combin -ation	police	natura l person	registered residence	Combina -tion	registered residence	combination _Register Address
6	012085 006	Photograph	Binary	Photo	personal fill	natura l person	Photo -graph	photo	photograph	Photograph of applicant, scanning acquisition
7	012085 007	ID number	Charac -ters	AN..18	police	natura l person	ID	number	Only、 life-long unique identifier	ID number of applicant
8	012085 008	Standard of living allowance	Numbers	N..8,2	personal fill	item	amount of money	Measure -ment	Standard of living allowance	
9	012085 009	Resume	Sub-table _resume	Sub -table		item	resume	sub-table	Resume of applicant	012085ZB01 sub-table _resume
10	012085 010	Applicant's opinion	Charac -ters	AN..ul	personal fill	item	opinion	describe	Applicant's opinion	
11	012085 011	Person in charge of application unit	Binary	Photo	personal fill	item	autograph	photo	Autograph of person in charge	Scanning、 handwriting acquisition or electronic signature
12	012085 012	Stamp of application unit	Binary	Photo	personal fill	item	seal	photo	Stamp of application unit	Scanning, electronic seal or photo

The sub-tables are shown in Table 2 (selected parts), the Combination_Register Address is shown in Table 3, and the Enumeration_gender is shown in Table 4.

Table 2. Sub-table standardization results.

SN	Internal identifier	Chinese name	Data type and value domain	Data Format	Data Sources	Object class	Characteri-stic word	Represen-tation	Definition	Remarks
1	012085009-01	Date of beginn-ing and ending	Combina-tion_ times	Combin-ation	personal fill	natural person	times	Combin-ation	Resume time	Combina-tion_ times
2	012085009-02	Post	Characte rs	AN..30	personal fill	natural person	post	describe	Applicant's post in work unit	

Table 3. Combination_Register Address.

Serial number	Combination name	Data type and value domain	Data Format	Characteristic word	Representation
1	province	enumeration _ province	A..4	province	name
2	city	enumeration _city	A..20	city	name
3	county(area)	enumeration _county(area)	A..20	county(area)	name
4	town(street)	characters	A..20	town(street)	name
5	village	characters	A..20	village	name

Table 4. Enumeration_gender.

Enumeration name	Code	Enumeration value
Enumeration _gender	0	unknown gender
Enumeration _gender	1	male
Enumeration _gender	2	female
Enumeration _gender	9	unexplained gender

5. The next step of the job

The results of standardization in this paper are mainly used for the integrated platform for administrative approval. In order to continuously improve the data and maximize the sharing of data, the data needs to be further improved. The next step will continue to deepen the following work.

5.1. Combing enumerations and combinations

In the natural person approval form, there are many repeated enumeration and combination type fields. The next step is to extract all the public enumerations and common combinations in the combing process to achieve maximum reuse.

5.2. In-depth Investigation and research

For complex forms with strong professionalism, it is necessary to conduct in-depth Investigation and research on relevant business departments in order to accurately understand the administrative approval items and application scenarios corresponding to the forms, and correctly understand the meaning of each field. In addition, the current data source data is mainly based on personal understanding of the data, there may be certain errors, only through extensive Investigation and research can correctly understand the authoritative source of data, to ensure the accuracy and real-time data.

5.3. Research on the relationship between data

In the administrative examination and approval, the number of forms is high and the complexity is high. The relationship between the fields is complicated. In the context of big data, the traditional government mode has been difficult to meet people's basic needs and requirements. Combining the network to give full play to the interactivity and openness of e-government[9], clear the relationship between data can really promote the extensive application of big data in Foshan government services. The next step will be to build clear hierarchical relationships between fields and use Knowledge Graph to describe concepts and their relationships in the physical world in symbolic form [10], and use visualization techniques to display them. Mine, analyze, construct, draw and display data and the interrelationship between them.

6. Conclusion

Since the establishment of the “Administrative Approval Electronic Network Integration System” in 2008, Foshan has been continuously reforming and innovating, and is in the forefront of the development of national e-government. In 2018, the “Digital Government” construction plan issued by the Foshan Municipal Government (2018-2020) proposed to establish a unified data standard and data resource sharing platform. The implementation of this specification will help realize the implementation of data standards and sharing, and further promote the “Internet-based Government service” construction, and play a leading role in the country.

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References

[1] Information on http://www.gov.cn/zhengce/content/2016-09/29/content_5113369.htm
[2] Information on http://www.gov.cn/zhengce/content/2018-07/31/content_5310797.htm
[3] Meng Yuyu, Research on E-government Information Resources Sharing Model under the Background of Big Data [J], Henan Science and Technology, 2017(11): 29-30.
[4] MA Bai-yu, Leveraging e-government big data to promote the innovation and development of E-government [J], Electronic components and information technology, 2017, 1(2):10-12+51.

[5] N. Wang, Policy implications of big data development in developed countries and major regions of China, China Management Informationization, Vol.20(2017), No.4,159-160.
[6] Z.N. Mu, S.B. Du, On the Development Situation of Big Data in Guizhou Rural E-commerce and Its Measures, Value Engineering, Vol.35, (2016), No.8,38-39.
[7] N.G. Deng, Research on Government Management Service Innovation in Big Data Era, Journal of Tianjin Administration Institute, Vol.18(2016).No5,18-25.
[8] Y.X. Chen, The Second Information Revolution in Nanhai District of Foshan City, Decision-Making, Vol.23(2016)No.8,52-53.
[9] Zhang Xi, The Impact of Big Data on E - government and the Corresponding Tactics [J], China Computer&Communication, 2017(19):158-159.
[10] Liu Qiao, Li Yang, Duan Hong, Liu Yao, Qin Zhiguang, Knowledge Graph Construction Techniques[J], Journal of Computer Research and Development, DOI:10.7544/issn1000-1239.2016.20148228.53(3)582-600,2016.