



Non-economic benefits of standards

Jinan 12345 Public Service Hotline, China

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Table of contents

1	Objective and organization of the case study	3
2	Introduction to the Jinan 12345 Public Service Hotline	3
3	Attitude towards standardization by management and employees	4
4	Use of standards by the hotline service	5
5	Scope of the assessment and value chain analysis	5
5.1	Scope of the assessment	5
5.2	Value chain of the Hotline service	6
5.3	Value drivers	8
5.3.1	Service efficiency	8
5.3.2	Service quality	8
5.3.3	Service costs	8
6	General indicator system and method for evaluating the non-economic benefits of standards	8
6.1	Establishment of a general indicator system	8
6.2	Social benefits of standards	9
6.3	Evaluating non-economic benefits of standards	10
7	The application of standards by the Hotline service	11
8	Selection of key indicators to measure the impacts of standards	11
8.1	Establishment of an indicator system to assess the non-economic benefits of standards on the Hotline service	11
8.2	Selection of key indicators for primary activities in the value chain	16
8.2.1	Acceptance of enquiries	16
8.2.2	Processing of enquiries	16
8.2.3	Information dissemination	16
8.2.4	Follow-up enquiries	16
9	Evaluation of the non-economic benefits of standards	17
9.1	Approach to quantifying the non-economic benefits of standards for the primary activities in the value chain	17

9.2	Changes in non-economic benefits in all business functions of the value chain before and after the introduction of standards	19
9.2.1	Changes in service efficiency	19
9.2.2	Change in service quality	21
9.2.3	Change in service costs	23
10	Impacts of standards generating non-economic benefits	26
10.1	Analysis of the impacts of standards on service efficiency	28
10.1.1	Impact of standards on number of enquiries processed per person per day	28
10.1.2	Impact of standards on processing times per enquiry	28
10.1.3	Impact of standards on average man-hour work rate	28
10.2	Impact of standards on the service quality	29
10.2.1	Impact of standards on the rate of enquiries processed within time schedule	29
10.2.2	Impact of standards on expression and communication skills	29
10.2.3	Impact of standards on self-control	30
10.2.4	Impact of standards on service standardization	30
10.2.5	Impact of standards on complaints due to mistakes made by service staff	30
10.2.6	Impact of standards on problem solving ability	30
10.2.7	Impact of standards on learning specialized knowledge	31
10.2.8	Impact of standards on courteous behaviour	31
10.2.9	Impact of standards on service consciousness	31
10.2.10	Impact of standards on politeness	32
10.2.11	Impact of standards on the satisfaction of the public	32
10.3	Impacts of standards on service costs	32
10.3.1	Impact of standards on staff costs per 1 000 enquiries	32
10.3.2	Impact of standards on the equipment costs for 1000 enquiries	32
10.3.3	Impact of standards on the management costs for 1000 enquiries	32
11	Conclusions	33
11.1	Standards can ensure and contribute to improving the quality of services in general and generate social benefits for public services	33
11.2	The evaluation of non-economic benefits of standards should pay attention to a combination of quantitative and qualitative aspects	33
11.3	Public service organizations should strengthen their efforts towards standardization in order to increase service efficiency	34
11.4	Methodological suggestions for the evaluation of non-economic benefits of standards	34
	Annex 1 : References	35

1 Objective and organization of the case study

This case study was carried out on the public service hotline, Jinan 12345, in order to assess the non-economic benefits of standards. It was conducted between May and September 2013 in collaboration with Jinan 12345 Public Service Hotline, the China National Institute of Standardization, the Standardization Administration of the People's Republic of China and the ISO Central Secretariat.

2 Introduction to the Jinan 12345 Public Service Hotline

The Jinan 12345 Public Service Hotline, hereafter called "Hotline service" or simply "service", is a public enquiry service mainly for citizens of the city of Jinan, Capital of Shandong Province. The service provides information related to governmental or other public services and deals with complaints raised against the treatment or action by governmental agencies. The service is provided on a not-for-profit basis.

Based on the former "Public Telephone" service of the mayor of Jinan, a comprehensive upgrade and transformation of the service started on 26 September 2008. It is an open multi-functional public service hotline integrating 38 public governmental service hotlines, including the following: urban management (municipal, industrial and commercial); power supply and other services.

Since its opening, the hotline has received a total of 6.28 million calls from citizens, including 68 000 e-mails to the mayor's mailbox and 62 000 text messages as well as 3.76 million calls from outside of Jinan. More than 16 000 entries and 7 million words have been entered for all kinds of content in the knowledge base of the hotline system. The rate of resolution of issues is 97 %, the response rate 98 % and the satisfaction rate amounts to 100 %. At present, the hotline accepts more than

5 000 contributions daily and more than 20 000 on a busy day. The national and local TV have reported several times on the service which has gained increasingly in popularity. On 10 October 2012, the Hotline service passed a national audit organized by SAC making Jinan 12345 China's only national model of a standards-based innovative governmental agency implementing standards in services related to social management.

3 Attitude towards standardization by management and employees

1. Establishment of a standardization committee

A standardization committee was established inside the service, together with a standardization management office, and a Standardization Construction Program was prepared

2. Improvement of the operation system.

The basic administrative organization of the service was comprehensively based on standards, and a standardized service network was established

3. Establishment of a standards research team

The hotline named eight staff members with a certain theoretical knowledge and professional experience to form a standards system research group, to be fully responsible for establishing standards and to support the activities of the eight departments in the service

4. Consolidation of the work management.

The hotline service established standards-based management rules. It developed a standardized hotline planning process and an annual work plan, including a plan for the development and implementation of specific standards used by the service

4 Use of standards by the hotline service

The standard system of Jinan 12345 is based on:

- GB/T 24421.1, *Guidelines for Standardization of Organizations in the Service Sector – Part 1: Basic Requirements*
- GB/T 24421.2, *Guidelines for Standardization of Organizations in the Service Sector – Part 2: Standard System*
- GB/T 24421.3, *Guidelines for Standardization of Organizations in the Service Sector – Part 3: Drafting of Standards*
- GB/T 13016, *Principles and Requirements for Preparing Diagrams of Standard Systems*

Other standards used by the service are given in **Table 2** of section 8.1 of this report.

On the basis of applying the principles “simplification, uniformity, coordination and optimization” to the work of the hotline service, a system with comprehensive and basic standards was developed for the entire processes of the Hotline service.

5 Scope of the assessment and value chain analysis

5.1 Scope of the assessment

The scope of this assessment is the entire business process, involving seven business functions, which are as follows:

- Enquiry acceptance
- Enquiry processing
- Information dissemination
- Follow-up enquiry
- Operation management

- Information technology support
- Human resource management.

The service hotline has been using standards since 2012 to provide services for citizens. Even earlier, the concept and methods of standardization had been introduced, but were not fully implemented. Considering certain limitations in the availability of relevant data, this assessment covers the two years 2011 and 2012. 2011 represents the year before the standards were systematically introduced and 2012 the first year after the implementation. By comparing indicators for the two years, we will be able to identify those impacts that can be attributed to standards.

5.2 Value chain of the Hotline service

The primary activities of the service value chain are based on an information flow and can be described as follows: Input, processing, output and a feedback information flow (see **Figure 1**).

As mentioned under 5.1, the primary activities of the process consists of enquiry (by telephone, SMS, E-mail) acceptance, online consulting by the service staff and answering (direct settlement of an issue during the communication between staff and enquiring person), transfer of an enquiry (if an enquiry requires investigation or review), supervision, information dissemination, follow-up enquiry on the basis of the information provided and other components.

Support activities include human resource management (staff recruitment, staff qualification management, personnel training), information technology support, operation management (hotline operation management, acceptance center operations management), financial management and legal affairs management. The value chain of the hotline service is shown in **Figure 1**.

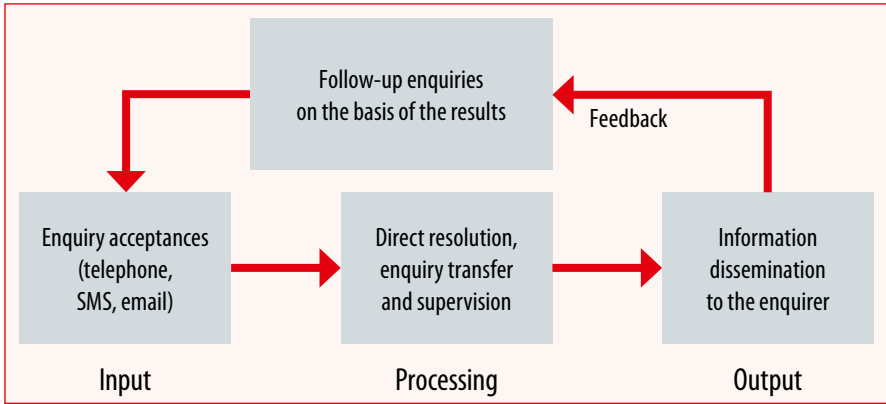


Figure 1 – Basic information flow in the activities of the Hotline service

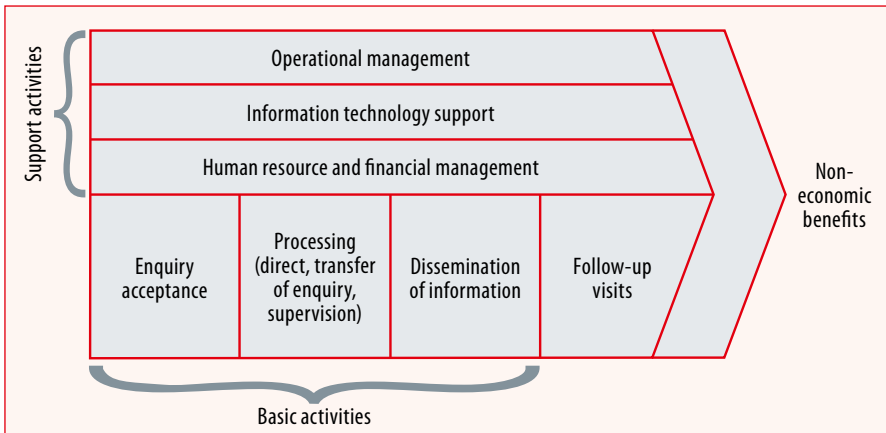


Figure 2 – Value chain of the Hotline service

5.3 Value drivers

This study considers service efficiency, service quality and service costs as the main value drivers of a public service organization which also apply to the Jinan 12345 Hotline Service.

5.3.1 Service efficiency

Efficiency of the Hotline service is reflected in the number of enquiries accepted per person per day, the average processing time for an enquiry and the work efficiency of involved staff. Additional indicators for service efficiency are given in **Table 2**.

5.3.2 Service quality

Service quality is the most important value driver of the Hotline service. It is reflected in the rate of timely resolved enquiries, the service level and the service attitude in the resolution and the customer satisfaction. Additional indicators for service quality are given in **Table 2**.

5.3.3 Service costs

Direct costs include human resources for the acceptance and processing of enquiries, equipment costs as well as management costs. Additional indicators for service costs are given in **Table 2**.

6 General indicator system and method for evaluating the non-economic benefits of standards

6.1 Establishment of a general indicator system

Benefits of standards can be reflected in the economy, society and the environment. Non-economic benefits of standards are the effects and benefits brought by standards to human society and the natural

environment. Social benefits of standards refer to the effects on and benefits for the society and environmental benefits of standards refer to the effects on and benefits for the natural environment.

Since the Hotline service has been established to serve society, the determination of social benefits of standards are the core of the assessment and environmental benefits are not addressed in this study.

6.2 Social benefits of standards

Social benefits involve various factors associated with social activities that are closely related to the social system. Compared with environmental benefits, the classification of social benefits is more complex. At present, there is no recognized and authoritative classification method in China or abroad for social benefits. Social benefits refer to benefits from science and technology, culture, social welfare, public interests, services of non-profit organizations and can be summarized as follows:

- 1. Science and technology:** Standards can contribute to inventions and patents
- 2. Cultural:** Standards can contribute to an improvement of the level of education and ethics of citizens
- 3. Social welfare:** Standards can contribute to improvements for the population in aspects such as income, health, employment, etc.
- 4. Public interests:** Standards can improve social order, public security, etc.
- 5. Services by non-profit organizations:** Standards can improve the service efficiency of non-profit organizations, improve service quality and reduce service costs

6.3 Evaluating non-economic benefits of standards

In this project, we will evaluate the non-economic benefits of standards based on the value chain approach and try to compare the situation before and after standards were implemented in the Hotline service. The steps in the assessment are as follows :

- **Step 1 :** The Hotline service is analyzed in the wider framework of the inputs it receives and the outputs it generates, i.e. the “industry value chain” of the service is determined, followed by an analysis of the value chain of the enterprise. The enterprise value chain is made up of a series of primary and support activities. The primary activities are the main business activities of the enterprise and reflect the value provided by the enterprise for the society. Support activities are ancillary and assist in the accomplishment of the primary activities.
- **Step 2 :** The impacts of standards are identified. The activities in the value chain to which standards contribute and generate social benefits, are identified in order to determine the scope and the focus of the assessment.
- **Step 3 :** Value drivers are analyzed. They are factors that give the organization a competitive edge and represent its core capabilities. They vary and depend on the organization and the industry.
- **Step 4 :** Indicators for non-economic benefit of standards. An indicator system for evaluating non-economic benefits of standards is determined according to characteristics of different industries and the indicators are assigned to specific locations in the value chain.
- **Step 5 :** Data concerning the defined indicators for the period before and after the introduction of standards are compared in order to understand the benefits generated by the standards. The impact of standards on the indicators for non-economic benefits are evaluated, calculated and then aggregated to final impact values.

7 The application of standards by the Hotline service

International, national, industry-sector and local standards are all standards developed by standards development organizations and are considered in this study. These standards are also referred to as “external” standards. Enterprise standards, which are developed by companies themselves are not addressed in this study, unless they are based on external standards.

8 Selection of key indicators to measure the impacts of standards

8.1 Establishment of an indicator system to assess the non-economic benefits of standards on the Hotline service

Through literature review, practical experience and discussion with the management and experts of the hotline service, an indicator system for the evaluation of social benefits was established, which mainly reflects efficiency, quality and costs of the service of this non-profit organization. Specific indicators are shown in **Table 1**.

Aspect	Value drivers	Level-1 indicators	Level-2 indicators	
Social benefits	Service efficiency	Number of enquiries handled per person per day		
		Time needed to handle an enquiry		
		Average man-hour work rate		
	Service quality	Rate of scheduled handling		
		Service level	Service skills	
			Service standardization	
			Business mistakes and responsibility complaints	
			Problem solving ability	
		Service attitude	Courtesy	
			Service consciousness	
	Polite language			
	Satisfaction			
	Service cost	Costs in staff for handling of 1000 enquiries		
		Equipment costs per handling of 1000 enquiries		
		Management costs per handling of 1000 enquiries		

Table 1 – Indicator system for evaluating the non-economic benefits of standards of the Hotline service

Definitions of each indicator used in the assessment study and their relationship with relevant standards are shown in **Table 2**.

#	Evaluation indicator	Definition of indicators	Standards related to the indicators
1	Number of enquiries handled per person per day	Average number of enquiries handled per staff per day	<ul style="list-style-type: none"> • DB21/T 1921.2-2011, <i>Service quality evaluation standard – Part 2: Acceptance</i> • DB31/T 511-2010, <i>Hotline service quality specification</i>
2	Time to process an enquiry	Average time to process an enquiry	<ul style="list-style-type: none"> • DB15/T 531-2012, <i>Governmental affairs service center management specification</i> • DB21/T 1921.2-2011, <i>Service quality evaluation standard – Part 2: Acceptance</i> • DB31/T 511-2010, <i>Hotline service quality specification</i>
3	Average man-hour work rate	$(\text{Call duration} + \text{busy hours}) / \text{working hours} \times 100\%$	<ul style="list-style-type: none"> • DB31/T 511-2010, <i>Hotline service quality specification</i>
4	Scheduled handling rate	Total number of enquiries handled as scheduled / total number of enquiries $\times 100\%$	<ul style="list-style-type: none"> • GB/T19580-2004, <i>Excellent performance evaluation standard</i> • GB/T 27060-2006, <i>Conformity assessment – Code of good practice</i> • GB/T19004-2011, <i>Quality management systems – Guidelines for performance improvements</i>
5	Expression and communication skills	Enquiry acceptance staff listen to and soothe the citizens, correctly guide, ask questions, explain, communicate and make appropriate summaries	<ul style="list-style-type: none"> • DB21/T 1921.2-2011, <i>Service quality evaluation standard – Part 2: Acceptance</i> • DB13/T 1473-2011, <i>Administrative (approval) service specification</i> • DB23/T 1485-2012, <i>Administrative service center service specification</i>
6	Self-control ability	Self-control of staff accepting an enquiry	<ul style="list-style-type: none"> • DB21/T 1921.2-2011, <i>Service quality evaluation standard – Part 2: Acceptance</i> • DB31/T 511-2010, <i>Hotline service quality specification</i>

#	Evaluation indicator	Definition of indicators	Standards related to the indicators
7	Service standardization	Use of standard Mandarin and of standard service terms	<ul style="list-style-type: none"> • DB31/T 511-2010, <i>Hotline service quality specification</i> • GB/T 27060-2006, <i>Conformity assessment – Code of good practice</i> • DB23/T 1485-2012, <i>Administrative service center service specification</i>
8	Mistakes by service staff resulting in complaints	Number of errors or complaints concerning business handling by enquiry acceptance staff	<ul style="list-style-type: none"> • GB/T 27060-2006, <i>Conformity assessment – Code of good practice</i> • DB31/T 511-2010, <i>Hotline service quality specification</i> • DB23/T 1485-2012, <i>Administrative service center service specification</i>
9	Problem solving ability	Citizens' acceptance and recognition of the results (The enquiry acceptance staff analyze and evaluate the problem expressed by the citizen, take relevant measures and assess a degree to which a specific service objective can be met, and put forward the solution.)	<ul style="list-style-type: none"> • GB/T 27060-2006, <i>Conformity assessment – Code of good practice</i> • DB31/T 511-2010, <i>Hotline service quality specification</i> • DB21/T 1921.5-2011, <i>Service quality evaluation standard – Part 5: The use of information</i>
10	Specialized knowledge ability	Knowledge and proficiency of the enquiry acceptance staff required for dealing with citizens' problems	<ul style="list-style-type: none"> • DB31/T 511-2010, <i>Hotline service quality specification</i> • DB21/T 1921.5-2011, <i>Service quality evaluation standard – Part 5: The use of information</i>
11	Courteous behaviour	Soothing and courteous voice of the enquiry acceptance staff	<ul style="list-style-type: none"> • DB23/T 1485-2012, <i>Administrative service center service specification</i> • DB23/T 1480-2012, <i>Administrative service standard system – Service standard system</i>
12	Politeness	Well spoken service language and avoidance of colloquial words. Professional training in courteous language shall be provided.	<ul style="list-style-type: none"> • DB23/T 1485-2012, <i>Administrative service center service specification</i> • DB23/T 1478-2012, <i>Administrative service standard system – Service quality standard system</i>

#	Evaluation indicator	Definition of indicators	Standards related to the indicators
13	Service consciousness	Consciousness of the staff that their job is to help citizens which is supported and done in accordance with relevant standards	<ul style="list-style-type: none"> • DB31/T 511-2010, <i>Hotline service quality specification</i>
14	Satisfaction	Satisfaction of the enquirer with the hotline service	<ul style="list-style-type: none"> • DB21/T 1921.1-2011, <i>Service quality evaluation standard – Part 1 : General requirements</i> • DB21/T 1921.3-2011, <i>Service quality evaluation standard – Part 3 : Customer perception quality evaluation</i> • DB21/T 1921.4-2011, <i>Service quality evaluation standard – Part 4 : Organization support quality evaluation</i>
15	Cost in staff for handling 1000 enquiries	Total annual cost of human resources / number of enquiries handled per year \times 1000	<ul style="list-style-type: none"> • DB15/T 531-2012, <i>Governmental affairs service center management specification</i> • DB21/T 1921.2-2011, <i>Service quality evaluation standard – Part 2 : Acceptance</i> • DB31/T 511-2010, <i>Hotline service quality specification</i>
16	Equipment costs per handling of 1000 enquiries	Total annual cost of equipment/ number of enquiries handled per year \times 1000	<ul style="list-style-type: none"> • GB 4943-2007, <i>Safety of information technology equipment</i> • DB21/T 1921.2-2011, <i>Service quality evaluation standard – Part 2 : Acceptance</i> • DB31/T 511-2010, <i>Hotline service quality specification</i>
17	Management cost for handling of 1000 enquiries	Total management cost of equipment/number of enquiries handled per year \times 1000	<ul style="list-style-type: none"> • DB15/T 531-2012, <i>Governmental affairs service center management specification</i> • DB31/T 511-2010, <i>Hotline service quality specification</i>

Table 2 – Evaluation indicators and related standards affecting the indicators

8.2 Selection of key indicators for primary activities in the value chain

8.2.1 Acceptance of enquiries

Value drivers related to acceptance include efficiency, quality and cost of service. Among them, service efficiency is measured by the number of enquiries handled per staff per day and the average man-hour work rate; service quality includes expression and communication skills, service standardization, control ability, problem solving ability, courtesy, polite language, service awareness and satisfaction; and service costs include staff, equipment and management costs per handling of 1000 enquiries.

8.2.2 Processing of enquiries

Processing also involves the same three value drivers efficiency, quality and cost of service. **Service efficiency** mainly includes the time for handling an enquiry and the average man-hour work rate; **service quality** mainly includes handling rate as scheduled, problem solving ability, specialized knowledge ability, standardized service, service awareness and satisfaction; and **service costs** mainly include staff equipment and management costs per handling of 1000 enquiries.

8.2.3 Information dissemination

Information dissemination involves the value drivers service quality and service costs. Service quality is mainly measured by the satisfaction of the enquirers; service costs include staff, equipment and management costs per handling of 1000 enquiries.

8.2.4 Follow-up enquiries

Follow-up enquiries only involve the value driver service quality and is measured by courteous behaviour, politeness, service awareness and satisfaction of the enquirers.

9 Evaluation of the non-economic benefits of standards

9.1 Approach to quantifying the non-economic benefits of standards for the primary activities in the value chain

The impacts of standards on the different indicators are not directly measured by staff of the Hotline service. Therefore, the following four weights have been defined, each of which is associated with a score (expressed by a number of points) as a numerical expression of the weight (see **Table 3**):

Weight/Degree of impact	Associated score
None	0
Limited	2
Moderate	4
Significant	6

Table 3 – Degrees of impacts in the weighting system and associated scores

The maximum total impact can be calculated as the number of indicators multiplied by 6 (=maximum score for an indicator). The impact following an assessment can then be expressed as a percentage of the maximum total impact. As an example: if there are 10 indicators, the maximum total impact is 60 points. If an organization receives 48 points, then it has obtained 80% (48/60*100) of the total. The following formula is used to calculate the impact of standards which can be expressed for each stage of the primary activities in the value chain.

$$\text{Impact (\%)} = \frac{\text{score 1 (for indicator 1)} + \text{score 2 (for indicator 2)} + \dots + \text{score n (for indicator n)}}{(n \times 6)} \times 100 \%$$

The degree of impact on each indicator of the value chain's primary activities is graded and assessed by several hotline service managers

according to their experience. The results of the impacts of the standards are shown in **Table 4**.

Business function in the value chain	Value drivers	Indicators	Degree of impact of standards on indicators	Degree of impact of standards on each business function
Enquiry acceptance	Service efficiency	Number of enquiries handled per person per day	4	73.33 %
		Average man-hour activity rate	6	
	Service quality	Expression and communication skills	6	
		Compliance of service with requirements	6	
		Ability for self-control	2	
		Problem solving ability	2	
		Courtesy	2	
		Polite language	6	
		Service consciousness	6	
	Service cost	Satisfaction of enquirers	4	
		Costs in staff for handling 1000 enquiries	Equipment costs for handling 1000 enquiries	
Management costs for handling 1000 enquiries			4	
Enquiry processing	Service efficiency	Processing time for one enquiry	6	70.83 %
		Average man-hour work rate	6	
	Service quality	% of enquiries processed within defined time limits	6	
		Compliance of service with requirements	4	
		Problem solving ability	2	
		Specialized knowledge ability	2	
		Service consciousness	4	
		Satisfaction of enquirers	4	
		Equipment costs for handling 1000 enquiries	Equipment costs for handling 1000 enquiries	
	Management costs for handling 1000 enquiries		4	

Business function in the value chain	Value drivers	Indicators	Degree of impact of standards on indicators	Degree of impact of standards on each business function
Information dissemination	Service quality	Satisfaction	6	50 %
		Costs in staff for handling 1000 enquiries	2	
	Service cost	Equipment costs for handling 1000 enquiries	2	
		Management costs for handling 1000 enquiries	2	
Return visit	Service quality	Courteous behaviour	4	75 %
		Polite language	4	
		Service consciousness	6	
		Satisfaction of the enquirer	4	

Table 4 – Impacts of standards on primary activities in the value chain

Standards affect all business functions in the value chain of the Hotline service. **Table 4** shows that the impact of standards on each business function in the value chain in descending order is: enquiry acceptance (73.33%), enquiry processing (70.83%), information dissemination (50%) and follow-on enquiry (75%).

9.2 Changes in non-economic benefits in all business functions of the value chain before and after the introduction of standards

9.2.1 Changes in service efficiency

1. Indicator: Number of enquiries handled per person per day

According to the hotline user statistics, before the introduction of standards in 2011, the number of enquiries during the whole year was 1 520 590. The average number of enquiries per day was 4 166. The hotline has a total of 60 operators work-

ing concurrently, which means that each operator accepted on average 70 enquiries per day. After the introduction of standards in 2012 the hotline was able to accept 1 778 855 enquiries during the year, which means that on average a total of 4 873 enquiries were processed per day without an increase of the operators. On average, each operator accepted 81 enquiries per day, which means that after the introduction of standards the number of enquiries accepted increased by around 17 %.

2. Indicator : Processing time per enquiry

Processing of enquiries includes direct processing as well as transfer of an enquiry if it cannot be resolved immediately. Direct handling means that the staff person can directly answer an enquiry, whereas transferring an enquiry means that it cannot be processed directly and needs to be transferred to a different department for response. Here the enquiry handling time refers to the average time required for handling each enquiry. Before the introduction of standards, the average handling of each enquiry was 10 to 15 days. After the introduction of standards, in 2012, the average processing of each enquiry required only 5 days which is a significant decrease.

3. Indicator : Average man-hour work rate

The average man-hour work rate refers to the percentage of time used for the processing of enquiries compared to the whole time of a working day. This indicator reflects the work efficiency of staff. The average man-hour work rate before the introduction of standards was at 75 %, and after the introduction of standards at 82 %, i.e. an increase of 7 %.

9.2.2 Change in service quality

1. Indicator: Compliance of processing time with allotted scheduled times

The compliance rate refers to the ratio in the number of enquiries handled as scheduled and the total number of accepted enquiries. The handling rate as scheduled before the introduction of standards was at 97.52 % and reached 98.44 % after the introduction of standards.

2. Indicator: Expression and communication skills

Expression and communication skills mainly means that the staff is able to listen and comfort the citizens, that it correctly guides them, asks questions, explains, communicates and is able to summarize the enquiry appropriately. Since the introduction of standards, expression and communication skills of enquiry acceptance staff have improved significantly.

3. Indicator: Self-control

Self-control refers to the ability of the enquiry acceptance staff to remain calm during the communication with an enquirer. Since the introduction of standards, the staff's self-control ability has significantly improved.

4. Indicator: Service compliance

Service compliance refers to the degree to which staff use standard Mandarin and standard service terms. Since the introduction of standards, the staff compliance rate has significantly improved.

5. Indicator: Complaints about mistakes for which service staff is responsible

This indicator refers to the number of complaints concerning processing mistakes by service staff. Before the introduction

of standards in 2011, there were over the whole year 65 such complaints. After the introduction of standards in 2012, there were 53 complaints.

6. Indicator: Problem solving ability

Problem solving ability means that the staff has the ability to analyze and assess problems expressed by citizens, take relevant measures and are able to suggest a solution. This indicator includes the acceptance by the citizens. Through the use of standards, the staff's problem solving ability has improved.

7. Indicator: Specialized knowledge

Specialized knowledge refers to the proficiency required of staff in order to handle the problems of the citizens, which has improved.

8. Indicator: Courteous behaviour

Courteous behaviour refers to the ability of staff to speak to enquirers with a soothing and understanding voice. This is also an ability that has improved through the use of standards.

9. Indicator: Service consciousness

Service consciousness means that the enquiry acceptance staff are aware that their job is to help the citizens. Through the use of standards, the service consciousness of the enquiry acceptance staff has indeed improved.

10. Indicator: Politeness

Politeness means that language in communications is appropriate and considerate. Professional training in language for enquiry acceptance staff is provided. Since using standards, the language politeness of the enquiry acceptance staff has indeed improved.

11. Indicator : Public satisfaction

Satisfaction refers to the satisfaction of the enquirer to the hotline service. A service satisfaction survey is conducted on each caller through a service quality evaluation software. According to available data, before the use of standards, citizens' satisfaction rate was 97.2 %. After use of standards, the citizens' satisfaction rate rose to 98.5 %, an increase of 1.3 %.

9.2.3 Change in service costs

1. Indicator : Staff costs to process 1 000 enquiries

Costs in staff are calculated as the average costs for processing 1 000 enquiries and can be calculated as follows :

Total annual cost of human resources/number of enquiries handled per year \times 1000. Total annual cost of human resources mainly includes annual salaries of personnel, training expenses, examination expenses and so on.

Comparison 2011 – 2012 for staff costs

In **2011**, the total annual cost of the hotline's human resources was as follows :

Salary per person was RMB 2,600 \times 12 (months) \times 150 (staff members) = a total of RMB 4.68 million. In 2011, the number of enquiries received was 1 520 590. Costs in staff for handling 1000 enquiries were :

$$(4680000 / 1520590) \times 1000 = \text{RMB } 3078$$

In **2012**, the total annual cost of human resources was payload per capita of RMB 2,600 \times 12 (months) \times 150 staff members = a total of RMB 4.68 million. In 2012, the number of enquiries accepted was 1,778,855. After using standards, staff costs for handling 1000 enquiries were :

$$(4680000 / 1778855) \times 1000 = \text{RMB } 2630$$

After the introduction of standards, costs in staff for handling 1000 enquiries were reduced by 14.55 %.

2. Indicator : Equipment costs for 1000 enquiries

Equipment costs per 1000 enquiries refers to the average equipment costs required for handling 1000 enquiries and can be calculated as follows :

Total annual equipment costs/number of enquiries handled per year \times 1000. Total annual equipment costs mainly include the investment in purchase of equipment and maintenance costs.

Comparison 2008 – 2012 for equipment costs

In **2008**, the hotline's investment in purchase of equipment was RMB 5.37 million with an additional investment of RMB 3.34 million the total investment amounted to RMB 8.71 million. Maintenance staff costs per year were RMB 14,000. Equipment costs after elimination of depreciation were RMB 7.782 million in 2011. The total number of enquiries processed throughout the year was 1 520 590. Equipment costs for processing 1 000 enquiries were :

$$(7782000 / 1520590) \times 1000 = \text{RMB } 5118$$

After using standards in **2012**, equipment costs after elimination of depreciation were RMB 6.614 million. The total number of enquiries accepted throughout the year was 1 778 855.

Equipment costs for handling 1000 enquiries were :

$$(6614000 / 1778855) \times 1000 = \text{RMB } 3718$$

After the introduction of standards, equipment costs for processing 1000 enquiries were therefore reduced by 27.35 %.

3. Indicator: Management costs per 1000 enquiries

Management costs of 1000 enquiries refers to the average management costs for processing 1000 enquiries, which can be calculated as follows:

Annual total management costs ÷ number of enquiries handled per year × 1000. Total management costs of the hotline mainly include salary, learning costs, research costs, travel expenses, etc. of management staff. In this case, management cost is expressed by the salary of management staff.

Comparison between 2011 and 2012 in management costs

Total management costs of the hotline service = management staff salary of RMB

$$2600 \times 12 \text{ months} \times 10 \text{ people} = \text{RMB } 312\,000.$$

In **2011**, before the use of standards, the number of enquiries handled was 1 520 590:

- Management costs for handling 1 000 enquiries =
 $(312\,000 / 1\,520\,590) \times 1000 = \text{RMB } 205\,183$

In **2012**, after the introduction of standards, the number of enquiries handled was 1 778 855:

- Management costs for handling 1 000 enquiries =
 $(312\,000 / 1\,778\,855) \times 1000 = \text{RMB } 175\,393$
(which amounts to a reduction of 14.6%)

10 Impacts of standards generating non-economic benefits

The analysis of changes in the non-economic benefits due to the introduction of standards shows that after the introduction of standards in 2012, all the indicators improved. However, an improvement in an indicator may be caused by the introduction of standards or may have other reasons. In order to distinguish the impacts of standards from other factors that may have affected the indicators, we conducted interviews with management and professional staff in the hotline service. The assessment method is similar to that explained in section 8.1. However, whereas we graded the impacts of standards using a scoring system (with 4 grades), we are now addressing the question as to what percentage standards contribute to the improvement of indicators. The results of this assessment are shown in **Table 5**. The information used for such an estimation is based on interviews with management of the hotline service and other professional staff. Since some of the indicators are based on qualitative impacts, it was not possible to arrive at a percentage contribution for all indicators. To better understand the information in **Table 5**, we use the first indicator as an example: We found that the number of enquiries increased by close to 17%. Based on estimation by staff in the hotline service, around 11% of the 17% increase can be attributed to the introduction of standards. This means that almost two-thirds (65%) of the improvements is perceived by staff as a result of the impacts of standards.

#	Key indicators	Change of the indicator after use of standards	Degree of impact	Corresponding score	Change in key indicators due to impact of standards
1	Number of enquiries handled per person per day	Increase by 16.97 %	Moderate	4	Increase by 11.31 %
2	Handling time of enquiry	10-15 days are reduced to 5 days	High	6	10-15 days are reduced to 5 days
3	Average man-hour work rate	Increase by 7 %	High	6	Increase by 7 %
4	Handling rate as scheduled	Increase by 1 %	High	6	Increase by 1 %
5	Expression and communication skills	Improved	High	6	Improved
6	Control ability	Improved	Limited	2	A certain degree of improvement
7	Service standardization	Improved	High	6	Improved
8	Business mistakes by staff resulting in complaints	Decrease by 10.77 %	High	6	Decrease by 10.77 %
9	Problem solving ability	Improved	Limited	2	A certain degree of improvement
10	Specialized knowledge	Improved	Limited	2	A certain degree of improvement
11	Courteous behaviour	Enhanced	Limited	2	A certain degree of improvement
12	Service consciousness	Improved	High	6	Improved
13	Politeness	Improved	High	6	Improved
14	Enquirer satisfaction	Increase by 1.3 %	Moderate	4	0.87 %
15	Costs in staff for handling 1000 enquiries	Decrease by 14.55 %	Moderate	4	9.70 %
16	Equipment costs for handling 1000 enquiries	Decrease by 27.35 %	Moderate	4	18.23 %

#	Key indicators	Change of the indicator after use of standards	Degree of impact	Corresponding score	Change in key indicators due to impact of standards
17	Management costs for handling 1000 enquiries	Decrease by 14.60 %	Moderate	4	Decrease by 9.73 %
Total		76 (of a maximum of 102 points = 100 %)			74.51 %

Table 5 – Impacts of standards on key indicators distinguished from other impacting factors

10.1 Analysis of the impacts of standards on service efficiency

10.1.1 Impact of standards on number of enquiries processed per person per day

Through in-depth training in the standard *Service Quality Evaluation Standard – Part 2: Acceptance*, the service staff have mastered special service skills resulting in a shortening of the duration of the average processing of an enquiry. The standard Hotline Service Quality Specification has been strictly implemented. Requirements regarding man-hour work rate, call duration, and service skills are incorporated into standards, making the service more standards-based and increasing the number of enquiries processed.

10.1.2 Impact of standards on processing times per enquiry

Standards make it easier to transfer enquiries to districts, counties and departments and reduce the time for the processing of transferred enquiries by defining deadlines for the processing of each enquiry.

10.1.3 Impact of standards on average man-hour work rate

This indicator has improved effectively by better processing skills of the service staff and reduction in lost time, thus improving the average man-hour work rate significantly.

10.2 Impact of standards on the service quality

10.2.1 Impact of standards on the rate of enquiries processed within time schedule

This indicator has improved mainly because of the implementation of the standards *Excellent Performance Evaluation Standard, Conformity Assessment – Code of Good Practice, Quality Management Systems – Guidelines for Performance Improvements*, and others, in the supervision of the hotline service and all its departments. The total number of enquiries processed keeps increasing and the number of enquiries processed as scheduled has risen.

10.2.2 Impact of standards on expression and communication skills

The indicators improved mainly for the following reasons.

- a) Through training in the standard *Service Quality Evaluation Standard – Part 2: Acceptance, Administrative (Approval) Service Specification, Administrative Service Center Service Specification*, and others, the expression and communication skills of the staff have significantly improved, and the defined work sequence is correctly followed and recorded;
- b) Through sorting and audit of work processes, sampling of recordings for analysis and other methods, quality inspection staff timely inspect the expression and communication skills of staff according to standards, which has resulted in significant improvements;
- c) On the basis of the standards, quality inspectors audit and test enquiry acceptance staff on an irregular basis, so as to effectively improve their communication skills.

10.2.3 Impact of standards on self-control

The main reason for an improvement in this indicator is that, after the implementation of the standard *Service Quality Evaluation Standard – Part 2: Acceptance and Hotline Service Quality Specification*, the enquiry acceptance staff has learnt to remain polite in accepting the caller's enquiries and deal with interference actively and effectively. With a positive and self-controlled approach, the service staff can provide correct guidance.

10.2.4 Impact of standards on service standardization

The indicator improved mainly due to systematic training in the standards *Hotline Service Quality Specification, Conformity Assessment – Code of Good Practice and Administrative Service Center Service Specification*, which require that the enquiry accepting staff speak Mandarin fluently and clearly without any dialect or accent. Communication according to these standards ensures that staff displays a professional attitude towards the caller which results in service improvement.

10.2.5 Impact of standards on complaints due to mistakes made by service staff

Through the implementation of relevant standards the capability of staff handling enquiries has improved significantly enabling them to seek solutions for the callers problems in line with the rules for the service.

10.2.6 Impact of standards on problem solving ability

Standards play a role mainly for the following reasons:

- a) Through the implementation of standards, specific requirements have to be respected with regard to problem solving. Service staff have the ability to decide to handle and solve a caller's problem directly through prompt responses, through involvement of other individuals (also called "tri-

partite conferencing”) or by transferring an enquiry to other bodies for investigation.

- b) According to the requirements in the standards, quality inspectors audit and examine the implementation of standards by the enquiry acceptance staff, and encourage them to actively improve their business attitude and enhance their problem solving ability.

10.2.7 Impact of standards on learning specialized knowledge

Standards promote the learning of key business knowledge – mainly through training in the standards *Hotline service quality specification and service quality evaluation standard – Part 5: The use of information*, so that enquiry processing staff master key business knowledge, relevant business processes and business rules.

10.2.8 Impact of standards on courteous behaviour

Standards are partly responsible for the change in this indicator. Having been trained on the basis of the standard *Administrative service center service specification* staff pay attention to how they speak (pronunciation, intonation, tone, stress, loudness, speed, etc.) in order to soothe the callers.

10.2.9 Impact of standards on service consciousness

The standards used clearly specify that enquiry acceptance staff have to be conscious of their service role when assisting citizens through the service. In particular, the implementation of the standard *Hotline service quality specification*, provides guidance to enquiry acceptance staff on how to handle questions and issues raised along the whole process from the start of the call through to solving the problem, which significantly increased their service consciousness.

10.2.10 Impact of standards on politeness

Standards have played a key role in improving this indicator. The main reason is that through the implementation of relevant standards, staff are able to use correct language and terms and demonstrate a professional attitude towards the callers.

10.2.11 Impact of standards on the satisfaction of the public

Using standards in the implementation of the service has resulted in an increase of its quality and the professionalism on the part of the enquiry acceptance staff, which in turn has resulted in an increase of the satisfaction rate of the public.

10.3 Impacts of standards on service costs

10.3.1 Impact of standards on staff costs per 1 000 enquiries

Staff costs for 1000 enquiries were reduced due to the use of standards which resulted in an increased number of calls processed by the same amount of staff. This was possible because standards have enabled staff to improve their work efficiency.

10.3.2 Impact of standards on the equipment costs for 1000 enquiries

Higher efficiency in equipment usage is due to an increasing number of enquiries being processed without any increase of investments in equipment.

10.3.3 Impact of standards on the management costs for 1000 enquiries

As for 10.3.2, the reduction in management costs for 1000 enquiries is due to treatment of an increasing number of enquiries with no change in salary or the number of management staff .

11 Conclusions

11.1 Standards can ensure and contribute to improving the quality of services in general and generate social benefits for public services

After the hotline service implemented standards, the indicators for service efficiency, service quality, service cost and other main value drivers showed visible improvements. In standardizing main aspects of the service, the processes, technology and experience gained by staff is documented. This form of codified collective knowledge of the organization remains therefore available within the organization even if a staff member leaves. Personal experience is converted into the wealth of the organization. Even when the work is done by a different person, owing to standards and the documentation of processes and requirements, the efficiency and quality of service remains the same, independent of the individuals who conduct the service.

11.2 The evaluation of non-economic benefits of standards should pay attention to a combination of quantitative and qualitative aspects

In general, the indicator system should cover various aspects, which are both quantitative and qualitative. Priority has been given in this assessment to a quantitative evaluation of indicators. However, due to the wide variety of social benefits and the complex phenomena of social services, many indicators could not be quantified directly. It was therefore unavoidable that some subjective indicators were applied in the evaluation whenever necessary. In this case study “non-economic benefits” of standards essentially mean social benefits. While certain indicators, such as efficiency and costs, can be quanti-

fied, this is not possible for many other indicators which should be subject to qualitative analysis.

11.3 Public service organizations should strengthen their efforts towards standardization in order to increase service efficiency

Standardization and the use of standards are vital for the development of public service organizations and can support improvements in the abilities and the quality of public service organizations.

11.4 Methodological suggestions for the evaluation of non-economic benefits of standards

Similar to the challenges in the assessment of economic benefits of standards, it is often difficult to distinguish between the impacts of standards and impacts of other factors on some of the selected indicators when one tries to evaluate social or non-economic benefits generated by standards. We therefore suggest that a comparative analysis applying multiple perspectives should be used in the evaluation of relevant indicators.

Annex : References

1. Zeithaml V A. Consumer perceptions of price quality and value : a means-end model and synthesis of evidence. *Journal of Marketing*, 1988, 52(07):2-22
2. Parasuraman, A. Reflections on gaining competitive advantage through customer value. *Journal of the Academy of Marketing Science*,1997,25(2):154-161.
3. Li Chuntian, Lecture 3 Standardization and Efficiency – The Ladder for the Development and Progress of Human Society, *China Standardization*, 2004,(3):69-73. 3.
4. Gronroos C. *Marketing in Service Companies*. Malmö Liber, 1983
5. Liu Chengyang, Li Han, Cao Lili, et al, *Introductory Theory of Service Standardization*. Beijing : China Standard Press, April 2009.
6. Li Shang, *Research on Public Service Standardization System and Evaluation Model*, Ph.D. Dissertation of China University of Mining, 2010.
7. Xu Lei, *Standardization Improves the Quality and Value of Public Service Quality and Standardization*, 2011,(1):29-32.

