

The Design and Implementation of Queue Management and Customer Service Mechanism in the Republic of Armenia

Petrosyan Rafayel M.

*Phd Student Faculty of Management, Public Administration Academy of the Republic of Armenia,
Lecturer of Armenian State University of Economics (Yerevan, RA)*

 <https://orcid.org/0009-0002-2218-4536>

rafa.tgm@outlook.com

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Հերթերի կառավարման և հաճախորդների սպասարկման կառուցակարգերի նախագծումը և կիրառման ուղղությունները ՀՀ-ում **Պետրոսյան Ռաֆայել Մ.**

Կառավարման ամբիոնի ասպիրանտ, Հայաստանի Հանրապետության պետական կառավարման սկսնակների, Հայաստանի պետական տնտեսագիտական համալսարանի դասախոս (Երևան, ՀՀ)

Ամփոփագիր. Հաշվի առնելով կառուցակարգերի նախագծման գիտական մոտեցման պոտենցիալը ոչ միայն վաճառքի և ռեսուրսների բաշխման, այլ նաև կազմակերպություններում գործընթացների նախագծման և բարելավման համար՝ սույն հոդվածում ուսումնասիրվեց հաճախորդների սպասարկման և հերթերի կառավարման ոլորտը: Դրա նպատակը այնպիսի արդյունավետ կառուցակարգ նախագծելն է, որը կազմակերպությունները կարող են կիրառել հերթերի արդյունավետ կառավարման համար: Ուսումնասիրվել է ՀՀ-ում հաճախորդների սպասարկման և հերթերի կառավարման ոլորտը, վեր են հանվել շուկայում գործող երեք հիմնական մոդելները՝ ներքին սպասարկման, աուտսորսինգային և համակցված: Բացահայտվել են շուկայում գործող մոդելների առավելություններն ու թերությունները: Վեր են հանվել նաև աուտսորսինգային և համակցված մոդելներում գործող վճարման մոդելները: Համախմբվել են այն էական ցուցանիշները, որոնք անհրաժեշտ է վերահսկել հերթերի արդյունավետ կառավարման համար՝ գնահատելով ցուցանիշների ազդեցությունը կազմակերպությունների վրա: Վերջապես, նախագծվել է հաճախորդների սպասարկման և հերթերի կառավարման արդյունավետ կառուցակարգ, որը ՀՀ-ում գործող և օտարերկրյա կազմակերպությունները կարող են կիրառել հերթերի սպասարկում իրականացնելիս:

Հանգուցաբառեր և բառակապակցություններ՝ Հերթերի կառավարում, հաճախորդների սպասարկում, գործառնական արդյունավետություն, բիզնես գործընթացների աուտսորսինգ, սպասարկման մոդելներ, կատարողականի ցուցիչներ, կառուցակարգերի նախագծման տեսություն, վճարման մոդելներ, տվյալների վրա հիմնված որոշումների կայացում

Разработка и внедрение механизма управления очередями и обслуживания клиентов в Республике Армения **Петросян Рафаел М.**

*Аспирант кафедры управления, Академия государственного управления Республики Армения,
Преподаватель Государственного экономического университета Армении (Ереван, РА)*

Аннотация. В данной статье исследовалась сфера обслуживания клиентов и управления очередями, учитывая потенциал научного подхода к дизайну механизмов не только для продаж и распределения ресурсов, но и для проектирования и улучшения процессов в организациях. Цель статьи заключалась в разработке эффективного механизма, который организации могут применять для управления очередями. Была проанализирована сфера обслуживания клиентов и управления очередями в Республике Армения, в результате чего были выделены три основные модели, действующие на рынке: внутренняя, аутсорсинговая и комбинированная. Были определены преимущества и недостатки моделей, функционирующих на рынке. Кроме того, были выявлены модели оплаты, используемые в аутсорсинговых и комбинированных моделях.

Были консолидированы основные показатели, которые необходимо контролировать для эффективного управления очередями, с оценкой влияния показателей на организации. Таким образом, был разработан эффективный механизм обслуживания клиентов и управления очередями, который могут использовать организации, действующие в Республике Армения и за рубежом при управлении очередями.

Ключевые слова и словосочетания: управление очередями, обслуживание клиентов, операционная эффективность, аутсорсинг бизнес-процессов, модели обслуживания, показатели эффективности, теория дизайна механизмов, модели платежей, принятие решений на основе данных

Introduction

Queue management has become a critical component of operational efficiency and customer satisfaction in modern organizations. The growing demand for improved service delivery has increased the need to implement effective queue management mechanisms, especially in industries such as customer service, healthcare, banking, retail, transportation, and public services [1, pp. 1-45].

Queue management refers to the systematic organization of the flow of customers or requests within a system and is aimed at reducing customer waiting times, improving the customer service experience, and making efficient use of resources. Queue management plays an important role, especially in industries where many customers are involved and time is an important factor [2, pp. 208-227]. As a result of implementing effective queue management mechanisms, organizations can expect:

- **Increased operational efficiency.** Proper allocation of resources in efficient mechanisms leads to increased productivity and reduced availability time [3].
- **Improved customer experience.** Shorter wait times and higher quality service lead to increased customer satisfaction.
- **Data-driven decision-making.** Modern queue management systems contain important information about customer behavior and barriers to providing quality service.

The aim of the article is to analyze queue management standards and best practices, study queue management processes implemented in large organizations, and based on the analysis, design a queue management mechanism that can be used by organizations engaged in queue management, increasing the efficiency and quality of the process. To achieve the goal, the following problems have been set:

- study the main operating models in the customer service and queue management market, identify their advantages and disadvantages,
- consolidate the indicators necessary for effective queue management, which need to be monitored,

- study the payment models operating in customer service and queue management outsourcing organizations and assess the impact of the observed indicators on the organization in the case of each model,

- Design an effective customer service and queue management mechanism that can be used by organizations operating in Armenia and abroad that provide queue management services.

Analysis

In global practice, there are 3 main models of customer service provision: internal customer service, customer service outsourcing and a combined model. In Armenia, the internal customer service model is mainly used: organizations provide, organize and manage customer support services using their own resources. In global practice, customer service outsourcing and combined models are more common. Organizations that need to provide customer support services often hire BPO (business process outsourcing) organizations that provide customer service. Within the framework of combined models, organizations perform some customer support functions using internal resources, while they also hire outsourcing organizations to perform some functions. There are two large BPO organizations operating in Armenia: German CMX Solutions and French Teleperformance. However, these organizations provide services not to organizations operating in Armenia, but to foreign organizations. BPO organizations operating in Armenia mainly provide services to foreign organizations, while in local organizations, service is provided using the internal service model. Although the internal customer service model provides high control over processes and quality, it also has a number of disadvantages, such as high operating costs, the complexity of technology updates, inefficient use of resources, low-quality service provision, etc. Meanwhile, BPO organizations, being specialized in a given field, are able to effectively solve these problems focusing only on their core operations [4].

Table 1. *Advantages and disadvantages of the internal service model*

Advantages	Disadvantages
Full control of processes and quality	High operating costs
Direct supervision of the team	Difficulties with scaling during peak seasons
Alignment with the organization's values and culture	High costs of technology upgrades and implementation
Opportunity for direct collaboration between employees	Overload in case of increased customer flow
High level of data security	High dependence on internal resources

Table 2. *Advantages and disadvantages of the outsourcing model*

Advantages	Disadvantages
Cost reduction	Risk of losing control of processes
Access to specialized teams and technologies	Language and cultural barriers
Rapid scaling opportunities	Data security risks
24/7 customer service availability	High dependence on external suppliers
Greater focus on core business processes	Risk of declining customer satisfaction in the absence of quality control

Table 3. *Advantages and disadvantages of the combined model*

Advantages	Disadvantages
Flexibility of operations and the team	Coordination complexity
Cost reduction through outsourcing of non-core functions	Lack of clear boundaries of responsibility
Maintaining control over important functions	Cultural and linguistic differences
Team engagement	Complexities of integrating new processes

Although there are different models in the market, the process of queue management is the same across all models. Customer service organizations receive an incoming volume. The volume is the total number of requests, customers, calls, applications, and, depending on the industry, other transactions (hereinafter referred to as requests) that the organization needs to handle. Of course, there are requests that have been terminated within the incoming volume. These include requests that have been terminated by the customer or the system before or during the interaction with a customer service expert (hereinafter referred to as the expert). The difference between the incoming volume and the terminated requests is the handled volume. It includes the total number of requests that have been handled by the organization's experts. Obviously, the handle time for each request is different, but by looking at the handle time for each request, we can calculate the average handle time (AHT), which includes the time spent talking, waiting, and after call work. In some cases (e-mail, chat), experts serve requests simultaneously, in which case the ratio of simultaneously handled requests can be calculated (concurrency rate). In this case, the average duration of handling requests decreases, since requests are handled simultaneously. The average duration of request handle time can be recalculated by dividing the average duration of request handling time to the concurrency rate. The total handle time (transaction hours) can be obtained by the product of the handled volume and the average handle time. The period of time when an expert is ready to accept a request, but is waiting for the request, is called availability time.

By adding available time to the handle time, we can obtain an indicator called productive time. During productive time, the expert is ready to

handle or is handling requests. It is obvious that the entire working time of the expert cannot be productive. In some cases, the expert is in the office, but is not ready to serve requests during non-productive office time. Non-productive office time, which is also called in office shrinkage time, includes time spent on breaks, administrative operations, training, system or technical problems, etc. By adding non-productive office time to productive time, we can obtain the present hours, the total time the expert is present in the office. In some cases, there are unplanned absences in the organization (absences, delays, early termination of work, unplanned holidays, unplanned or longer breaks than planned, etc.), which, by adding to the present hours, we can obtain the scheduled hours by the organization. Of course, in addition to unplanned absences, there are also planned absences in the organization, such as vacations. The sum of scheduled hours and planned absences is called scheduled hours gross.

Based on the designed and proposed mechanism for queue management, we have also identified the ratios that need to be calculated and monitored [5, pp. 135-143].

As a result of the comparative analysis of BPO (business process outsourcing) organizations and the application of the methodology of mechanism design theory, we have also identified possible contractual models for effective cooperation between organizations in the case of customer service outsourcing and combined models. These models show how and for what are the organizations paying to the BPO companies outsourcing organizations [6, pp. 241-256].

Table 4. Indicators needed for effective queue management

N:	Indicator	Formula
1	Handled volume rate	= handled volume / incoming volume
2	Abandon rate	= abandoned transactions / incoming volume
3	Availability rate	= available hours / production hours
4	Occupancy	= transaction hours / production hours
5	In-office shrinkage rate	= in-office shrinkage hours / present hours
6	Unplanned out-office shrinkage rate	= unplanned out-office shrinkage hours / scheduled hours net
7	Planned out-office shrinkage rate	= planned out-office shrinkage hours / scheduled hours gross
8	Efficiency	= transaction hours / present hours

Table 5. Indicators needed for effective queue management

N:	Indicator	Formula
1	Productive hours	= Transaction hours / (1 – Availability rate) or = transaction hours / Occupancy rate
2	Present Hours	= productive hours / (1 – In-office shrinkage rate)
3	Scheduled Hours	= present hours / (1 - Unplanned out-office shrinkage rate)
4	Gross scheduled hours	= Scheduled Hours / (1 - Planned out-office shrinkage rate)

1. **Transaction model.** In this model, the organization pays the outsourcing company for the requests handled (request price multiplied by the number of requests handled). Contracts can specify the types of requests that are considered paid, penalties for not serving a minimum set number of requests, etc.

2. **Transaction hours model.** Within this model, the organization pays the outsourcing company for provided transaction hours (price per transaction hours multiplied by transaction hours).

3. **Production hours model.** Within this model, the organization pays for productive time (price per productive hour multiplied by productive hours).

4. **Present hour model.** Under this model, the organization pays for the present hours (price per present hour multiplied by present hours).

5. **FTE model (full time equivalent model):** Under this model, the organization pays for FTEs working in the project (price per FTE multiplied by the total FTEs included in the project).

In addition to the above-mentioned main payment models, we have also identified other models that are used in the market, such as payment per unit of sale in sales-oriented projects, payment per amount collected in collection projects, payment per desk or computer, payment per project or portfolio of projects, etc. It is noteworthy that in the case of each model, different factors directly affect the revenue and cost of the outsourcing organization (see Table 6, Table 7).

Table 6. Factors affecting the revenue of the organization

PAYMENT MODEL	AHT	AVAILABILITY RATE	IN-OFFICE SHRINKAGE	OUT-OF-OFFICE SCHRINKAGE
1	Yes	Yes	Yes	Yes
2	-	Yes	Yes	Yes
3	-	-	Yes	Yes
4	-	-	-	Yes
5	-	-	-	-

Table 7. Factors affecting the costs of the organization

PAYMENT MODEL	AHT	AVAILABILITY RATE	IN-OFFICE SHRINKAGE	OUT-OF-OFFICE SCHRINKAGE
1	Yes	Yes	Yes	Yes if paid
2	-	Yes	Yes	Yes if paid
3	-	-	Yes	Yes if paid
4	-	-	-	Yes if paid
5	-	-	-	-

Conclusions and recommendation

This study explored the design and application of queue management and customer service mechanisms in the Republic of Armenia. The research identified three key operational models in the industry: internal service, outsourcing, and combined models, each with its distinct advantages and disadvantages. The study also examined different payment models used in outsourcing and hybrid customer service arrangements and analyzed essential performance indicators that organizations should monitor for efficient queue management.

Key findings of the article include:

- The internal service model, although providing full control over operations and quality, is associated with high operational costs and scalability challenges.
- The outsourcing model offers cost efficiency and access to specialized expertise but presents risks related to data security, cultural barriers, and control loss.
- The combined model balances control and flexibility, yet poses coordination and integration challenges.
- Various contractual payment models (e.g., transaction-based, hourly-based, or FTE-based) impact both the revenue and costs of service providers and must be strategically selected based on organizational needs.
- Essential performance metrics (such as handled volume rate, availability rate, and efficiency) were consolidated to provide a structured approach for organizations aiming to optimize queue management.
- By integrating elements from mechanism design theory, the study proposed an optimized queue management mechanism that enhances operational efficiency and customer satisfaction while ensuring financial sustainability.
- Considering all the factors discussed in the article, it is recommended to implement the designed queue management mechanism in companies in RA and abroad for efficient management of queue.

Literature

1. **Gross, D., Harris, C. M.** Queuing Theory Fundamentals. // Wiley, 1998, 3rd ed., pp. 1-450.
2. **Frei, F. X., Harker, P. T.** Measuring Service Performance: Analyzing Call Center Operations. // Manufacturing & Service Operations Management, 1999, vol. 1, no. 2, pp. 208-227.
3. **Koole, G.** (2013). Call Center Optimization: Simulation and Performance Evaluation of Call Centers. Springer.
4. **Fitzsimmons, J. A., Fitzsimmons, M. J.** Service Management: Operations, Strategy, Information Technology. // McGraw-Hill, 2019, 9th ed.. – 560 p.
5. **Mehrotra, V., Fama, J.** Call Center Simulation Modeling: Methods, Challenges, and Opportunities. // Proceedings of the Winter Simulation Conference, 2003, pp. 135-143.
6. **Lacity, M. C., Willcocks, L. P.** Global Outsourcing of Business Processes: A Two-Stage Approach. // Journal of Operations Management, 2001, vol. 19, no. 2, pp. 241-256.

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