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Mathematical Application of the Characteristics of the System of Economic Security of Enterprises

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Mathematical Application of the Characteristics of the System of Economic Security of Enterprises

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Abstract. Currently, the issues of ensuring the economic growth of the enterprise are coming to the fore. The economic growth of the enterprise is affected by the overall economic situation in the world and in the state, in particular. We have defined as the object of the study a regional organization - LLC "New Contact", whose subject of study was the system of economic security by the type of controllability. The generally accepted standards of controllability for line managers, along with the characteristics and tasks of employees, are considered. We have presented the developed program Verint, which focuses on controlling employee discipline within the company LLC "New Contact". The modules of economic security for the organization are described in detail: the module for managing employee profiles and the module for tracking employees. All this increases the transparency of the work of employees and the entire team, making it possible to enhance the effectiveness of the team management system.

INTRODUCTION

The main goal of the economic security of the enterprise is to ensure sustainability and maximum effective functioning, as well as to ensure a high potential for the development and growth of the enterprise in the future. The most effective use of corporate resources of the enterprise is necessary to fulfill business goals, achieved by preventing threats of negative impacts on the economic security of the enterprise, as well as achieving the main functional goals of the economic security of the enterprise.

Recently, the matters of ensuring the economic advancement of an enterprise are gaining priority. The economic growth of an enterprise is influenced by the general economic situation in the world and, in particular in the state. The economic situation of the state, apart from a number of other factors, depends on the ability of the relevant government agencies to ensure both the economic security of the state and economic entities – enterprises [1]. Russian companies and organizations are continuously being impacted by numerous internal and external threats [2]. Countering economic offenses at the enterprise entails the creation of a multi-purpose management system, as well as the use of more advanced technologies in decision - making.

The economic security system of each enterprise is strictly individual. The efficiency of the selected system largely depends on the legislative framework available in the state, the technical, material and financial resources allocated by the head of the enterprise, and each employee's realizing of the significance of ensuring business security [3], in addition to, the comprehension and hands-on experience of the head of the economic security system, who is closely associated with in establishing and sustaining the system in a functional state) [4].

The primary aim of the economic security of the enterprise is to guarantee steadiness and optimal efficient functioning, as well as to ensure high potential for the improvement of the enterprise in the long term.

The object of the research is a local corporation, and the subject of the study is the system of economic security in terms of manageability.

MATERIALS AND METHODS

The norm of manageability is the number of people who are directly managed by the head and directly subordinate to him. The optimal handling rate is: 3-5 people. This is due to the peculiarity of human RAM, which can store information about an average of three to five unrelated objects.

TABLE 1. Generally accepted standards of manageability of line managers

Type of production	The complexity of the product	Management level	
		(SV)	(RG)
Mass and large-scale production	Complex and simple	15	5
	Especially difficult	11	4
Serial production	Complex and simple	13	5
	Especially difficult	9	4
Individual and micro-serial production	Complex and simple	11	4
	Especially difficult	7	3

Based on the generally accepted standards of manageability and depending on the project's complexity, the norm for employees of the company "New Contact" LLC line managers represented by SV and RG corresponds to established standards (Tab. 1):

1 SV per group of employees numbering 15 people;

1 RG for a group of 3-5 people, 1:45 for ordinary employees;

For each employee, regardless of their position and division, functional responsibilities have been developed and approved, which are documented in their job descriptions.

The functional responsibilities of the SV include daily, weekly, and periodic tasks for which, in accordance with the established target values, the rate of hours spent per month is calculated [5]. Overall, for all tasks, the standard hours must align with the production calendar. Planning occurs daily on the part of the team leader and, if necessary, is adjusted to meet production plans (Tab. 2).

TABLE 2. Weekly tasks of employees

Weekly	The norm per week for a group of SV in the amount of 15 people	The norm of hours
Holding meetings and planning meetings with your group	30 minutes	4
Informing and training operators of minor changes in the project. Monitoring the availability of the necessary tools for the operators to work and answering the operators' questions	30 minutes	4
Formation and provision of daily reports on your group	60 minutes	4
Total for the weekly tasks of SV		12

The fulfillment of periodic tasks depends on the transfer of new operators to the SV group, and the instructions of the RG (Tab. 3).

TABLE 3. Periodic tasks of employees

Periodic	The norm of hours
Organization and control of the mentor's activities when working with new specialists	2.5
Organization and control of the mentor's activities when working with new specialists	2
Operator training in the AWP program and familiarization with the checklist	2
Implementation of settings for operator accounts (connection/disconnection of skill groups), in accordance with the tasks set by the RG	2
In total, it is spent on periodic tasks of SV per month	8.5

In total, on average, 168 hours per month are spent on performing the functional duties of SV of a group of employees in the number of 15 people, which corresponds to the average rate for the year in the production calendar (Tab. 4).

TABLE 4. Time spent on completing tasks (per month)

The tasks of SV	The rate of hours per month
Daily tasks of SV	147.5
Weekly tasks of the SV	12
Periodic tasks of SV	8.5
Total per month	168

Rules for calculating the Ratio for Project Team Leaders.

In the project structure, supervisors report to the Head of the group. The optimal rate of manageability for complex and simple projects is 4-5 SV, and for particularly complex projects, it is 2-3 SV. In terms of Ratio, this equates to 1:45 for operators.

The distribution of projects by complexity level is formed in accordance with the product matrix and the categories of project complexity (considering the volume and complexity of the project's information part, the duration of training, a large volume of daily/weekly information updates, and the number of product lines in customer service) [6], [7].

In the functional direction, the team leader performs a number of tasks related to:

- Project Administration;
- Ensuring the goals and objectives of the project;
- Managing internal operational KPIs;
- Ensuring the fulfillment of contractual obligations and customer quality indicators;
- Controlling accounting management [8], [9].

Additionally, the head of the group is the designated person responsible for the project work on-the site, performs all administrative functions for the project, and is fully accountable for the project's success on-site, as its representative.

To perform additional "unique" functional tasks aimed at the development of a specific direction or project, the Ratio for both the RG and the SV can be revised downwards concerning of the norm of controllability.

For other employees, the Ratio calculation rules are similarly formed according to functional tasks and the structure of subordination in line with generally accepted standards of manageability for line managers [10].

"Ready" is an indicator that displays the production and processing of employees concerning their rate according to the production calendar.

The main reasons for the deviation [11] include:

- Unpredictable workload increases;
- Insufficient internal communication with employees;
- Employees not adhering to set break times;
- Arbitrary status settings: "feedback/meeting/mentor/technical reason";
- Malfunctions in the customer's software/service;
- Reduced workload due to frequent training withdrawals.

Operational measures to correct the indicator include:

- Check the compliance of breaks by WFM (tracking-compliance-quick view), to bring back employees who are on break not according to schedule;
- Cancelling all training and educational events;
- Rescheduling for the following day and offering part-time jobs;
- Taking employees into training and holding meetings, OS, and SBS;
- Conducting a disciplinary conversation with an employee and documenting his working day in a status breakdown - time. Entering information in the violation log;
- Planning monitoring of employees' work activities;
- Verbally informing the on-duty administrator;
- Submitting a request to ITSM to rectify the situation and informing the RG;
- Analyzing how many "phantoms" were registered in the program and calculating the indicator without including the phantoms or reducing their count;
- Review the load forecast;
- Coordinate with the MP on forecast adjustments in the direction of increase;
- Send proposals to the MP regarding activities that can be excluded (for example, in addition to incoming activity, an outgoing call related to the project, if agreed upon with the customer, it can be temporarily suspended);

- Coordinate part-time work on the project;

If we are discussing a steady increase in workload, make a request for additional recruitment from the recruitment department.

- Coordinate with the RCC for allocation of employees from other projects;
- Conduct an analysis of qualitative and quantitative indicators in the department;
- Analyze the work of the SV, including the number of coaching sessions and meetings, if necessary, adjust the roadmap;
- Create a work plan with employees that will incorporate: feedback and meetings;
- Analyze the reasons for the incorrect choice of statuses: - employees do not know how to use the Naumen status model - employees become "tired" as a result of having a heavy load - the contact processing scheme is incorrectly set up: the operator is forced to mark training or technical issues after every contact;
- Promptly generate an information letter about regarding the malfunction;
- Review the load forecast;
- Coordinate with the MP on the downward adjustments of the forecast;
- Prepare a list of employees who can be sent on vacation if we are discussing a long-term reduction in workload;
- Coordinate with the RCC the transfer of part-time employees to other projects.

To track employee discipline and calculate project profitability, the question very often arises: "How effectively do employees earn their salaries?". Contact centers have clear indicators to help assess this very effectiveness.

The Utilization indicator is directly measures an operator's work efficiency: the time the operator devoted to direct duties (i.e., sitting in a chair and talking, processing chats, emails or waiting for incoming contacts), versus time spent on breaks, dining, training/coaching, or experiencing technical issues, etc. [12], [13], [14].

We consider Utilization, for this, we will need:

Productive time is the period during which the operator was seated, processing chats, emails, or waiting for a call. When expressed in Contact Center terms, this is the contact processing time included in the ANT + Waiting for the receipt of this contact. (Ringing + AT + Hold + ACW + Waiting time)

Billable time is the service hours paid to the operator.

The Utilization formula will look like this:

$$Utilization = \frac{productivetime}{paidtime} \times 100\% \quad (1)$$

Simply put, utilization is the percentage of productive time of all paid hours, the more productive time there is, the higher the % UR will be, while the % unproductive time should be lower. This is precisely what you need to pay attention to when analyzing and planning UR.

There is an experimentally established value for utilization, recommended by the international standard SORS=85%.

This means that 85% of the paid time, the operator processed calls, requests, and letters and while waiting for these calls, requests, and letters.

The remaining 15% of his paid time is devoted to rest (breaks and lunches) and to the work of a supervisor or group head with this operator, which typically occurs in the feedback statuses, coaching, meetings, or training.

What happens to the UR indicator if the operator overstays his break, or if the supervisor spends too long with him in a meeting or coaching? In this case, the percentage of the employee's time in unproductive statuses increases, and utilization begins to fall.

For example, you can consider the following description.

The duration of the operator's shift is 9 hours, including 8 hours of work and 1 hour of break/lunch.

For this shift, the 1 hour break accounts for 11% of the unproductive time of the total paid 9 hours.

If the supervisor does not engage in any work with this employee (does not conduct coaching, meetings, or trainings), and the operator has no technical issues (the status of technical problems is not indicated), in this case, the UR for the operator will be 89%: 100% (paid time per shift) - 11% (unproductive break and lunch time) = 89% (utilization).

Suppose this operator has technical problems, and he has logged the corresponding status as "Technical problems" for a duration of 30 minutes.

In this case, the total time of unproductive statuses for this employee during a 9 hour working day will be 1 hour and 30 minutes (1 hour for break/lunch and 30 minutes for technical problems), which amounts to 17% of unproductive time.

We will achieve 83% utilization for this operator.

As we know, the target value is 85%, therefore, in this case, we have already deviated from the target by 2%.

The same scenario occurs when a group of operators is affected.

Thus, to avoid deviation consistently meet the target utilization value, it is necessary to continuously monitor the operator's time spent in unproductive statuses. Calculations with the proposed schedule and the permitted time in unproductive statuses will help you with this.

The Verint program was developed by New Contact LLC to oversee discipline.

The Verint web interface includes several modules: The Employee Profile Management module serves as database for contact center employees, allowing for the storage and accumulation of both general and personal information about employees, including their preferences for work schedules [15], [16].

The tracking module enables you to view in real time what current activities each employee is engaged in and identify deviations from the schedule. This module enhances the transparency of employee work. It also allows you to see graphs of the load on the contact center, the level of service, the presence of staff, and compare the actual parameters with the planned ones (Fig. 1).

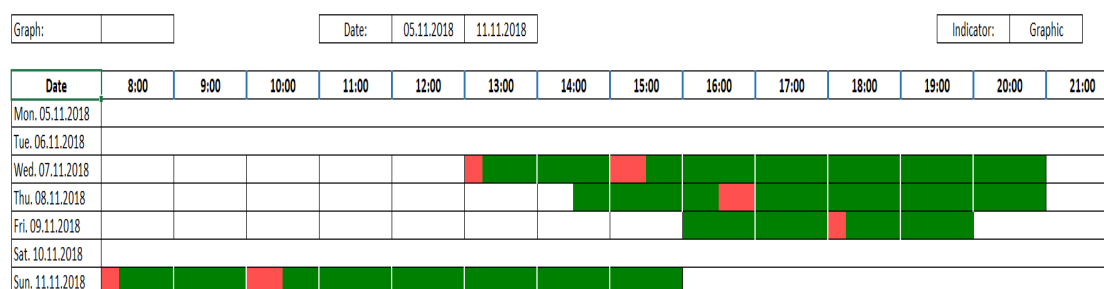


FIGURE 1. Verint program interface

Too long in activity – the number of employees who exceed the limit of being in any activity (if a limit is set for current scheduled activities - for example, the maximum break is 30 minutes);

Activities – activities that are planned and actually performed [17];

Daily summary (up to the present moment) – information on all selected employees in total;

Office hours according to the schedule – the total duration of all planned activities up to the present time (while the employee is not required to be in the office – depends on the type of planned activity);

Exceptions while working in the office – the total duration of all unconfirmed exceptions. At the same time, only those minutes of exceptions that occurred during the work of employees on schedule are counted here (if the operator got on the line earlier than the schedule, this exception will not be taken into account here);

Daily compliance is the percentage of time during which employees meet the planned schedule, up to the present moment;

Tabular view – a summary of each employee separately;

Scheduled activity is a planned activity that an employee must perform at a given time;

Does not match – the duration of the state of non-compliance with the current planned activity (not in total for the period);

The actual activity is what the operator is currently doing;

Time in activity – how long the operator is engaged in the current actual activity;

Daily compliance is the percentage of time during which an employee meets the planned schedule (i.e., only exceptions that occur during the period of work on the schedule are taken into account).

RESULTS

Compliance is a performance assessment tool that allows you to analyze an employee's compliance with schedules at any time during the day or assess trends and possible problems (Fig. 2).

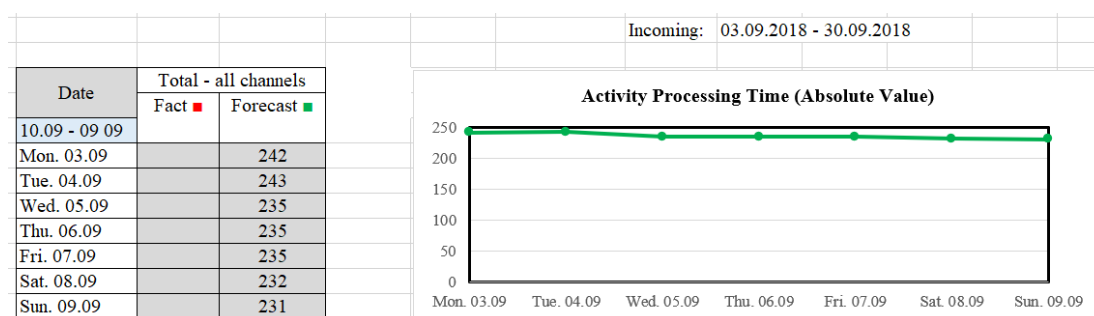


FIGURE 2. The “compliance” interface

In order to prevent the control of unproductive operator statuses from becoming endless disciplinary tasks, primarily related mainly to the analysis of deviations that have already occurred in the utilization indicator, it is necessary to plan the work of the supervisor with his group of operators.

All unproductive statuses can be divided into 2 groups: those that are easy to plan – such as coaching, training, meetings, lunches, and interruptions and those that cannot be planned, which are technical problems.

Let's return to the planned statuses. The supervisor for his group of operators' plans individual work (coaching, meetings, trainings) in Verint lasting from 15 minutes at the appointed time holds meetings with his employees, while he always pays attention to timings and tries to keep up with them. SEE the document Rules for Scheduling Unproductive Time in Verint.

Just like the SV, the RG conducts planning for internal training of employees in the training status, having previously calculated utilization while considering duration of training and the number of employees who are sent for it.

We will provide more details in the following example below.

The project staff, working in shifts of 40 people, amounts to 360 hours with a 9-hour working day. For this number of employees, the total duration of breaks per shift will be 40 hours. Let's assume that the project supervisors have scheduled coaching sessions with 15 operators during the shift. The average duration of each session will be 20 minutes, totaling 5 hours for all coaching sessions. In this case, the unproductive time on the project will be 45 hours (breaks and coaching). Dividing this number by the total paid time of all employees, $45/360$ —gives us an estimated percentage of unproductive time on the project, which will be 13%. Accordingly, the utilization of the project with this activity will be 87%.

However, if the RG needs to conduct long-term training of operators in the training status, let's assume there are 5 people. A 6-hour training schedule per day results in 30 hours of unproductive time and 30 paid hours. To calculate unproductive time for the project, taking into account the training group, it is necessary to sum all the time spent by operators in unproductive statuses (breaks, trainings, coaching) and divide by the total number of paid hours. $40+30+5$ where 40 represents the breaks of operators working in shifts, 30 is the total duration of the training of five operators, and 5 is the total duration of coaching. The total unproductive time on the project therefore 75 hours, which is 20.8%. In this case, the planned utilization of the project will be 79.2%.

DISCUSSION

Thus, even if you hold mass events for the project simultaneously analyzing and accounting for unproductive time, and accordingly controlling utilization, it easy to reach the planned target figure of 85% by the end of the month. On days with long training sessions, if you plan the optimal number of employees, utilization will not drop to critical levels and can be balanced out by other days of the month.

Special attention should be paid to the heads of departments and group leaders when planning the work of mentors. Their work also occurs in the unproductive status of “Mentor” and directly affects the utilization indicator.

We propose to explore this in more detail in the following description.

The project staff consists of 25 people working in shifts, which is 225 paid hours based on a 9 hour working day for all operators. Meanwhile, the duration of the breaks will be 25 hours – 11% of the total paid time.

Let's assume that there are 12 operators scheduled for coaching and SV meetings. Taking into account these unproductive statuses (breaks, lunches, coaching, and meetings), the total percentage of unproductive statuses will be 13%, therefore, the utilization for the project will be 87%.

Now we will assign 2 mentors to assist supervisors in onboarding a new group of mentors and grant them the appropriate "Mentor" status in Naumen software for a duration of 3 hours each. In total, these 2 mentors will be in the unproductive "Mentor" status for 6 hours per shift, and they will also have 2 hours for a lunch break. This amounts to a total of 8 hours of unproductive time per shift for these two mentors. Add their unproductive time to the general unproductive statuses of the project. Consequently, the total unproductive time, factoring in mentors, will be 37 hours – this represents 15% of the total paid time, resulting in 85% utilization per day.

CONCLUSION

Thus, if you plan and calculate unproductive statuses in advance and control the duration of these statuses, then the 85% utilization goal is easily achieved both during the day and over the course of the entire month.

The only status that cannot be scheduled is the status of a Technical problem.

The maximum duration of the operator's stay, which is limited by the company's regulations to 30 minutes and must be monitored by the project's administrative staff.

In cases of technical problems related to planned activities and utilization at 85%, a sharp decrease will occur due to the growth of this unproductive status. To maintain the indicator within the target values, strict control of the duration of this condition is necessary and, if necessary, the postponement of employee shifts in order to avoid prolonged stay in this unproductive status. To equalize the indicator in the event of its decrease, analyze potential for canceling planned activities carried out in unproductive statuses, such as canceling the activities of mentors and transferring their tasks to the project management.

In several projects, like the ISO project, the duration of paid technical problems is regulated by the orders of the MP and additionally paid by the customer. This is due to the performance of the customer's software and is regulated by the internal regulations of the project.

In such cases, the utilization indicator on days with prolonged technical problems on the part of the customer, in agreement with the MP, requires a recalculation and reduction of the target value is necessary.

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