

## ABSTRACT

Master's thesis: 107 pages, 11 figures, 28 tables, 2 appendixes, 32 references.

**Relevance.** It is rational to use schedule theory and linear programming methods for effective shift scheduling of employees with a flexible timetable. The particularity of these problems it is after added constraints or changed the objective, the known algorithms become ineffective. It initiates an appearance of approaches variety and methods of solving. Also, very frequently it is impossible to apply an accurate algorithm and it is needed to apply heuristic or approximate algorithms.

Service organizations have needs for tracking client flows, analysis and effective employee shift scheduling for a maximum meeting of client requests. So, shift scheduling of employees with a flexible timetable to meet the needs of organization it is actual for modern service sphere

**Relationship of work with scientific programs, plans, themes.** The work was carried out at National Technical University of Ukraine «Igor Sikorsky Kyiv Polytechnic Institute» the department of Computer-Aided Management and Data Processing Systems within the theme “Shift Scheduling for Employees with Flexible Work Schedule” (state registration number 0117U000919).

**Purpose and objectives of the study** are to organize the work of supermarket employees to minimize expenses for paying employees worktime with the condition of providing supermarket functioning (namely to form such employee schedule for which total excess (or deviation) number of employee and needs for them in given time intervals is minimal)

The following **tasks**:

- to formulate mathematical problem;
- to review existed methods and results of solving the problem;
- to develop the algorithm of flexible shift scheduling for employees to minimize total excess (or deviation) of employee number and needs for them in given time intervals;

- to implement the developed algorithms by writing program code;
- to implement the system for experimental research of the developed algorithms;
- to analyze got results;
- to develop an information system for shift scheduling of employees with a flexible timetable.

**The object of study** is the process of creating shift schedules for employees with a flexible timetable.

**Subject of research:** the methods of flexible work scheduling for employees.

**Research methods:** combinatorial optimization, operations research, heuristic methods.

**Scientific novelty of the research.** Two heuristic algorithms have been developed to solve the problem of shift scheduling for employees taking into account flexible lunchtime and their effectiveness has been researched.

**Publications.** The materials of the work are presented in a scientific article, which was sent to the office of special edition “Bulletin of the National Technical University «KHPI». Series: System Analysis, Control and Information Technology” (International Standard Serial Number ISSN 2079-0023) and abstract of the research is published in the Materials of the Third All-Ukrainian Scientific and Practical Conference of Young Scientists and Students "Information Systems and Management Technologies" (ISTU-2019).

FLEXIBLE SCHEDULING, SHIFT SHEDULING, PLANNING, SCHEDULE THEORY, MINIMIZING THE TOTAL DEVIATION, HEURISTIC ALGORITHM, LINEAR INTEGER PROGRAMMING, BINARY LINEAR PROGRAMMING