LABOR OPTIMIZATION SYSTEM

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# **Acronyms**

UBOS Uganda Bureau Of Statistics

# **1 Introduction**

## **1.1 Background**

Utilization of labor as resource in organizations has over the years become a problem with equipped employees at the exposure of the organization and yet not optimally utilized that is to say, the labor is either underutilized to their ability or over utilized hence less or no efficiency. The 2018 Statistical Abstract published by UBOS states that the total rate of labor underutilization in both the private and public sector is 38.1% and also states the growth in labor productivity as a direct factor of the social economic growth hence posing a need to improve the labor productivity in Uganda and the world at large [1].

Various determinants of the labor productivity have been suggested among which is the use of technology [2]. Currently, organizations are using the concept of specialization that is the use of individuals who are specialized in a given field to provide the services, the use of clock in systems and many more and though these would help in monitoring and utilization of the labor in the organization, they cannot be used to allocate the right amount of work to the employees, and so at most times, there might be a problem of labor over utilization on the days where the work is a lot or labor underutilization on the days where there is less or no work to do for a specific group of people. We therefore intend to make more research in this field and use the data collected to create a model that can be used to predict the labor needed for a specific day and time as in relation to the work load available. This in a way will bring about labor optimization and hence an improvement in the efficiency of the labor therefore an increase in the organization profits.

The goal of the research was to establish whether problems of ineffective labor utilizations in organizations exist and what measures have been taken to solve them.

## **1.2 Objectives**

### 1.2.1 Main Objectives

To establish whether problems of ineffective labor utilizations in organizations exist and what measures have been taken to solve them.

### 1.2.2 Specific Objectives

1. To study the background of inefficient utilization of labor in organizations.
2. To research about the available solutions to inefficient labor utilizations and see their strengths and weaknesses.
3. To come up with the requirement specifications for an improved solution that is, our predictive model.
4. To design and develop a predictive model to solve the problem above.

# **2 Methodology**

## **2.1 Research Questions**

The research questions to be answered by this study are:

1. Is there a criterion for allocating workers in your organization?
2. Is there a system, manual or software used to allocate work to the workers within your organization?
3. Do you think that this system can be improved?
4. Do you think there is labor underutilization within your organization?
5. What are the challenges with the current model of allocation of work to workers?
6. Is there any means of analyzing employee productivity within your organization?
7. How many roles do you think are within your organization?
8. Which of these roles interact directly with your clients?
9. Is there any imbalance between the amount of work and the workers available at any given time?
10. How often are roles vacant within your organization?
11. What are the most crucial roles within your organization?
12. How often do imbalances surface between work and the workers available?
13. How often is recruitment and releasing of employees within your organization?
14. How does the number of employees match up with the productivity of your organization?
15. How much do Leave often affect your organization? (Negatively)

## **2.2 Research Design**

The respondents will use qualitative, quantitative and mixed methods to answer the research questions. The following table summarizes the methods used to answer each question:

|  |  |
| --- | --- |
| **Research Question** | **Method Used to answer question** |
| Is there a criterion for allocating workers in your organization? | Interview and Questionnaire |
| Is there a system, manual or software used to allocate work to the workers within your organization? | Interview and Questionnaire |
| Do you think that this system can be improved? | Interview and Questionnaire |
| Do you think there is labor underutilization within your organization?  What are the challenges with the current model of allocation of work to workers? | Interview and Questionnaire |
| Is there any means of analyzing employee productivity within your organization? | Interview and Questionnaire |
| How many roles do you think are within your organization? | Interview and Questionnaire |
| Which of these roles interact directly with your clients? | Interview and Questionnaire |
| Is there any imbalance between the amount of work and the workers available at any given time? | Interview and Questionnaire |
| How often are roles vacant within your organization? | Interview and Questionnaire |
| What are the most crucial roles within your organization? | Interview and Questionnaire |
| What are the most crucial roles within your organization? | Interview and Questionnaire |
| How often do imbalances surface between work and the workers available? | Interview and Questionnaire |
| How often is recruitment and releasing of employees within your organization? | Interview and Questionnaire |
| How does the number of employees match up with the productivity of your organization? | Interview and Questionnaire |
| How much do Leave often affect your organization? (Negatively) | Interview and Questionnaire |

Table 1 **Methods used to answer questions**

## **2.3 Instruments**

We designed a questionnaire containing all the above questions and created copies which we gave out to respondents. The questionnaire can be found in the Appendix section. Interviews were recorded using mobile phones voice recorded as they were physical face to face.

## **2.4 Sample**

The sample space contained all organizations that have laborers. This ranged from hospitals, Banks to Hotels. The sample was selected based on convenience as some organizations were not willing to talk to us within the available time frame. There was no control or comparison group.

## **2.5 Data Collection**

The data was collected by all the four members of the group. We would send in questionnaire to respondents who were willing to participate in our study. We also sat down with some respondents and conducted interviews.

## **2.5 Data Analysis**

Data from filled in questionnaire was entered into an excel file and the analysis was conducted using the inbuilt Excel tool. Statistical tests were conducted to get insights into data collected.

## **2.6 Limitations**

We were limited by being unable to have some desired sampled respondents participate in the study due to their unwillingness to do so and also their schedules not allowing.

# **3 Result**

**3.1 Is there a criterion for allocating workers in your organization? Criteria used**

**3.2 Is there a system, manual or software used to allocate work to the workers within your organization?**

**3.3 Do you think that this system can be improved?**

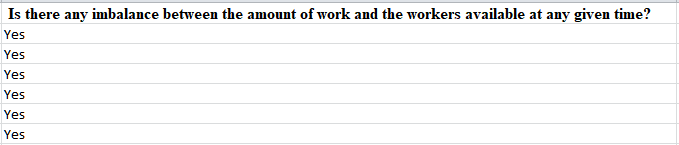
**3.4 Do you think there is labor underutilization within your organization?**

**3.5 What are the challenges with the current model of allocation of work to workers?**

**3.6 Is there any means of analyzing employee productivity within your organization?**

**3.7 How many roles do you think are within your organization?**

**3.8 Is there any imbalance between the amount of work and the workers available at any given time?**



**3.9 How often are roles vacant within your organization?**

**3.10 How often do imbalances surface between work and the workers available?**

**3.11 How often is recruitment and releasing of employees within your organization?**

**3.12 How does the number of employees match up with the productivity of your organization?**

**3.13 How much does Leave often affect your organization? (Negatively)**

# **4 Discussion**

From the results, we can observe the following;

* Organizations have criteria for allocating work to laborers, most notably based on skills and experience.
* Nearly less than 50% of organizations have a system in place for allocation of work to employees
* Majority of organizations think their work allocation system needs improvement.
* Majority of organizations confirm that there is labor underutilization.
* Number of workers do not match the number of employees available.
* Most organizations have means of analyzing employee productivity
* Number of employees match with productivity at a 50% level.
* Unplanned leave affects up to 1/3 of organizations.

What we can conclude from these results are;

* Organizations have employees (laborers) who are good at their jobs. However, there is a mismatch between number of employees and the load of work available. This is due to poor systems of allocation of work to available employees hence majority of the systems need overhauls and improvements.

# **5 Recommendations**

Based on results from the study, the following recommendations are made:

Organizations should acquire automated work allocation and productivity analysis system to realize optimal utilization of labor.

# **6 References**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| |  |  | | --- | --- | | [1] | Uganda Bureau of Standards , "2018 Statistical Abstracts," Kampala. | | [2] | S. Kavuma, "Increasing labour productivity for inclusive growth". | |  |  |
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# **7 Appendices**

## **7.1 Questionnaire used in the study**

**RESEARCH ON LABOR UTILIZATION IN ORGANIZATIONS**

This research is being conducted by a group of final year students at Makerere University to determine how well organizations utilize labor at their disposal. The findings shall help in building an intelligent software system to help organizations optimize labor at their disposal and increase productivity and reduce on labor related losses in businesses. Please help us participate in this survey that will take you maximum 15 minutes. **Thank you for your time.**

**PART ONE: Questions about System of work allocation.**

1. Is there a criterion for allocating workers in your organization?
2. Yes b) No c) Not Sure
3. Is there a system, manual or software used to allocate work to the workers within your organization?
4. Yes b) No c) Not Sure
5. Do you think that this system can be improved?
6. Yes b) No c) Not Sure

If your answer to the above is yes, how do you think it can be improved?

……………………………………………………………………………………………………………………………………………………………………………………

1. Do you think there is labor underutilization within your organization?
2. Yes b) No c) Not Sure

If your answer to the above is yes, why is the problem unattended to?

……………………………………………………………………………………………………………………………………………………………………………………

1. What are the challenges with the current model of allocation of work to workers?

…………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………....................................................................

1. Is there any means of analyzing employee productivity within your organization?
2. Yes b) No c) Not Sure

**PART TWO: Questions about roles and available tasks in your organization**

1. How many roles do you think are within your organization?

Below 10 b) Between 10 - 100 c) Above 100

1. Which of these roles interact directly with your clients?

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………

1. Is there any imbalance between the amount of work and the workers available at any given time?
2. Yes b) No c) Not Sure
3. How often are roles vacant within your organization?
4. Very Frequent b) Rarely c) Not At Any Time
5. What are the most crucial roles within your organization?

………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………............

1. How often do imbalances surface between work and the workers available?

a) Very Frequent b) Rarely c) Not at Any Time

**PART 3: Questions about the workers within your organization**

1. How often is recruitment and releasing of employees within your organization?

a) Very Frequent b) Rarely c) Not At Any Time

1. How does the number of employees match up with the productivity of your organization?

a) Balanced b) More Productivity c) Less Productivity

1. How much do Leave often affect your organization? (Negatively)

a) Very Much b) Rarely c) Not At Any Time