**Project Proposal**

**Decision Support System for Scheduling Medical Teams**

**Introduction**

Each medical team faces the issue of efficiently handling elective patients within allocated time blocks set by the department head in the complex field of healthcare scheduling. The task necessitates a careful combination of speed, efficiency, and adaptability. The current ad hoc assignment of teams to non-emergency medical operations does not take into account the critical factors for effective team composition. Recognizing the complexities of scheduling within time constraints, our primary goal is to create a Decision Support System. This Decision Support System will enable medical doctors to schedule elective patients quickly, efficiently, and dynamically hence assuring ideal alignment with departmental time allocations. This proposal presents a thorough strategy for meeting this crucial demand while also improving the general effectiveness of our medical staff (Clavel et al., 2020).

**Problem Statement**

Inefficiencies in team selections affect non-emergency medical operations that are arranged days in advance. The current ad hoc technique ignores the possibility of optimizing team compositions hence reducing total performance. Recognizing the cumulative progress of teams over time necessitates the use of an organized approach to strategically assign efficient teams to each operation. This proposal seeks to address this issue by proposing the building of a Decision Support System that suited to our medical facility's specific needs.

**Methodology/Approach**

**Descriptive Statistics**

The statistics show significant differences in procedure time across categories. The total sum of duration by daytime in the morning is 1192004, which differs clearly from the minimum 155677 in the evening category.

**Summary of Duration in Minutes**

|  |  |
| --- | --- |
| Mean | 156.66 |
| Standard Error | 0.29 |
| Median | 152.00 |
| Mode | 144.00 |
| Standard Deviation | 36.45 |
| Sample Variance | 1328.79 |
| Kurtosis | 54.12 |
| Skewness | 2.99 |
| Range | 1130.00 |
| Minimum | 2.00 |
| Maximum | 1132.00 |
| Sum | 2423369.00 |
| Count | 15469.00 |

The table indicates that procedures last an average of 156.66 minutes, with a median of 152.00 minutes.

**Summary of Average Duration for each Team**

|  |  |
| --- | --- |
| Mean | 162.78 |
| Standard Error | 0.48 |
| Median | 158 |
| Mode | 152 |
| Standard Deviation | 39.93 |
| Sample Variance | 1594.72 |
| Kurtosis | 54.12 |
| Skewness | 3.34 |
| Range | 1130 |
| Minimum | 2 |
| Maximum | 1132 |
| Sum | 1135233 |
| Count | 6974 |

The average time for each team composition is around 162.78 minutes, with a median of 158 minutes.

**Optimality Criteria**

1. Average Length of Duration: I calculated Average Duration for Each Team column to determine each team’s efficiency.
2. Team Composition Frequency: I determined the frequency of each unique team composition to identify frequently occurring teams.
3. Team Consistency: I calculated the standard deviation of durations for each team.
4. Optimal Team Identification – Using Excel Solver, identify specific team compositions associated with the shortest average durations to be “Team Number 3132 with "710-515-916-520-723”, Duration of 4”

These criteria collectively contribute to team optimality measurement by emphasizing efficiency, consistency, and specific compositions that result in shorter durations.

**Spreadsheet Solution**

Attached

**Minimal Data Items for Improvement**

* Years of experience and specialization for each team member.
* Previous outcomes, complications, and success rates.
* The number of times each team has carried out specific procedures.

**Conclusion**

In conclusion, the optimal solution shows crucial team compositions “Team Number 3132 with "710-515-916-520-723”, Duration of 4” showing the effectiveness of the system. This shows the potential of our proposed Decision Support System to improve medical staff effectiveness and patient outcome.

# References

Clavel, D., Mahulea, C., Albareda, J., & Silva, M. (2020). A Decision Support System for Elective Surgery Scheduling under Uncertain Durations. *Applied Sciences*, *10*(6), 1937. https://doi.org/10.3390/app10061937