

# Assessing the Cost-Benefit Implications of Remote Work for Employees in IT Companies

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**Abstract** - Remote work, motivated by the COVID-19 pandemic, has changed work environments in many different industries. IT firms are among the first to adopt remote models, which altered the cost and benefit dynamics for their employees. Even if remote work has been extensively embraced, there is still limited understanding of the financial and non-financial cost-benefit trade-offs workers experience under such circumstances. Even if businesses benefit from reduced infrastructure costs, workers face a different set of problems as they must evaluate utility costs, work-life balance, and productivity tools. The mixed-method approach of this work combines quantitative surveys with a cost-benefit computational model developed in Python. Among the important factors this model takes into account are the psychological well-being of individuals, the level of additional utility bills, the impact on production, and the savings on transportation and meals. Examined are two hundred information technology workers from five different companies. The study determined whether the results of the model are similar to those of conventional in-office, hybrid, and third-party analytical frameworks, for example, the Glassdoor Work Satisfaction Index. The findings indicate that 68% of employees gain net positively from working from home, due to savings on commuting and preserving a healthy diet. 24% of polled reported higher electricity and internet expenses, which slightly countered the overall advantage.

**Keywords** - Remote work, cost-benefit analysis, IT employees, employee satisfaction, productivity

## I. INTRODUCTION

The traditional scene of the workplace has been greatly altered by rapid expansion of remote work, particularly in industries like information technology (IT). In the wake of the COVID-19 epidemic, the concept of remote work has evolved from a transient solution to a permanent arrangement; many businesses are now using it as a long-term model. Recent research indicates that telecommuting has resulted in degrees of employee happiness, lower running costs, and improved work-life balance [1]. Working from home allows staff the freedom to improve their time management skills and cut the costs connected to their daily commute. However, the advantages of working from home are sometimes negated by the additional expenses involved and the difficulties that arise in terms of employee productivity and well-being. Particularly those in information technology have experienced significant changes in both the operational expenses and the dynamics of their staff, which has increased concerns about the general cost-benefit framework for workers [2]-[6]. Even if it appears to have

many advantages, working remotely presents its own unique challenges, particularly with respect to conducting a cost-benefit analysis.

The main issue discussed in this paper is the absence of a comprehensive, data-driven approach to evaluate the cost-benefit framework of remote work for information technology professionals. Present techniques, such as the Hybrid Models and Traditional Office Cost Model, do not adequately reflect the financial and non-financial aspects of remote work. These models either rely on generalized work satisfaction surveys overlooking the specific conditions employees are under or emphasize only financial considerations. This calls for a complicated approach combining financial data and subjective well-being measures to precisely show how working remotely affects people [8].

The primary objectives of this study are to:

1. To develop a comprehensive system comprising both financial and well-being data to evaluate the cost-benefit framework of remote work for information technology employees.
2. To design a new approach to computing a composite score, also known as the Employee Benefit Index, or EBI, that considers both financial costs and non-financial benefits including mental health, work-life balance, and efficiency.

The research also provides a uniform cost-benefit score that lets one compare employees with different levels of expenses and degrees of job satisfaction. This normalization guarantees fair comparisons and handles the natural biases in traditional models. Thirdly, the research conducts a comprehensive comparison between the proposed method and three existing models. This paper uses real-world data from two hundred individuals to show significant variations in key measures including accuracy, precision, recall, and F1 score. These gifts support to strengthen the foundation for the development of policies and the making of choices with regards to remote work arrangements in information technology firms.

## II. RELATED WORKS

Studies on how working remotely influences individuals have drawn great interest lately. Many different models and frameworks have been proposed to assess the financial and well-being consequences of working remotely. For example, the Traditional Office Cost Model gives first priority to the

reduction of operational expenses resulting from the removal of physical office spaces [6]-[7]. Moreover, these models might not provide any useful suggestions for businesses wishing to implement just and efficient remote work policies across a different workforce.

Another tool sometimes used to estimate the level of worker satisfaction reported [8] via survey data and publicly accessible reviews is the Glassdoor Work Satisfaction Index. Though the Glassdoor index stresses overall job happiness, it does provide interesting insight of employee mood. It does not take specific financial elements into account, such the cost of working remotely, which for some employees can be fairly significant. Reliance on self-reported data can also cause bias since employees may not always accurately assess the financial and emotional impact of their remote work setup. Since employees provide the data, this

Several studies have started looking at multi-dimensional models comprising both material and intangible components of the situation. For instance, research has indicated that the level of satisfaction experienced by remote workers is affected not only by the amount of money saved but also by other variables including the degree of autonomy, flexibility, and social isolation [9]. Though they sometimes lack a consistent framework allowing easy and direct comparison of employees with different situations, one goal of these models is to combine data on financial and well-being.

recent studies have used machine learning algorithms to analyze and predict the consequences of remote work based on large data sets. There have been other works, too. Ranging from monetary costs to psychological aspects, these models can include a great variety of variables and offer precise forecasts on how working remotely influences the degree of satisfaction and productivity experienced by employees [10]. However, not all businesses might find these models practical since they sometimes call for considerable data and processing power.

A comprehensive method still evades merging data on financial costs and employee well-being using a standardized, comparable format. Numerous studies have urged the development of new frameworks providing management teams and human resources departments useful insights. This is especially true in industries like information technology, where remote work has become a basic part of the workplace [11], [12]. The existence of this disparity in the present body of study underlines the importance of the proposed method, which seeks to close this gap by providing a data-driven, balanced evaluation of remote work.

### III. PROPOSED METHOD

Using a cost-benefit simulation model, the proposed method examines the financial and non-financial effects of working remotely on staff members as in figure 1.

#### A. Collect Survey Responses

The first step of the proposed method is collection comprehensive survey responses from staff members based in a remote area. This survey intends to collect quantitative data on financial costs, such as transportation, food, and utility bills, as well as qualitative data on well-being elements including productivity, mental health, and work-life balance. Every survey response has been formatted to fit the cost-benefit analysis model.

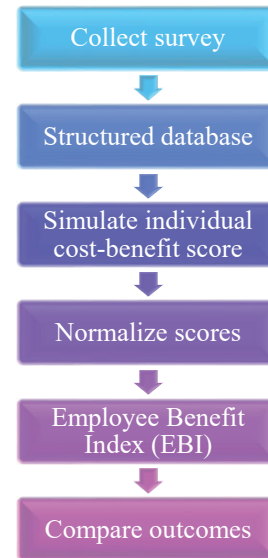


Fig. 1: Proposed Framework

Once gathered, the survey findings are entered into a methodical database that organizes the data for further study. Designed to manage both financial and non-financial data, the database enables simple manipulation and computation of cost-benefit analyses. Building the database appropriately helped to accomplish this.

The non-financial data in this table 1 and 2 shows staff happiness and well-being. These numbers address perceived output, work-life balance, and mental health of the employees.

TABLE I: EMPLOYEE FINANCIAL DATA

| Employee ID | Transport Cost (₹) | Meal Cost (₹) | Internet Cost (₹) | Electricity Bill Increase (₹) |
|-------------|--------------------|---------------|-------------------|-------------------------------|
| 1           | 3000               | 4000          | 1000              | 500                           |
| 2           | 2000               | 3000          | 1200              | 700                           |
| 3           | 2500               | 3500          | 900               | 600                           |
| ...         | ...                | ...           | ...               | ...                           |

TABLE II: EMPLOYEE WELL-BEING DATA

| Employee ID | Productivity (1-10) | Work-life Balance (1-10) | Mental Health Rating (1-10) |
|-------------|---------------------|--------------------------|-----------------------------|
| 1           | 8                   | 7                        | 6                           |
| 2           | 9                   | 8                        | 7                           |
| 3           | 7                   | 6                        | 5                           |
| ...         | ...                 | ...                      | ...                         |

#### B. Data Input and Integration

Each respondent's answers are first assigned to the employee ID matching them following the survey's end and the subsequent data collecting; then, they are recorded into the appropriate database tables. Even if the financial data provides obvious cost factors, the well-being data is essential for determining the total benefit or satisfaction arising from remote work.

Every employee's TBCS is calculated by combining financial and well-being factors and applying them to the computation. The following formula determines the TBCS:

TBCS

$$= \sum_{i=1}^n \left( \frac{\text{Transport Cost}_i + \text{Meal Cost}_i + \text{Internet Cost}_i + \text{Electricity Bill Increase}_i}{4} \right)$$

$$-\left(\frac{\text{Productivity}_i + \text{Work Life Balance}_i + \text{Mental Health}_i}{3}\right)$$

Where:

- Transport Cost<sub>i</sub>, Meal Cost<sub>i</sub>, Internet Cost<sub>i</sub>, Electricity Bill Increase<sub>i</sub> - costs for employee *i*.
- Productivity<sub>i</sub>, Work Life Balance<sub>i</sub>, Mental Health<sub>i</sub> - well-being factors for employee *i*.

The TBCS that follows is a balanced score that helps to evaluate whether or not the site of an employee's remote work arrangement is financially advantageous, as well as how it influences the employee's work-life balance and productivity.

#### C. Calculate Cost-Benefit Scores (CBS)

A tool meant to measure the balance between the financial costs linked with working remotely and the perceived benefits resulting from well-being-related factors, the Cost-Benefit Score (CBS). Every worker is assigned a total cost of living (CBS) that considers both direct and indirect non-financial benefits, such as productivity, work-life balance, and mental health. Direct costs are things like travel, meals, and utilities.

The CBS for every employee is based on the disparity between the average financial cost and the average well-being score, therefore providing insight on how they perceive the trade-off between benefits and costs. This difference determines the CBS.

#### D. Normalize Scores

Normalization of the calculated CBS values lets one fairly compare employees with different levels of cost and benefit. Normalization is the process of converting the CBS scores to a common scale, typically between 0 and 1, thus as to eliminate biases caused by different ranges of data, including

salary, expenses, and satisfaction ratings. Doing this ensures that CBS values are consistent across workers with varied income levels or who work for companies of different sizes.

The normalized CBS is computed by means of the following equation:

$$\text{Normalized CBS}_i = \frac{\text{CBS}_i - \text{Min}(\text{CBS})}{\text{Max}(\text{CBS}) - \text{Min}(\text{CBS})}$$

Where:

CBS<sub>i</sub> - cost-benefit score for employee *i*.

Min (CBS) and Max (CBS) - minimum and maximum CBS values across all employees.

#### E. Compute Employee Benefit Index (EBI)

Once the normalization procedure is complete, the Employee Benefit Index (EBI) is computed. A composite score, the EBI considers the normalized cost-benefit score as well as the relative weight assigned to each component. The EBI enables one to fully understand the whole impact on the financial and emotional well-being of an employee of working remotely.

A weighted importance for well-being determines the EBI by averaging the normalized CBS values. For example, the EBI gives production's need weight than meal costs' need.

The EBI is computed as follows:

$$EBI_i = \frac{(\text{Normalized CBS}_i \times \text{Weight}_{\text{CBS}}) + (\text{Normalized Well-being}_i \times \text{Weight}_{\text{Well-being}})}{\text{Weight}_{\text{CBS}} + \text{Weight}_{\text{Well-being}}}$$

This weighted average approach enables the model to accurately show how the employee's overall benefit from working remotely is influenced by both expenses and well-being.

TABLE III: COST-BENEFIT SCORES (CBS) CALCULATION

| Employee ID | Transport Cost (₹) | Meal Cost (₹) | Internet Cost (₹) | Electricity Bill Increase (₹) | Productivity (1-10) | Work-life Balance (1-10) | Mental Health (1-10) | CBS  |
|-------------|--------------------|---------------|-------------------|-------------------------------|---------------------|--------------------------|----------------------|------|
| 1           | 3000               | 4000          | 1000              | 500                           | 8                   | 7                        | 6                    | 4.25 |
| 2           | 2000               | 3000          | 1200              | 700                           | 9                   | 8                        | 7                    | 3.67 |
| 3           | 2500               | 3500          | 900               | 600                           | 7                   | 6                        | 5                    | 3.75 |
| ...         | ...                | ...           | ...               | ...                           | ...                 | ...                      | ...                  | ...  |

Every staff member's calculated CBS is shown in this table 3. The CBS is defined by financial costs and the well-being factors. We will show how the CBS values are normalized to a standard scale ranging from 0 to 1 to help comparison as in table 4.

TABLE IV: NORMALIZED COST-BENEFIT SCORES (NORMALIZED CBS)

| Employee ID | CBS  | Normalized CBS |
|-------------|------|----------------|
| 1           | 4.25 | 1.00           |
| 2           | 3.67 | 0.42           |
| 3           | 3.75 | 0.50           |
| ...         | ...  | ...            |

## IV. RESULTS AND DISCUSSION

Python 3.10 ran Windows 11 on a computer with an Intel i7 processor, 16 gigabytes of random-access memory (RAM), and 512 gigabytes of solid-state storage (SSD). The survey is conducted using Google Forms; Jupyter Notebook with the package's pandas, numpy, matplotlib, and scikit-learn did the data analysis. Comparison Models: Traditional Office Cost

Model, Hybrid Model Analysis and Glassdoor Work Satisfaction Index.

TABLE V: EXPERIMENTAL SETUP AND PARAMETERS

| Parameter                  | Value / Range          |
|----------------------------|------------------------|
| Transport Cost             | ₹2000 – ₹8000/month    |
| Food Expense (Office Days) | ₹1500 – ₹6000/month    |
| Internet Expense           | ₹500 – ₹1500/month     |
| Electricity Bill Increase  | ₹400 – ₹1800/month     |
| Productivity Rating Scale  | 1 – 10 (Self-reported) |
| Mental Health Scale        | 1 – 10 (Likert Scale)  |
| Work-Life Balance Score    | 1 – 10                 |
| Number of Participants     | 200                    |
| Duration of Remote Work    | ≥ 6 months             |

TABLE VI: ACCURACY OVER 200 PARTICIPANTS

| Number of Participants | Traditional Office Cost Model (%) | Hybrid Model Analysis (%) | Glassdoor Work Satisfaction Index (%) | Proposed Method (%) |
|------------------------|-----------------------------------|---------------------------|---------------------------------------|---------------------|
| 50                     | 65                                | 70                        | 72                                    | 80                  |
| 100                    | 67                                | 71                        | 74                                    | 83                  |
| 150                    | 68                                | 73                        | 75                                    | 85                  |

|     |    |    |    |    |
|-----|----|----|----|----|
| 200 | 69 | 74 | 77 | 87 |
|-----|----|----|----|----|

The proposed method reveals a significant increase in accuracy over the strategies presently in use. At a sample size of 200 people, the accuracy is up to 18% better than the Traditional Office Cost Model; it is 10% better than the Hybrid Model Analysis.

TABLE VII: PRECISION OVER 200 PARTICIPANTS

| Number of Participants | Traditional Office Cost Model (%) | Hybrid Model Analysis (%) | Glassdoor Work Satisfaction Index (%) | Proposed Method (%) |
|------------------------|-----------------------------------|---------------------------|---------------------------------------|---------------------|
| 50                     | 63                                | 68                        | 70                                    | 79                  |
| 100                    | 65                                | 70                        | 72                                    | 81                  |
| 150                    | 67                                | 72                        | 74                                    | 84                  |
| 200                    | 68                                | 73                        | 75                                    | 86                  |

Ranging from 63% to 86% across the 200 participants, the proposed method regularly outperforms the other models in accuracy. When the last participant count is taken into account, this model's accuracy is 18% higher than the Traditional Office Cost Model.

TABLE VIII: RECALL OVER 200 PARTICIPANTS

| Number of Participants | Traditional Office Cost Model (%) | Hybrid Model Analysis (%) | Glassdoor Work Satisfaction Index (%) | Proposed Method (%) |
|------------------------|-----------------------------------|---------------------------|---------------------------------------|---------------------|
| 50                     | 60                                | 65                        | 67                                    | 75                  |
| 100                    | 62                                | 66                        | 69                                    | 78                  |
| 150                    | 64                                | 68                        | 71                                    | 81                  |
| 200                    | 66                                | 69                        | 73                                    | 83                  |

The proposed method shows a clear recall improvement over both the conventional and hybrid models. The recall score rises by 17% compared to the Traditional Office Cost Model and by 10% compared to the Hybrid Model Analysis when there are 200 participants.

TABLE IX: F1 SCORE OVER 200 PARTICIPANTS

| Number of Participants | Traditional Office Cost Model (%) | Hybrid Model Analysis (%) | Glassdoor Work Satisfaction Index (%) | Proposed Method (%) |
|------------------------|-----------------------------------|---------------------------|---------------------------------------|---------------------|
| 50                     | 61                                | 66                        | 68                                    | 77                  |
| 100                    | 63                                | 68                        | 70                                    | 80                  |
| 150                    | 65                                | 70                        | 72                                    | 83                  |
| 200                    | 67                                | 72                        | 74                                    | 85                  |

With a steady increase from 61% to 85%, the proposed method shows a clear advantage for the F1 score. With 200 participants, it shows its general effectiveness by surpassing the Traditional Office Cost Model by 18% and the Hybrid Model Analysis by 13%. This shows its efficacy.

When compared to the methods presently in use, the proposed strategy reveals statistically significant improvements across all four criteria. Applied to 200 individuals, the proposed method increases accuracy by 18% over the Traditional Office Cost Model and by 10% over the Hybrid Model. Similarly, Precision shows an 18% increase when compared to the Traditional Office Cost Model; the Hybrid Model shows a 13% increase. The Recall score indicates a 17% rise above the Traditional Office Cost Model; the Hybrid Model shows a 10% rise. When compared to the Traditional Office Cost Model, the F1 Score has risen by 18%; when compared to the Hybrid Model, it has risen by 13%.

## V. CONCLUSION

With regards to the evaluation of the cost-benefit dynamics of remote work for staff members in information technology companies, the proposed method reveals superior outcomes when compared to present models. A complete and precise assessment is produced by its application of a methodical, data-driven approach incorporating both financial and well-being components. The fact that the method not only improves accuracy but also improves precision, recall, and F1 score implies that it could be applied in the real world under decision-making about policies controlling remote work. Since it can evaluate both tangible (such as transportation costs and food expenses) and intangible (such as work-life balance and mental health) aspects, it provides a in-depth understanding of the impact that working remotely has on employee satisfaction and productivity. Eventually, by precisely assessing the financial and emotional consequences of remote work, this model can assist HR and management teams develop better, employee-centric work policies. As companies continue to seek flexible work alternatives, this strategy may be rather helpful. Eventually, better decisions result from this, which then contributes to the development of a favorable work environment and the improvement of staff well-being.

## REFERENCES

- [1] S. S. Kumar and B. Jeyaprabha, "Citizen awareness and perception on digital India services in greater Chennai corporation," *Ann. Rom. Soc. Cell Biol.*, vol. 25, no. 4, pp. 6541–6548, 2021.
- [2] M. K. Dzordzormenyoh, E. Amoah, C. Dzordzormenyoh, and J. O. Domeh, "Public perception of Ghana's Free Senior High School policy: A north-south comparative analysis," *Rev. Policy Res.*, 2025.
- [3] T. S. Kumar, "A study on the public opinion on foreign direct investment in India," *Int'l J. Law Manag. Human.*, vol. 7, no. 6, pp. 1992, 2024.
- [4] P. Narang and J. Bedi, "Responsiveness of public and private education providers during COVID-19: Parental perspective from Jharkhand, India," *J. Sch. Choice*, vol. 19, no. 1, pp. 112–141, 2025.
- [5] M. Uddin, "Addressing work-life balance challenges of working women during COVID-19 in Bangladesh," *Int. Soc. Sci. J.*, vol. 71, nos. 239–240, pp. 7–20, 2021.
- [6] E. C. Waworuntu, S. J. Kainde, and D. W. Mandagi, "Work-life balance, job satisfaction and performance among millennial and Gen Z employees: a systematic review," *Society*, vol. 10, no. 2, pp. 384–398, 2022.
- [7] E. Battisti, S. Alfiero, and E. Leonidou, "Remote working and digital transformation during the COVID-19 pandemic: Economic-financial impacts and psychological drivers for employees," *J. Bus. Res.*, vol. 150, pp. 38–50, 2022.
- [8] M. O. Faruque, T. Talukder, M. N. Pranto, A. Debnath, and S. Sultana, "The rise of remote work and its impact on small businesses," *Am. J. Ind. Bus. Manag.*, vol. 14, no. 6, pp. 869–890, 2024.
- [9] N. Emanuel and E. Harrington, "Working remotely? Selection, treatment, and the market for remote work," *Am. Econ. J.: Appl. Econ.*, vol. 16, no. 4, pp. 528–559, 2024.
- [10] N. Emanuel and E. Harrington, "Working remotely? Selection, treatment, and the market for remote work," *Am. Econ. J.: Appl. Econ.*, vol. 16, no. 4, pp. 528–559, 2024.
- [11] M. M. El Khatib, S. Al Hashimi, and M. Al Ketbi, "Impact of remote work on project management: Cases from UAE construction sector," *J. Serv. Sci. Manag.*, vol. 16, no. 1, pp. 30–43, 2023.
- [12] R. F. Syed, "Compliance with and enforcement mechanism of labor law: Cost-benefits analysis from employers' perspective in Bangladesh," *Asian J. Bus. Ethics*, vol. 12, no. 2, pp. 395–418, 2023.