

Analytics Startup Plan

Synopsis: *This document provides a high-level walkthrough of the activities required to guide completion of the analysis.*

Project	Work From Home or Back To Office: Bridging the Gap in Work Arrangement Attitudes Between Employers and Employees
Requestor	David Parent and William Au
Date of Request	July 15, 2022
Target Quarter for Delivery	Quarter 3 (August) 2022
Submitted by	Daisy Johanna Uy
Business Impact	Higher employee engagement, lower employee turnover, and accurate data-based evaluation of the likelihood of employees' work arrangement preferences

1.0 Business Opportunity Brief

Many businesses are implementing plans to bring employees back to the office post-pandemic. However, many employees have discovered benefits in their WFH experience, with 83 per cent of non-executive employees preferring a fully remote or hybrid work arrangement moving forward (Future Forum, 2021). This does not match senior executives' enthusiasm about the return to office, and that employer-employee disconnect could be a sign of employee resistance to the continuing work environment changes.

This emerging issue could further complicate the talent shortage created by the Great Resignation that began in 2021. There is an opportunity for businesses to study the factors driving employees' preferences for certain working arrangements. They can then leverage those insights in their initiatives for work environment changes, reducing the impacts of employee turnover and employee disengagement related to these factors.

These preferences have been generally studied over the last year through various surveys, but many of the stories around these employee experiences are anecdotal. The data implies that these insights have not been taken on by businesses in their planning in a quantitative way.

The specific ask:

This project will be centered on:

- analyzing and discovering the drivers behind U.S. employees' work arrangement preferences (i.e. WFH, traditional office setups, and hybrid), and
- using the resulting insights to propose an initiative targeted to specific employee groups.

A model will also be created to predict employees' working arrangement preferences.

This project will use a dataset from the Survey of Working Arrangements and Attitudes (SWAA), an ongoing survey to collect data from working-age Americans on their attitudes and experiences regarding pandemic and post-pandemic working arrangements.

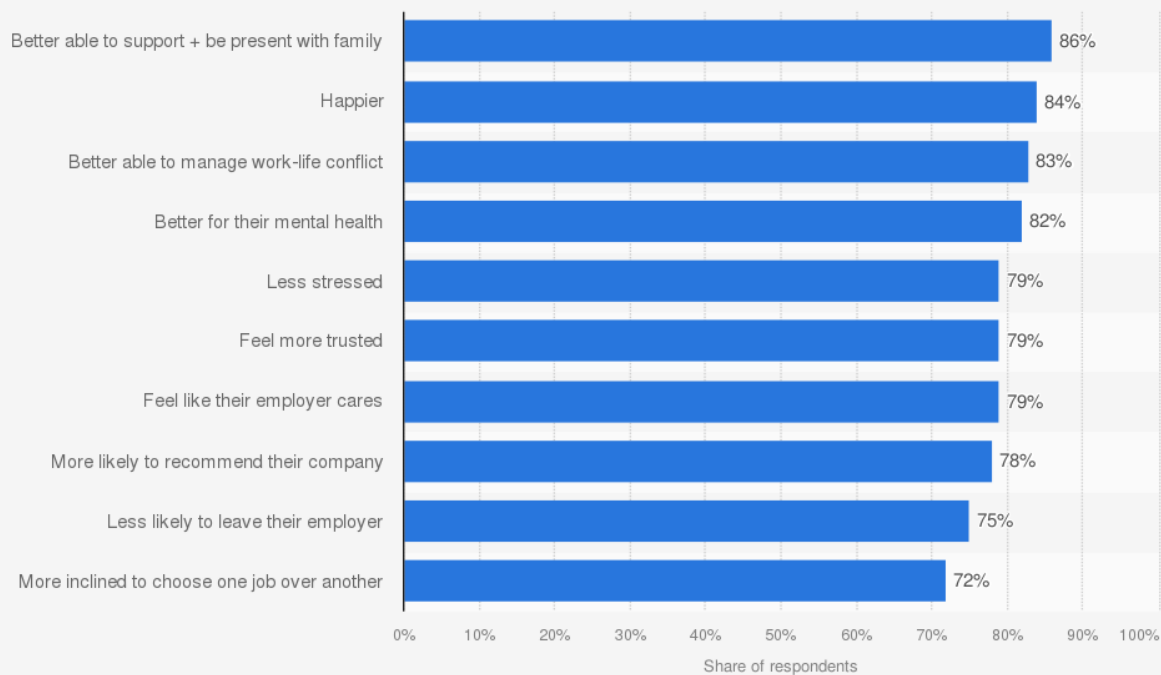
1.1 Supporting Insights

In 2020, the COVID-19 pandemic drove “a mass social experiment” in working from home (WFH) for various industries, especially among knowledge workers in the United States (Barrero et al., 2021). Now, many American businesses are implementing plans to bring employees back to the office post-pandemic. CEOs have shared their excitement about welcoming employees back to office (Sherman, 2022). Even President Joe Biden said “it’s time for Americans to get back to work” in this year’s State of the Union Address (Biden, 2022).

However, many American employees have discovered benefits in their WFH experience as seen in Figure 1.

Figure 1. Americans share the most important benefits of working from home in 2021

Most important benefits when working remotely post-COVID-19 in the United States in 2021



Sources

Global Workplace Analytics; Owl Labs
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Additional Information:

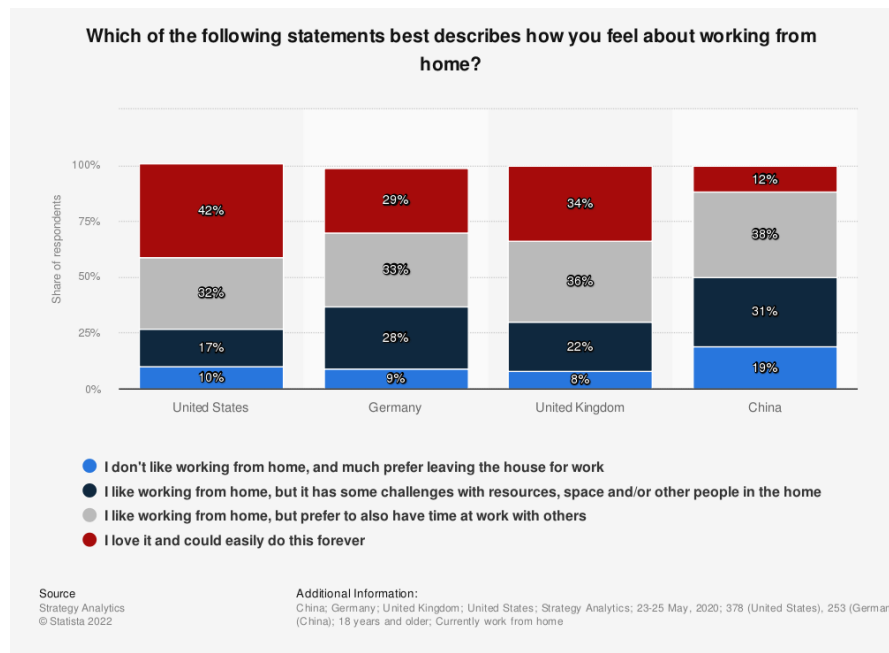
United States; Global Workplace Analytics; Owl Labs; September 2021; 2,050 respondents; Full-time employees

Source: (Global Workplace Analytics and Owl Labs, 2021).

Full-time employees feel working from home helps them support their families, manage their stress and mental health, and make them happier overall. As well, the Future Forum (2021) found that 76 per cent of employees want flexibility in where they work.

It is not a surprise then that the Future Forum (2021) also discovered that 83 per cent of non-executive employees would prefer a fully remote or hybrid work arrangement moving forward.

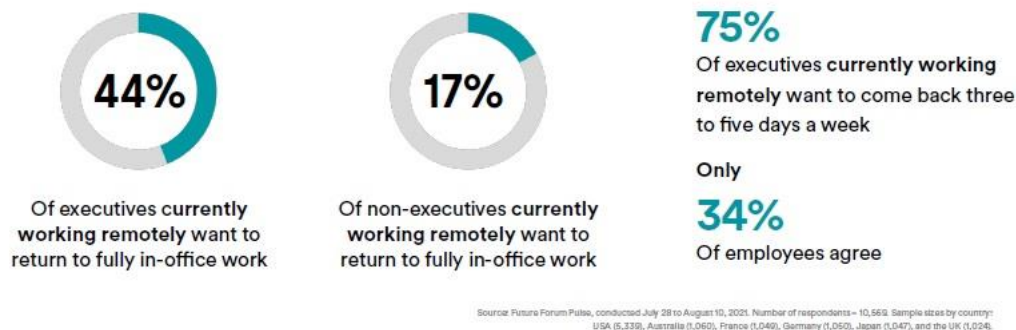
Figure 2. Strategy Analytics Consumer Insights study shows Americans' feelings about working from home due to COVID-19



This matches information from other surveys; Strategy Analytics found that at least 74 per cent of Americans would prefer working from home or hybrid work, as shown in Figure 2 (Strategy Analytics, Inc., 2020). McKinsey & Company (2022) found that “when people have the chance to work flexibly, 87 per cent take it.” Employees are actually willing to accept lower pay for a flexible work arrangement (Rosalsky, 2022).

This does not match senior executives’ enthusiasm about the return to office (Figure 3).

Figure 3. The executive-employee disconnect in working arrangement attitudes
Executives want to work in the office full time. And employees don’t.



Source: (Future Forum, 2021).

That employer-employee disconnect in working arrangement attitudes could be a sign of employee resistance to the continuing work environment changes. This disconnect is touched on in messaging from CEOs like Apple’s Tim Cook as they continue their back-to-office pilot.

In a recent company email, Tim Cook wrote, “For many of you, I know that returning to the office represents a long-awaited milestone and a positive sign that we can engage more fully with the colleagues who play such an important role in our lives. For others, it may also be an unsettling change. I want you to know that we are deeply committed to giving you the support and flexibility that you need in this next phase — a commitment that begins with this gradual introduction of our hybrid pilot and includes the option to work remotely for up to four weeks a year” (Cook, 2022, as cited in Lyons, 2022).

In fact, employee pushback to these changes have been covered by various media sources. Insider says, “workers are quitting or switching jobs in droves, leaving CEOs scrambling for top talent” (Latifi, 2022). Vox discusses how the return to office has not been working, citing reasons such as deteriorating in-office experiences and differing expectations between employers and employees (Molla, 2022).

This emerging issue could further complicate the talent shortage created by the Great Resignation that began in 2021. The exodus of employees from various companies around the world in 2021 were the result of already disengaged employees reaching a breaking point during the pandemic (Morgan, 2021). In 2021, the Future Forum found that 63 per cent of knowledge workers in the United States are open to finding a new job within the next year.

A look at the employers’ side implies that employees’ input may not have been taken on in the implementation of back-to-office plans. 66% of CEOs have said post-pandemic office policies have been designed with “little or no input from employees” (Future Forum, 2021).

Tesla CEO Elon Musk recently told employees to return to office or leave the company, leading to some strong employee reactions (Jin and Datta, 2022). Musk argued that making outstanding products in Tesla's market does not happen when people are working remotely.

In contrast, some companies are beginning to see flexible work arrangements as a competitive edge in talent recruitment. For example, Shopify (2022) has gone fully remote, advertising employee work advantages that include working abroad up to 90 days annually and being equipped with customized remote work technology.

1.2 Project Gains

As discussed in the previous section, the disconnect between employees and employers in terms of their attitudes around working arrangements could lead to issues as businesses shift their remote work environments this year.

Businesses continuing their back-to-office initiatives without addressing this disconnect could lead to increased employee turnover and decreased employee engagement. In the long-term, these effects could noticeably affect business revenues and talent recruitment. As well, it could result in losses in employee productivity.

These preferences have been generally studied over the last year through various surveys, but many of the stories around these employee experiences are anecdotal. The research implies that businesses have by and large not incorporated the data into their post-pandemic work policies.

Incorporating working arrangement initiatives with data on employees' attitudes and behaviours could reduce the impacts mentioned, and result in gains in employee engagement and productivity.

2.0 Analytics Objective

The three key questions this project aims to answer are:

1. **What are the specific drivers behind U.S. employees' work arrangement preferences, as supported by data?** This will be answered by exploring the data collected by economists for the SWAA survey (Barrero et al., 2022).
2. **With these data-driven insights in mind, what future company-wide working arrangements can be created that will bridge the gap between employers and employees?** Based on the analysis of the first key question, this project will have a section recommending an audience-targeted initiative and the details of implementation.
3. **Who is open to going back to office, and who isn't?** A model to predict employees' working arrangement preferences will also be created to meet the objectives of this project.

Key assumptions are that:

- The employees studied are working-age Americans who are knowledge workers.
- The employees make at least \$10,000 USD each year.

This project's hypothesis is that most Americans would prefer to work flexibly if given the opportunity, and that there is a happy middle where employees feel supported and employers are seeing growth.

2.1 Other related questions and Assumptions:

Assumptions affecting this analysis are:

- Employees largely have access to the tools needed to respond to the SWAA survey.
- Records are independent of each other. Outside of demographic information, the authors and users of the SWAA dataset do not have access to respondents' personal identifying information. However this assumption can be made as respondents were recruited through panel aggregators used by commercial survey providers.
- Though employees' behaviours may have changed with companies implementing different work arrangement plans, their attitudes around working arrangements have not appreciably changed since July 2021.
- The almost 56,000 records collected in the last 12 months are representative of working-age Americans who are knowledge workers.
- Answers from questions only given to a specific wave of respondents (e.g. 5,000 respondents in January 2022) are not significantly different to results if all respondents had received those questions.

2.2 Success measures/metrics

Success measures include:

- significant correlations between employee engagement and their work arrangement attitudes
- significant correlations between employee demographics and their work arrangement attitudes
- accurate classification of employees' work arrangement preferences by this project's model
- factors that clearly influence employees' attitudes about work arrangements

Metrics would be the statistics showing the accuracy of the model (confusion matrix, training data vs. valid data statistics) and positive scores on factors discovered that affect employee attitudes (and indirectly employee turnover and engagement).

2.3 Methodology and Approach

Type of Analysis: random forest classifier, decision tree model, logistic regression

The initial approach will be to use a decision tree to determine which employee attitudes point to the main drivers of their work arrangement preferences. Other techniques will be used to verify these findings.

A random forest model will also be used to determine which employee demographic variables are most significant related to an employee's likelihood to have certain work arrangement preferences. Other techniques will also be used to verify findings.

Methodology: Key questions from 'Analytics objective' will be tackled in '5.0 Timelines and deliverable section'.

This project begins by identifying correlations between employees' answers and their work arrangement preferences for the last 12 months, particularly with potential factors such as commute, family commitments and wellbeing.

A look at variables indicating plans around changing jobs will also shed some light on work arrangement attitudes' effect on employee turnover.

This project will also look at subgroups of respondents that were asked specific questions (i.e. top three benefits of working from home to respondents in 2022), and observe patterns and trends.

This project will then define the response variable to be a 1 if they want to go back to office, and 0 otherwise. A decision tree will be created to see which variables are the most important in determining whether employees prefer one work arrangement or the other. Training data will be six months of respondents, and the model will be fitted with the remaining six months of respondents.

The attitudes and related demographics will then be incorporated into proposed work arrangement initiatives for a specific employee group.

Output: The output will be (1) a set of insights and strategic recommendations for future initiatives and (2) a model that will help an employer evaluate the likelihood of an employee's work arrangement preferences.

3.0 Population, Variable Selection, considerations

Audience/population selection: 56,062 American respondents of working age

Observation window: July 2021 to June 2022

Exclusions:

- Early data of the survey, which has skewed data on the employees' industries
- Variables on fear of COVID-19 infection
- Not excluded, but to monitor: party affiliation of respondents (Democrats, Republicans)

Data Sources: Survey of Working Arrangements and Attitudes data (Barrero et al., 2022).

Audience Level: Executives and senior managers developing and implementing post-pandemic work arrangement policies

Variable Selection:

- Dummy variables will be created from survey questions that were categorical in nature.

- Due to the relatively extensive data exploration, the variables are continuing to be selected at the time of initial analysis plan submission.

Derived Variables: WFH_preference

Assumptions and data limitations:

- These are working age Americans who have an income of at least \$10,000 USD per year.
- Some questions that were asked in only 1-3 months of survey collection will have trends that reflect the whole population.

4.0 Dependencies and Risks

Risk	Likelihood (based on historical data)	Delay (based on historical data)	Impact
Results do not reflect all working-age Americans, because of the need for access to digital devices to use the data collection tool.	Low	All these risks will mean more time is spent on exploratory data analysis than is usual for similar projects.	This will be low as data shows 96 percent of people between 18 to 29 years of age, 95 per cent of people between 30 to 49 years of age, and 83 per cent of people between 50 to 64 years of age own a smartphone (Faverio, 2022). Since this project does not cover Americans who are older than working-age (who often have less access to technology), this will also reduce the impact.
Bias of respondents in answering surveys	Moderate		As the analysis continues, bias will be addressed by exploring analyses of subgroups of respondents. As well, the number of respondents will help mitigate this risk.
Attitudes of respondents have changed dramatically in the last six months	Low		Trends between waves of respondents will be studied for any sudden shifts in employee attitude breakdowns.

5.0 Deliverable Timelines

Item	Major Events / Milestones	Description	Deliverable	Days	Date
1.	Kick-off / Formal Request	Requirements for this project were outlined.	<i>Attendance of the initial lecture, connect with adviser</i>	1	Tuesday July 5, 2022
2.	Assessment / Triage	Data set is assessed for viability, as well as research questions and objectives.	<i>Research questions, objectives, initial data exploration</i>	7	Wednesday July 6 to Tuesday July 12, 2022
3.	Prioritization	Selection of data	<i>Analysis plan</i>	10	Wednesday July 6 to Friday July 15, 2022
4.	Data Exploration & Analysis	Issues with duplicates, blanks and data quality are found, as well as any factors biasing the analysis.	<i>Analysis plan</i>	17	Wednesday July 6 to Friday July 22, 2022
5.	Model	Classification model constructed and fitted	<i>Model</i>	7	Saturday July 23 to Friday July 29 2022
6.	Governance	Covering replicability and applicability of the model	<i>Governance plan</i>	2	Monday August 1 to Wednesday August 3, 2022
7.	Documentation	Compilation of the project	<i>Documentation</i>	5	Thursday August 4 to Monday August 8, 2022
8.	Presentation	Slide deck and presentation of the project and proposal	<i>Slide deck, presentation to stakeholders</i>	8	Tuesday August 9 to Tuesday August 16, 2022
9.	Revision	Incorporating any needed revisions to the analysis	<i>Revised project case analysis, model and slide deck</i>	6	Wednesday August 17 to Sunday August 22, 2022
10.	Delivery and sign-off	Wrapping up the project	<i>Revised project case analysis, model and slide deck</i>	1	Sunday August 22, 2022

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