Chapter

Deployment of Accounting Analytics Models for Workforce and Project Management

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Abstract

We provide several innovative industry solutions and analytical tools for our industry partner, HANDS Enterprise Solutions, to better assess their cost structure and improve their HR policies using various big data analysis and data visualization tools. Based on our analysis, we identify several areas of weakness in their HR policies, highlight salient points to buttress their internal control policies, and provide policy recommendations for future improvement and analysis. Overall, we have improved the quality of the company's claims submission. The productivity improvement is applicable for both their consultants and staff, and the improvement in cost control can be observed at both the project and employee levels.

Keywords: big data analysis, data visualization, work efficiency, productivity, project management, internal control

1. Introduction

Traditional accounting has primarily focused on providing factual and retrospective reports. While this approach helps executives analyze past outcomes and make adjustments to their strategic and operational plans, it does not necessarily assist them in predicting future events and making proactive plans.

It is crucial to find appropriate solutions that enable a thorough examination of financial data when transitioning from a historical perspective to forward-looking business intelligence (BI). Implementing a BI solution allows for the identification of patterns within consolidated data, rather than relying on fragmented and ad-hoc processes from separate information systems. This approach uncovers hidden trends and offers valuable functionality for predictive analytics. For instance, in customer relationship management (CRM) systems, improved forecasting is vital for effectively planning for capacity fluctuations that directly impact customer experience, response time, and transaction volumes.

Data analytics has become a routine practice for accountants, who use calculations such as sums, averages, and percent changes to report on sales performance, customer credit risk, cost per customer, and inventory availability. Accountants are also familiar

with diagnostic analytics, as they conduct variance analyses and employ analytic dashboards to explain historical outcomes.

In the coming years, there is a growing trend toward attempting to predict financial performance and utilizing nonfinancial performance measures as potential indicators of financial success. This presents a significant opportunity for accountants to play a more valuable role in management. Therefore, accountants should continue harnessing data analytics' power to effectively fulfill their responsibilities.

2. Analytical tools and solutions

2.1 Predictive analysis in accounting processes

Predictive analytics and prescriptive analytics play a crucial role in providing actionable insights to companies, making it essential for accountants to enhance their proficiency in these areas to add value to their organizations. Predictive analytics involves integrating data from various sources, such as enterprise resource planning, point-of-sale, and customer relationship management systems, to forecast future outcomes based on statistical patterns discovered in historical data using regression-based models. A common application of predictive analytics is calculating a credit score to assess the likelihood of timely credit payments in the future. On the other hand, prescriptive analytics employs advanced optimization techniques, including self-optimizing algorithms, to generate recommendations on the most favorable courses of action to be taken.

The specific analytics skills required for accountants may vary depending on whether they are responsible for producing or consuming information. Analytics production entails sourcing relevant data and conducting analyses, making it a more suitable task for junior-level accountants. Analytics consumption, on the other hand, involves utilizing insights derived from analytics in decision-making processes and is particularly relevant for senior-level roles. Accountants do not need to completely transform into data scientists or computer engineers to leverage analytics tools. However, the audit and accounting professions must become more adept at consuming analytics. This proficiency will enable them to enhance their existing audit practices using available technologies and support their clients in undertaking data analytics activities.

2.2 Accounting analytics applications in audit processes

Audit Data Analytics (ADAs) help auditors discover and analyze patterns, identify anomalies, and extract other useful information from audit data through analysis, modeling, and visualization. Auditors can use ADAs to perform a variety of procedures to gather audit evidence, to help with the extraction of data and facilitate the use of audit data analytics, and a tool to help illustrate where audit data analytics can be used in a typical audit program.

Governance, risk and control, and compliance monitoring systems commonly used by larger companies include systems developed by Oracle, SAP, and RSA Archer. Oracle and SAP have application-side business intelligence systems centered on business warehouses. Lavastorm, Alteryx, and Microsoft's SQL server provide advanced tools for specialists such as business analysts and, increasingly, for non-specialists. All these platforms are currently the preserve of large systems integrators, larger and mid-tier firm consultancies, and specialist data analysts. It seems likely though, that

over time these systems will move in-house or be provided as managed services. It also seems likely that companies such as CaseWare and Validis currently provide data analytics services to larger and mid-tier firms, enabling those firms to offer data analytics services to their clients.

Some businesses already similarly analyze their own data for auditors. As these business analyses become deeper, wider, and more sophisticated, with a focus on risk and performance, it seems likely that they will align at least in part with the risks assessed by external auditors.

Data analytics is rooted in software originally developed in the early 2000s for data mining in the banking and retail sectors and for design and modeling in financial services and engineering. What is astonishing about this process is the volumes of data that can be handled efficiently on an industrial scale, and the speed of calculations being performed in a fraction of a second. The type of tasks such software can perform, and the connections it can make, dwarf what was previously possible. These technological improvements have facilitated the advances that we have seen in data analytics software.

2.3 Current applications

By using accounting analytics procedures, accountants and auditors can produce high-quality, statistical forecasts that help them understand and identify risks relating to the frequency and value of accounting transactions. Some of these procedures are simple, others involve complex models. Auditors using these models will exercise professional judgment to determine mathematical and statistical patterns, helping them identify exceptions for extended testing. Auditors commonly use data analytics procedures to examine:

- Receivables and payables aging
- Analysis of gross margins and sales, highlighting items with negative margins
- Analysis of capital expenditure versus repairs and maintenance.
- Matching of orders and purchases
- Testing of journal entries

While data analytics techniques may not completely replace traditional audit procedures and techniques, they can serve as powerful facilitators that enable auditors to perform procedures and analyses that were previously unfeasible. For instance, the three-way match process is a fundamental audit procedure. Traditionally, auditors would sample test this procedure, as it is neither practical nor expected for them to verify every transaction document. However, data analytics techniques now empower auditors to analyze all recorded transactions, potentially identifying a specific class of transactions with unmatched items. Additionally, data analytics tools enable auditors to trace revenue transactions to debtors, analyze subsequent cash receipts, and examine payments made after the period ends. By cross-referencing delivery dates extracted from underlying documents, auditors can determine if payments correspond to goods delivered before or after the period ends and identify any unrecorded liabilities.

The auditing and accounting professions have invested significant resources in understanding the impact of various data visualization techniques on decision-making and analytical procedures. As technology evolves and data sizes and volumes continue to grow, new ways of presenting information are emerging. Therefore, it is essential for accounting and auditing research to explore these newer data visualization techniques.

The primary objective of data visualization is to assist users in gaining better insights, drawing more accurate conclusions, and ultimately developing hypotheses. This is achieved by leveraging the user's perceptual abilities during the data analysis process, as well as applying their flexibility, creativity, and general knowledge to the vast datasets available in modern systems. Data visualization offers several advantages, such as presenting data concisely, facilitating faster exploration of large datasets, and providing intuitive tools that do not require an understanding of complex mathematical or statistical algorithms.

Constant advancements in software development aim to assist users in effectively managing the growing volume of data generated by businesses. Accounting firms and private businesses are increasingly adopting new business intelligence (BI) tools like Tableau, Power BI, and QlikSense. Auditors have started utilizing visualizations as a means to examine multiple accounts across multiple years and identify potential misstatements. These tools can be applied in risk analysis, transaction and controls testing, analytical procedures, supporting judgments, and providing valuable insights. Many data analytics tasks can now be easily performed by auditors with minimal or no involvement from management, emphasizing the importance of independent analysis. Detailed analyses offer audit evidence and insights, while higher-level routines aid in risk analysis to detect issues.

Data visualization tools also hold great potential in enhancing communication during audit engagements. They enable the summarization and presentation of information engagingly and sufficiently. By incorporating visual presentations, essential information can be conveyed at a glance, making reports easier to read and understand. The inclusion of visualizations can strengthen the impact of opinions by providing factual representations rather than relying solely on descriptive statements to support them. Introducing visualization techniques allows auditors to focus on key figures that effectively convey the intended message. Working with data is essential in external audits, ensuring auditors develop a comprehensive understanding of their clients and effectively plan high-quality audits.

With the rapid pace of innovation, data visualization is likely to become an integral aspect of the roles of many accountants and auditors. To fulfill their responsibilities of reporting on the past and providing timely assurance and insights about the future of businesses, accountants and auditors need to effectively utilize vast amounts of data. Employing dynamic accounting analytics and visualization tools becomes crucial in enhancing the impact of their opinions and recommendations. Therefore, the accounting profession must embrace and implement dynamic reporting and visualization techniques that address the challenges posed by big data, ultimately producing results that have a meaningful influence and impact.

3. HAND enterprise solutions

HAND Enterprise Solutions (HAND) is a leading global software solutions provider working to deliver IT strategy, ERP solution implementations, and global

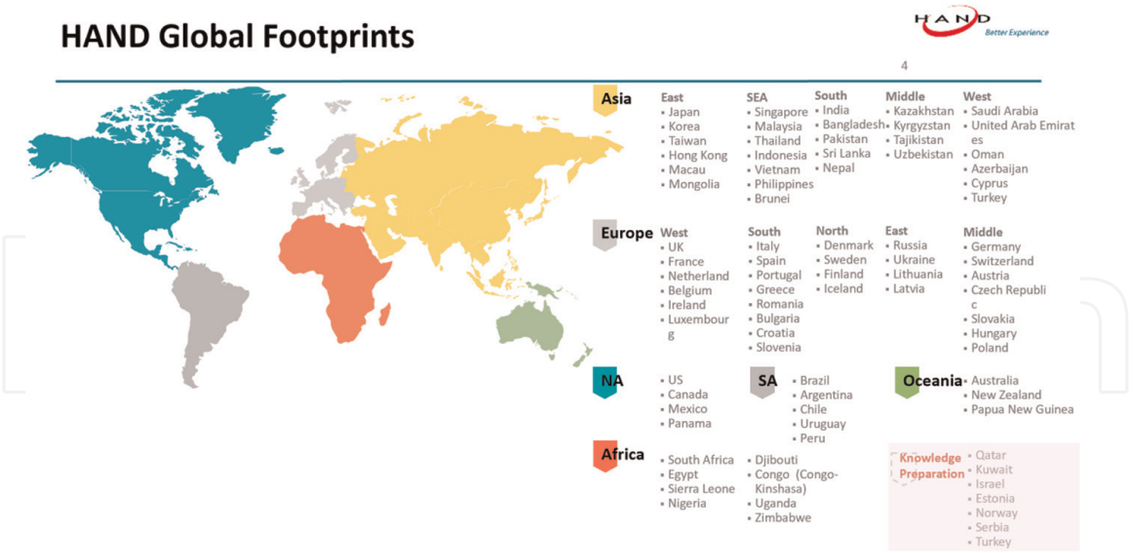


Figure 1.
HAND global footprints.

technical support. The company leverages its offshore and onshore teams from around the world to provide its customers with the most competitive, convenient, and reliable experience. HAND is publicly listed on the ChiNext, a NASDAQ-style board of the Shenzhen Stock Exchange (stock code: 300170).

The company has end-to-end IT delivery solution capabilities with 23+ years' experience in enterprise IT solutions design and building up, and 30+ industrial and packaged solutions, focusing on the traditional areas while keeping pace with innovations in the niche market.

HAND has 10,000+ professional IT consultants, 4,000+ enterprise customers, and 7,000+ successful project cases delivered and supported. The Group operates 11 major domestic bases, 5 overseas subsidiaries (e.g., U.S., Japan, Singapore), 10 participating holding companies, and global IT partners (refer to **Figure 1**).

HAND is recognised as the Best SaaS ERP Solutions Provider of the year 2017 in Asia by ORACLE. With a track record of over 80+ live projects in ORACLE Cloud, their customers value HAND for their rapid deployment capability and cost-effectiveness for ORACLE ERP projects.

HAND is also one of the world's leading SAP partners. As an SAP Platinum Partner, their experts effectively deploy, develop and support this market-leading software. HAND offers implementation and consulting services for SAP products including S/4HANA, S/4HANA Upgrades, Hybris solutions, and SAP Cloud-for-Customer (C4C).

Though the digital infrastructure has enabled the company to build up a sheer volume of financial and operational data, there is a lack of accountancy domain specialists to guide the firm to adopt a structured approach to make use of big data and analytics techniques to enhance their contribution to businesses. By integrating accounting profession expertise into big data analytics, we help the company and its clients to:

1. Create a dashboard for easier visualization of the trends of financial and non-financial data to better understand the company's cost behavior on a project or consultant basis.

2. Use predictive models and other sources of data to improve project expenses budgeting and forecasting.

3. Use more sophisticated outlier and exception analysis to improve internal control and risk management.

4. Improve the efficiency and quality of internal audit activities through the analysis of whole data sets.

3.1 Industry-specific solutions

Expenses management software is developed to replace rudimentary processes in the approval and reimbursement of expenses claims. Such software automates these mundane tasks with built-in controls, reduce human errors and integrate interface with the accounting system to facilitate expense monitoring and reporting.

As an example, HAND Enterprise Solutions use Helio, an expense management apps to simplify and automate the receipt to reimbursement process for their employees' claims on project-related expenses. Employees can submit travel bookings, T&E expenses, transportation, meals & accommodation, and miscellaneous expense claims. This software helps businesses in ensuring compliance such as external compliance with tax policy or tracking internal compliance with company policies, and cost control by designing built-in features to detect or mitigate violations in the apps. Specifically, data from transportation and meal claims with apps from on-demand or sharing companies such as DIDI is fed into their accounting system to streamline the reporting process. Such integration with other applications affords seamless data transfer, saving the hassle of toggling between different systems to manually import, export, or data entry.

3.1.1 Expenses management software ranking

According to Capterra, a software review site that provides user reviews and ratings for expense tracker apps designed for businesses. The most popular and highest-rated products on expense tracker apps are summarized in **Table 1**.

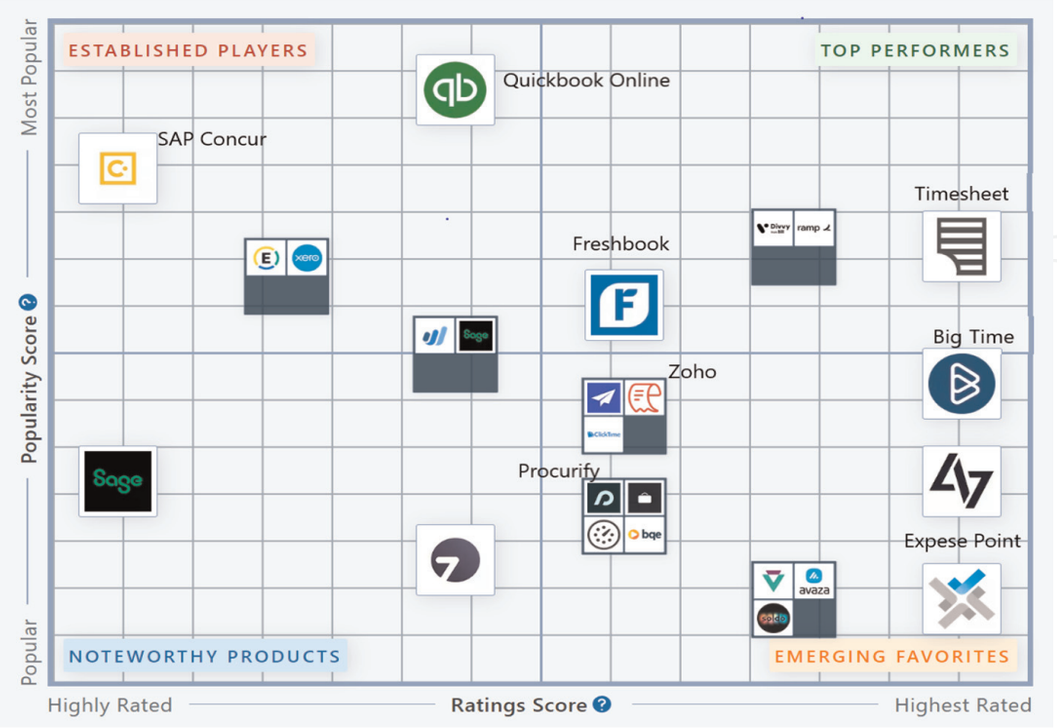
Of these products featured in Capterra, another market review report on expenses tracker apps by Gartner [2] listed the following:

SAP Concur is popular as it caters to small businesses to Fortune 500 clients [3]. It was reviewed as a mature tracking product. Concur was acquired by SAP [4] in 2014 and therefore able to integrate easily into the established SAP ERP & extended suite which consists of SAP Analytics Cloud Solutions in the Financial Planning Module and Machine Learning Platform. Helio is the Chinese and ASEAN version of SAP Concur.

SAP Analytics Cloud (SAC) is a business intelligence (BI) platform that offers data analytics, planning, and predictive capabilities. However, it is not a self-service BI tool like Tableau or MS Power BI.

3.2 Improving Helio

Under the application of the new Internet technology, the traditional accounting information system based on accounting vouchers has been greatly expanded around the accounting information system, there are many other relevant data information



Source: Capterra [1].

Table 1.
Top expense tracker software apps.

that can be obtained. This provides a new idea and tool for every commercial enterprise to adopt the new big data analysis method, strengthen enterprise control and reduce unnecessary costs. Based on big data, quantitative analysis, refining, and architecture of the data model will in turn provide a reference control model for the vast majority of enterprise managers.

Aside from big data analysis for cost behavior analysis and cost control purposes, to fully harness the power of data analytics, future projects and studies can analyse incoming data, such as sales records, marketing patterns, and growth metrics of the company, create dashboards for easier visualisation of the trends, deploy data analytics to support the making of critical business decisions that include inventory planning, payment and collection cycles reviews, revenue and cash flow prediction, new product development, investigation of supplier or production issues, formulation of product pricing and promotion strategies, developing a balanced scorecard encompassing both financial and non-financial performance metrics.

Our research team helps HAND develop models using big data analytics and machine learning techniques to innovate HES specialized products: EasiShare, a secured document management system, and Helios, an expense tracker App. Helio is the Chinese and ASEAN version of SAP Concur. Helios aims to innovate integrated travel and expense management services and solutions for organisations of all sizes, industries, and locations. Our models will be used to help HES to develop four major products: (1) Expense products, (2) Travel products, (3) Invoice products and, and (4) Data insights product.

3.3 Suite of services

Helio will be the pilot product with user testing from HAND itself first, once successful and completed, will be licensed, customized and sold to HAND's existing clients in terms of consultancy service and as Business Intelligence products (a fully developed product to be installed, implemented, and evaluated at clients' user end). The models we aim to develop from this project will improve the management control system for both HAND and its clients from the following perspectives:

a. Expense control: easily track, analyse, and report business travel spending that enables a seamless flow of data to bring a new level of control over and visibility into business expenses; integrate company expense policies and custom auditing software to improve compliance and visibility; the App is mobile and web-based that will automate, accelerate and improve expense management from start to finish.

b. Budgeting control: empower the budgeting process by capturing and consolidating data for a holistic view of employee spending across the organization and projects, controlling and adjusting budgets to changing business needs, and improving the accuracy and timeliness of spend.

c. Internal audit: certify each expense again the company's policy; identify non-compliant expenses before reimbursement; ensure all employees are compliant; consult on best practices.

d. Location control: identify risks and assess their impact; pinpoint employees' locations and know their travel plans to easily monitor how events and incidents are impacting employees and projects

3.4 Data cleaning

Our industry partner provided several large datasets tracking information on claims as well as projects (in progress and finished), linking each claim to each employer, the corresponding project, and detailed categories. We first cleaned the data by removing missing, duplicated, and inconsistent data, and study the summary statistics of the dataset to have the big picture. In the summary statistics tables, we included a number of observations and frequencies in percentage under each claim category. To understand the claim data better, we also categorize the detailed claims according to the distance between the current location and the claim location, and when the distance is too far, whether there is a reason being provided.

By conducting a comprehensive analysis of claim information, we can gain valuable insights into the overall claim pattern. This deep dive into the data enables us to identify any recurring trends or anomalies that may have gone unnoticed otherwise. Such an in-depth examination of claim information can also reveal any potential issues or areas for improvement in the claims process, leading to more effective and efficient handling of claims in the future. In essence, this detailed analysis provides us with a holistic view of the claims landscape, allowing us to make informed decisions and take appropriate actions as necessary. Upon scrutinizing the data patterns, we have put forth the risk categories that require further analysis in the following session.

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3.5 Risk Identification

We propose potential alerts (risk triggers) in the system for further investigation. The basis of proposed alerts is based on the information from the various reasons provided by HAND about suspicious claims or potential violations of fraudulent claims. Discussed the weakness of the internal control during the employees' claim procedure. They find that claims on mileage, petrol and accommodation are the most occupational frauds, and we observe similar patterns in our data. Fernandhytia and Muslichah [5] identified the positive relationship between internal control and accounting fraud, governed by the shared individual morality and ethical values. With the rich dataset provided, we are extending the literature by providing more detailed analysis with features such as when the employees make the claim, reasons for the claim, and the locations when they submit the claims.

We first study the integrity and authenticity of the various claims by analyzing the physical distance from the project that the staff is supposed to work on.

Figure 2 shows the portion of the observation on the aggregate level at each Distance to the Project level. Our preliminary results suggest that 79% of the claims are within 1 km of the project that the staff is supposed to work on, and 18% of the claims are within 10 km of the project that the staff is supposed to work on. Hence, 3% of the claims are made from 10 km and further from the project that the staff is supposed to work on. To analyze the reasons for employee expense claims at various distances from project locations, we use different cut-off points for distance ranges. The analysis shows that for shorter distances, most claims had no reason specified, while for longer distances, "Others" and "Urgent Travel" were the most cited reasons. At the aggregate level, most claims were made at the project location, while for longer distances, claims were flagged for further investigation if there were no valid reasons provided.

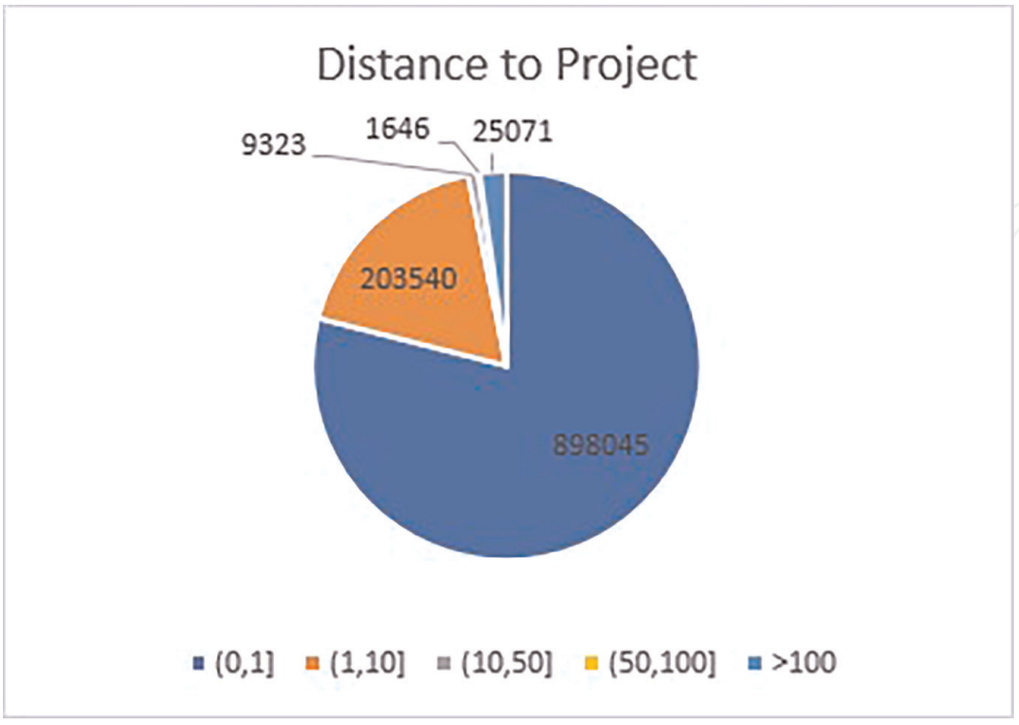

Figure 2.
Observations at each distance to the project level.

Besides the number of observations, we examined the distribution of employee expense claims in local currency under different distance to project categories. We find that the median was lower than the mean, indicating extremely large claims that shifted the distribution to the right tail. For larger claims made within the project duration, employees tended to claim without providing a reason if the distance was small. The distribution of claims for distances greater than 1,000 km was also examined, with claims under (10,50] being relatively larger. For small claims made within 1 km, employees generally did not provide a reason. The total claim amount in local currency was found to be distributed differently for each distance to the project level.

With the analysis above, we identify 12 different alerts. To make the analysis robust, we explore different alerts identifications:

1. *tooFar50* is defined as one if *Distance.to.Project.Location>50*, and zero otherwise.

2. *tooFar100* is defined as one if *Distance.to.Project.Location>100*, and zero otherwise.

3. *NoReason50* is defined as one if *Distance.to.Project.Location>50* and the reason is missing, and zero otherwise.

4. *OtherReason10* if *Distance.to.Project.Location*>10 and the reason is Others, and zero otherwise.

5. *LocationErrorTooFar10* is defined as one if the reason is Phone Location or the reason is Office Location, and *Distance.to.Project.Location>10*, and zero otherwise.

6. *LocationErrorTooFar100* is defined as one if the reason is Phone Location or the reason is Office Location, and *Distance.to.Project.Location>100*, and zero otherwise.

7. *UrgentTravelTooClose* is defined as one if the reason is Urgent Travel and *Distance.to.Project.Location<10*, and zero otherwise.

8. *Late* is defined as one if the claim is submitted after the close of the project.

9. *MileageLessOne* is defined as one if *Mileage*<1, and zero otherwise.

10. *IsWeekend* is defined as one if the expense is occurred during weekends, and zero otherwise.

11. *IsHoliday* is defined as one if the expense is occrurred during the Chinese Public holidays, and zero otherwise.

12. *ExpPerKMtooLarge* is defined as one if ExpPerKM>10, and zero otherwise.

In our risk analysis, we are focusing on the extreme values, and therefore the summary statistics include more details in the distribution tails, including minimum, 1%, 10%, 25%, 50%, 75%, 90%, 99% and maximum values, both in number of observed risks and the dollar amount.

3.6 Risk prediction

Although the frequency of alerts are low, we oberved a trend that staff who received alerts previously has a higher changce to be alerted again. To test this hypothesis, we use logit regression in the following model:

$$P(x_t = 1) = 1/\left(1 + e^{-a-bx_{t-1}}\right) \tag{1}$$

where x_t represents the alert (dummy variable) at time t while x_{t-1} represents the previous claim submitted by the staff, with staff and year-month fixed effects being controlled. In predicting the future risks (dependent variable), we use the previous observed variables (independent variables) as controls. On average, the staff that has previously being identified by the alert has a higher chance to repeat the same alert in the future, statistically significant at 1% for most of the risks being identified.

While we find the immediate previous alerts help us to explain the same future alert, we explore the past period and check if the pattern of claim persists longer. To test this hypothesis, we use logit regression in the following model:

$$P(x_t = 1) = 1/\left(1 + e^{-a-b\left(\sum_{i=1}^{10} x_{t-i}\right)/10}\right) \tag{2}$$

where $\left(\sum_{i=1}^{10} x_{t-i}\right)/10$ represents the moving average of the past 10 claims the same staff submitted, with staff and year-month fixed effects being controlled. We find that on average, the staff that has previously (previous 10 claims) being identified by the alert has a higher chance to repeat the same alert in the future.

We continue to test the likelihood that the past alerts' positive impact on the future alert using the alert created from expense data. The following alerts are identified from expense data:

1. *MileageLessTwo* is defined as one if *Mileage*<2, and zero otherwise.

2. *ExpPerKMtooLarge* is defined as one if *ExpPerKM*>10, and zero otherwise.

3. *IsWeekend* is defined as one if the expense is occurred during weekends, and zero otherwise.

4. *IsHoliday* is defined as one if the expense is occurred during the Chinese Public holidays, and zero otherwise.

Similarly, we find that on average, the staff that has previously being identified by the alert has a higher chance to repeat the same alert in the future.

3.7 Cost seasonality

We use the following parameters to understand the seasonality effect based on both calendar and project durations:

1. *Cost* is defined as the claim amount in percentage of the total project cost.

2. *TSduration* is defined as the date of last claim of the project minus the date of the first claim of the project in the sample.

3. *Dur1* is defined as one if the claim happens during the first 1/3 of the duration of the project.

4. *Dur2* is defined as one if the claim happens during the 2/3 of the duration of the project.

5. *Du3* is defined as one if the claim happens during the last 1/3 of the duration of the project.

6. *lastQ* is defined as one if the claim happens during the last quarter of the year.

7. *Oct* is defined as one if the claim happens in Oct.

8. *Nov* is defined as one if the claim happens in Nov.

9. *Dec* is defined as one if the claim happens in Dec.

10. *Cdur1* is the claim amount in the first 1/3 of the project.

11. *Cdur2* is the claim amount in the second 1/3 of the project.

12. *Cdur3* is the claim amount in the last 1/3 of the project.

13. *PCdur1* is the percentage amount in the first 1/3 of the project.

14. *PCdur2* is the percentage amount in the second 1/3 of the project.

15. *PCdur3* is the percentage amount in the last 1/3 of the project.

16. *StaffNO* is the total staff number of the project.

17. *Cost/staff/day* is the total claim amount divided by total number of staffs divided by the *TSduration*. We removed the projects that has a duration less than 30 days.

There are 5790 projects under the cost analysis, and we find that the average percentage cost of the first 1/3 is 39.67%, which is slightly higher than the second 1/3 of the project window (26.89%) and the third 1/3 of the project (33.23%). We examine the percentage costs during different project windows in the following model controlling for staff and year fixed effects:

$$\frac{Claim}{Cproj} = a + b * window + controls, \tag{3}$$

where window is identified as which 1/3 part of the project, whether it is done during the last quarter, or in October, November, or December. We find that in

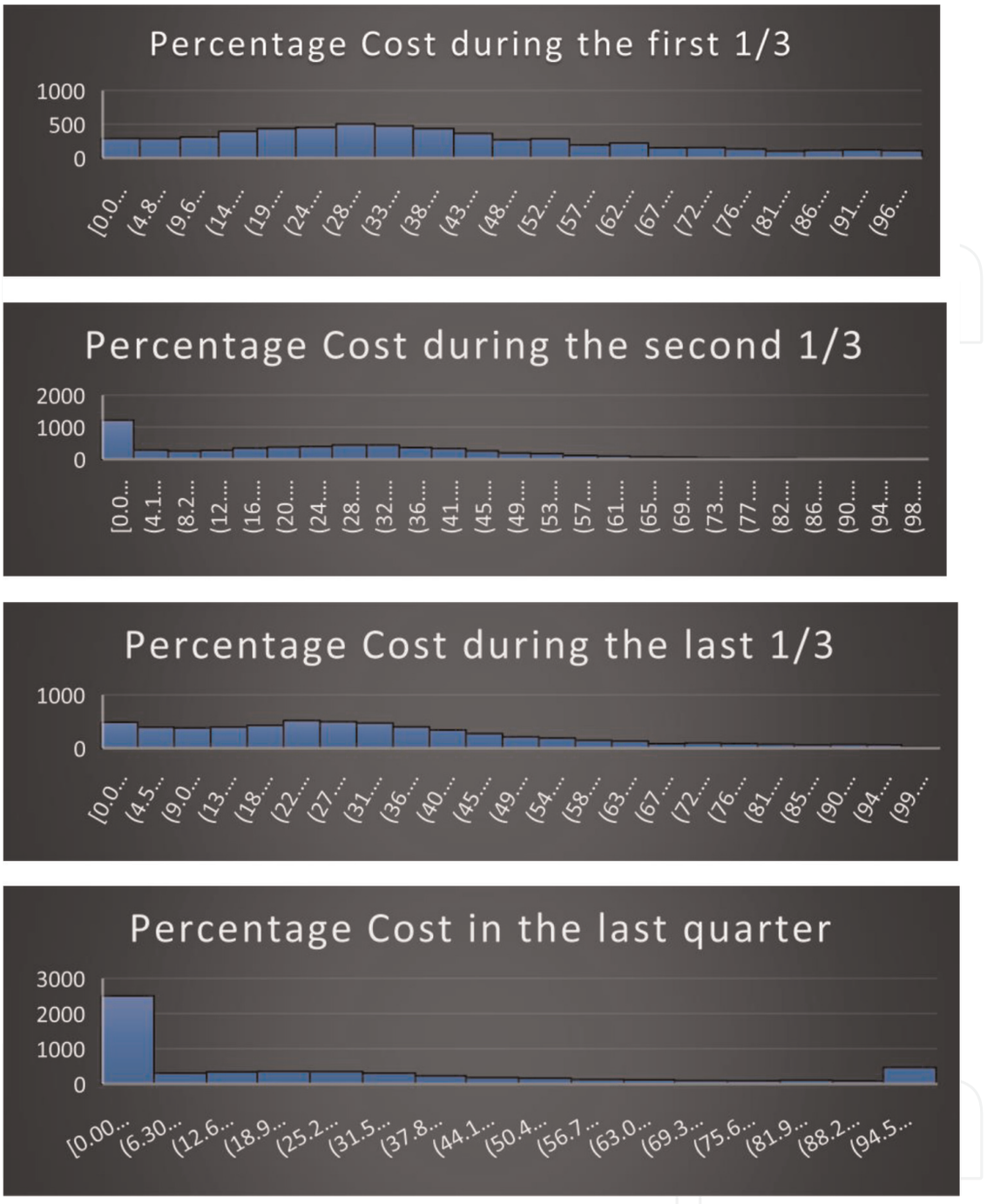

Figure 3.
Cost seasonality distribution.

general, the first 1/3 reports a relatively higher percentage costs compared to the rest periods. In the last quarter of the project, the percentage claim tends to be less. Towards the year end, there are no significant results except that the claim tends to be less in Oct.

Figure 3 shows the distribution of the percentage cost during each of the identified periods. The mode of the first 1/3 of the project window is larger than the second and third 1/3 of the projects. The percentage costs in the last quarter are polarized, where we observe heavy tails on both sides of the distribution.

3.8 Limitations

While we endeavor to optimize the raw datasets provided to us by HAND, we noted that there are some limitations to our study. The most important data limitation is that revenue information pertaining to the individual projects is not given to us due to confidentiality reasons.

This constraint limits our analyses to cost analyses; we are unable to glean data-driven insights from profitability analyses or to compare their profit margins with the costs incurred for each individual project. We also note that there is a delay in the time it takes for us to obtain the data to run our analyses. This is due to unforeseen circumstances such as the covid-19 pandemic and system integration issues. Some of the data items are also missing, and the data quality is generally not optimal and requires some data cleansing effort. In terms of the breadth of the dataset, the time series of the data is limited to 8 calendar quarters (i.e., 1Q 2020-4Q 2021). In addition, not all data items are provided. Finally, we are not able to obtain data from 1Q 2022 onwards due to the Shanghai lockdown from the covid-19 pandemic. Hence, we are unable to conduct some of our forecasting tests as we originally envisaged.

Notwithstanding these data limitations, our data analyses help to shed light on some of the cost measures that the company can focus on to optimize their cost control procedures and trim unnecessary costs.

4. Conclusion

To enhance cost structure assessment and optimize HR policies, we offer HANDS Enterprise Solutions, our industry partner, a range of innovative industry solutions and analytical tools. Leveraging big data analysis and data visualization tools, we conduct a thorough analysis that identifies areas of weakness in their HR policies. We emphasize key points to strengthen their internal control policies and provide recommendations for future enhancements and analysis. As a result, we have significantly improved the quality of the company's claims submission process. The productivity enhancements extend to both their consultants and staff, while the improvements in cost control are evident at both the project and employee levels.

Aside from big data analysis for cost behavior analysis and cost control purposes, we believe that future projects and studies can analyse incoming data, such as sales records, marketing patterns, and growth metrics of the company, create dashboards for easier visualization of the trends, deploy data analytics to support the making of critical business decisions that include inventory planning, payment and collection cycles reviews, revenue and cash flow prediction, new product development, investigation of supplier or production issues, formulation of product pricing and promotion strategies, developing a balanced scorecard encompassing both financial and non-financial performance metrics.

We also believe that there is great potential to expand this IT solution across different industries. Specifically, we are optimistic that we can use artificial Intelligence and big data solutions in corporate finance transaction services, utilising real-world settings to explore opportunities for regulators to maximising the impact of big data and to focus their resources more effectively and identify which companies warrant further investigations.

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