Meals & Entertainment Analysis

Tax Type   Tax Code

lodging
transportation
phone
supplies
business club fees

team building meals
celebration meals
mentoring meals   100% deductible
intern event meals
internal meeting meals
breakroom food
catered meals
delivered meals
overtime meals
for sale meals
meal gift < $25
benefit dinners

travel meals
group meals
per diem   50% deductible
recruiting meals
third party meals

gift value > $25
social club dues
luxury suites   0% deductible
cruises
event ticket fees

Employees submit time and expenses

Expenses are not being adequately controlled   *most CFOs, Tax and Internal Audit express concern*

Policy Enhancements

Review analytics and implement new policies

Example transformations:
Video conferencing in high travel locations
Strategic contractor usage
Bring your own devices (provide SIM)
Transport/Lodging sharing
Preferred vendor agreements
Stronger policies for booking agent to follow
Possibly shift more/certain workers to virtual

Automatic Tax Encoding

Relationship to taxpayer   *substantiation & documentation*

Business purpose

Time and place   *analyze every receipt for 100% coding opportunity*

Amount of expense

identify all 100% deductible meals

flag expenses not deductible

this is not a T&E replacement technology (enhances current systems)

<div>

</div>

few examples

Work from home   *Incent employees*   *Incent*
certain days   to avoid flying   employees to
                         on certain weekdays   book in advance

Look at bring your own device options

off-ramp copy of T&E data only

Home to work travel expenses   Expensive Days to Travel   Last minute flights booked   Work supplied devices expense

why time and not just expenses? time used to validate some expenses
including time is optional can work with expenses only

Policy Governance

Educate employees on tax free options   Improve employee knowledge of policies

Increase visibility of compliance checks

Deductibility

Cost reduction through tax savings

Federal
State
Local

Reassign expenses
Increase deductions
Manage tax risk

Preferred vendors
Entertainment expenses

Transportation analysis

Connect directly to client system
Export to M&E Analysis System

Device & data usage

Travel Patterns

Worker location

Examples: Concur, Oracle i-expenses, sdworx etc.

Reporting Levels

Basic ————————————————————————————— *Advanced*

Data Exports	Dashboard/ Scorecard	Predictive Analytics	Prescriptive Analytics	Machine Learning
Spreadsheets Metrics Basic reports	*Cockpits Visualizations Set metrics*	*Planning Cost reduction Future implications*	*Modelling Auto decisions Automation*	*Data mining AI Decision science*

Examples: XML Text/ASCII CSV etc.

Expense Analytics

Can also include worker analytics (if time sheets are imported into system)

Cost reduction through policy enhancements

This is not sampling or spot-checking
Every expense row is analyzed

Every expense line is tested against policies

Workbench

client admins can tune rules add compliance ranges without coding knowledge

Cost reduction through client customizations

Agility & flexibility

clients can choose a one time policy review or ongoing analysis on all expense reports

T&E Data Injector
Data Quality Check

Monitor of all expenses - 24 x 7
this is not software as a service
data is far to sensitive to store on internet
software is collocated inside client firewall

Ingest data automatically
Map fields to standard definitions

clients will have infinite ways to describe expenses
expense types need to be normalized for tax calculations
this is important -- deductibility enhancement depend on map

Cost reduction through strong governance

Real-time monitoring

works side-by-side with clients expense system

Compliance Breach

Compliance risk

pages can be printed
tabular reports can be exported to excel

fully automated

compare against historical airfare and lodging database

Preferred vendor more expensive option was chosen lowest fair not selected

Detailed reporting

Cost reduction through monitoring

detail drill down comparisons & trends highlight anomalies discover unknown

can change analytical view

do lookup of historical hotel database

Collection at Scale

Hotel bills during annual company conference

did a group of employees stay at an expensive hotel? is this because they booked at the last second?

Algorithmic Detection   *deviations from moving average*

same reporting period? what if billing clients for expenses?

Cost

abnormal costs

are these "bad actors?" went for most expensive hotel? or was everything booked?

Normal Behavior   *within policy*

Abnormal Behavior   *outside policy?*

Rules-based Testing

Admin Reporting

24/7, 365 days a year

can drill down: analytical views filter expenses filter to specific employee

Machine Learner

Example Models

| Triple Exponential Smoothing |
| Robust Principal Components Analysis |
| Azure ML Anomaly Detection |

netflix open source surus project

Automated Anomaly Detection

normal hotel costs some variance but not extreme

Employee ID

Detection & Grouping

Alerting & Reporting

Delay Tolerance
Parametrics

seasonality day of week time of year

Advanced booking
flights/lodging have inflated prices

Weekend expenses
start on Saturday or end on Sunday

Duplicate expenses
receipts reused/reused by others

Late submissions
submitted long after incurred

Unauthorized expenses
activities not authorized by business

Mode of Transportation
car used instead of flying on longer trips

Hired car expense
within a reasonable range for car usage

Class of travel
more expense car/flight/room/etc.

Other
customized to each client

Business insights

Total spend
Categories
Type of spend
Cost centers
Compliance
Integrity checks
Outliers

can filter by expense type

expense value versus frequency

low volume to value
high volume to value

main employee population

all anomalies go to finance for sign off

anomaly is not out of policy
anomaly is out of policy

Adaptive Learning

is this acceptable? client sets thresholds

activate employee alert process

separated from admin interface employee only has access to his/her reports aggregate spend, classes of spend, trends, etc.

Cost reduction through employee awareness

Natural Language

Employee Emailed

Employee Alerts

Employee Reports

initially, no questions asked, make correction

revise expense report

finance can read and make model changes

add justification to expense

keeping a log of how many times this happens   ignore

convert anomalies into sentences easier for employee to read/digest can also include overall stats on expenses

General Ledger

Savings from:
employees knowing they are being watched
analyzing all expenses, not just a sample set
improving governance and policies
analyzing expense trends for ways to reduce costs
evaluate every expense for maximum tax savings

Employees reimbursed for expenses

Halo   ABC Company   Expenses

Halo   ABC Company 01/04/2014 - 30/04/2015   Expenses

Dashboard
£410,151   *Total YTD expenditure*
14   *Items > £500*
£33   *Average Item value*
672   *Number of items*
£34
£1 / £1,050

can change the chart view

Sunburst   Bar   Mekko   Map   Data sheet