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Design Portfolio Project Review

August, 2016

Pega Expense Manager

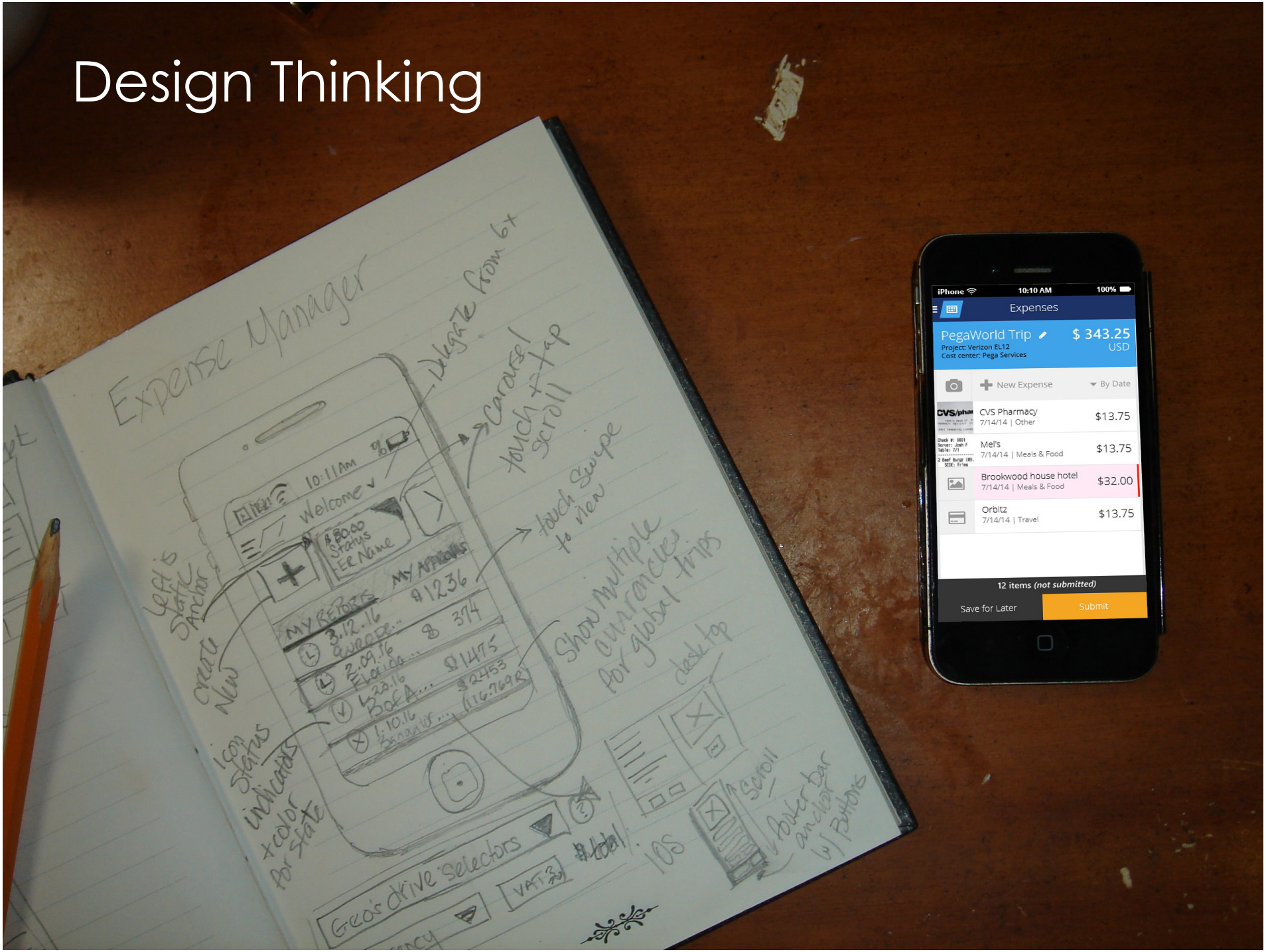
2015 was a year of significant change for Pega's Digital BPM Platform as Pega7 was released modernizing and changing the way Pega enterprise apps were to be built using their proprietary framework.

January of 2015, IT was tasked with changing the way employees entered, tracked and managed their expense reports using Pega7. What's more, IT had to also influence and change how expenses were approved and processed inside Operations and Finance – disturbing their current checks and balances processes, and yet, support all global currencies, as well as their number and language formats and control patterns.

I acted in a dual hybrid capacity as a the lead and co-UI/UX designer as well as a FTE UI developer within the Agile Scrum process.

To comply with my non-disclosure agreement, I have omitted and obfuscated confidential material in this case review. The commentary and details provided are of my own thoughts and do not necessarily reflect the views of Pega.

Design Thinking

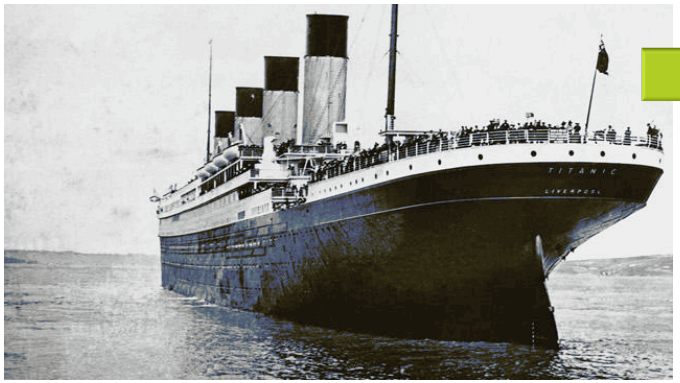


My Role

I led the design and implementation of Expense Manager throughout the entire software lifecycle for both the mobile and desktop platforms since the outset of the project which started Jan 2015.

Up until March 2016, I also drove the iterative UI/UX acceptance testing, the UI dev hardening tasks and user story refinement as well as addressing the end-user pain-points and –user experience improvement development

The Analogy: The Titanic (old expense app) vs. the Yacht & Jetski (new expense app)



- Java / JSP / HTML 1 / CSS 1
- PRPC v5.x -> v6.x
- =< IE9 only
- Too many integration points
- Paper-centric, no reporting
- Lots of calls to the support center
- Costly for Pega to support / use
- Not extensible
- Took 4+ years to implement and still problematic in 2015

- HTML5 / CSS3 / JS / JSP
- PRPC Pega 7
- Cross-browser compatible
- Accessible
- JQuery 10, RWD
- PDFs, Image integration
- Owl, Carousel JS Plug-ins
- Mobile Ready + Desktop
- Multiple personas, roles, global currency and number formatting, data integration and security points
- Took 1+ year to design, implement and release

The Holistic Mission

- The Titanic is sinking and we need to retrofit a new boat and a matching Jetski for portability **while it's moving***
  - Use the same data but also incorporate new, bigger and better integration points (dependencies)
  - Create a new app using a new version of PRPC software that no one has been trained on, developed with and hasn't even reached GA
    - Find Pega7 bugs and report on them before our customers do and it goes to GA
    - Work with product marketing (PM) and engineering to deliver the mobile features that aren't done yet and which are needed in order to build and deliver the mobile app
  - The new app must include all the features that existed in the old app and of course we want to add a ton of new features that our users haven't asked for
    - Perform gap analysis, dependency evaluation, user story development, acceptance criteria specifications and feature definitions
  - App must be feature ready in 12 months with a dev team of 4 Dev FTEs, 1 UI/UX FTE (myself) and 1 QA FTE
  - Stay within the guardrails and employ best practices
  - Use same theme as other Pega7 corporate standard desktop and mobile apps in the IT suite

* ***While it's moving*** refers to the point that management micromanaged the project the entire time and caused severe disruption to the team's efforts as well as inside the agile process causing priorities, features and processes to change weekly, if not daily. This resulted in an overall skewed project and delivery timeline as well as for QA to bottleneck and stall the release.

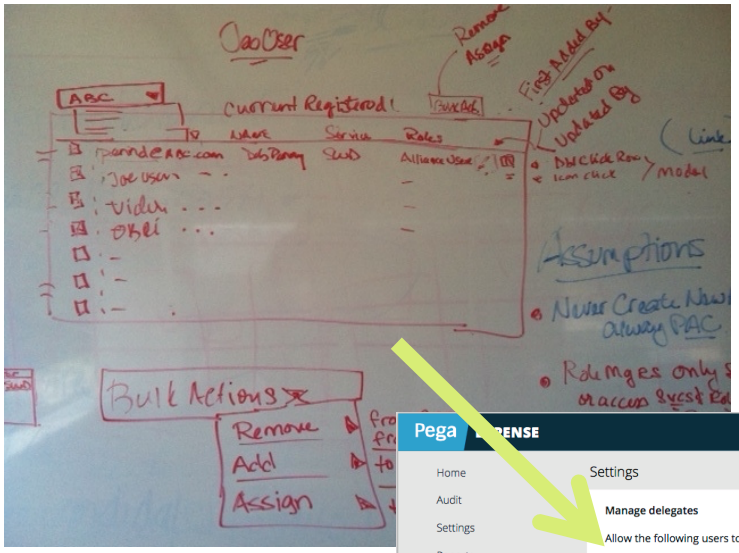
Holistic Challenges

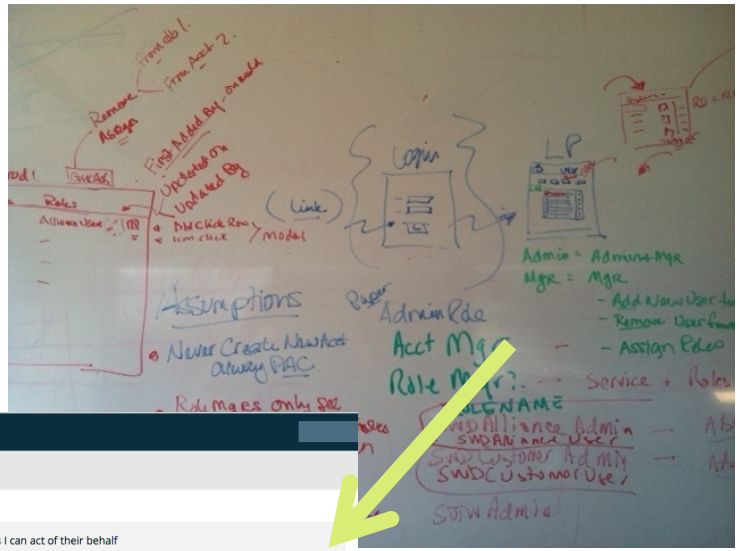
- Must allow the admin and finance teams the ability to easily account for all **approval** and **audit trails**
- Must adhere to business and process rules such as daily max amounts for **itemizations**, categorical **limitations** based on multiple **personas** and be intelligent enough to detect errors and provide **validation** against all **world-wide currencies** and **global** geo **locations**
- Provide special UI to handle VAT and other taxable items for reconciliation in the UI and on reports
- Be **mobile**-ready, **responsive** and have the ability to **use offline**
- **Same**/Similar user **experience** for **desktop** and **mobile**
- **Holistically**, the biggest challenge I faced throughout this project was moving forward with the **right Pega7 design patterns for the right features**, while collaborating with the wider team and stakeholders. This project touched many parts within the company at different locations and spoken languages as well as functional disciplines. I had to get buy-in from many different use-cases and viewpoints and this was difficult.

Holistically how we got there

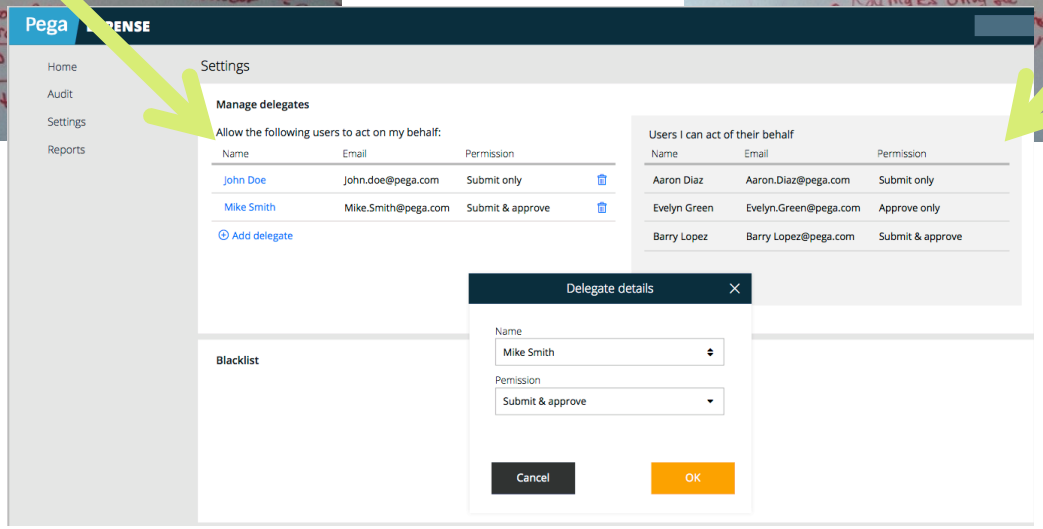
- White-boarding of the process and early definition of personas for:
  - Approvers
  - End-users
  - Auditors
  - Managers (approver of approvers)
  - Delegates
- Wire-framing and process flow analysis for itemization
- Photoshop and Illustrator used to design heuristic mockups
- Setup proposed data structures for the data/backend developers early on
- Research on global currency formatting, use cases and tax laws
- Hi-fi interactive mockups using Marvel App for itemization and delegation to help define feature inner-workings
- Continual end-user interviews and sprint reviews
- Early competitor product feature research (Concur) – why reinvent the wheel
- Introduced common skin for standard desktop and mobile app along with app-specific custom CSS and shared assets
- Ensure macro- and micro-level consistency across desktop and mobile with style guides and UI Kits

White-boarding to define personas

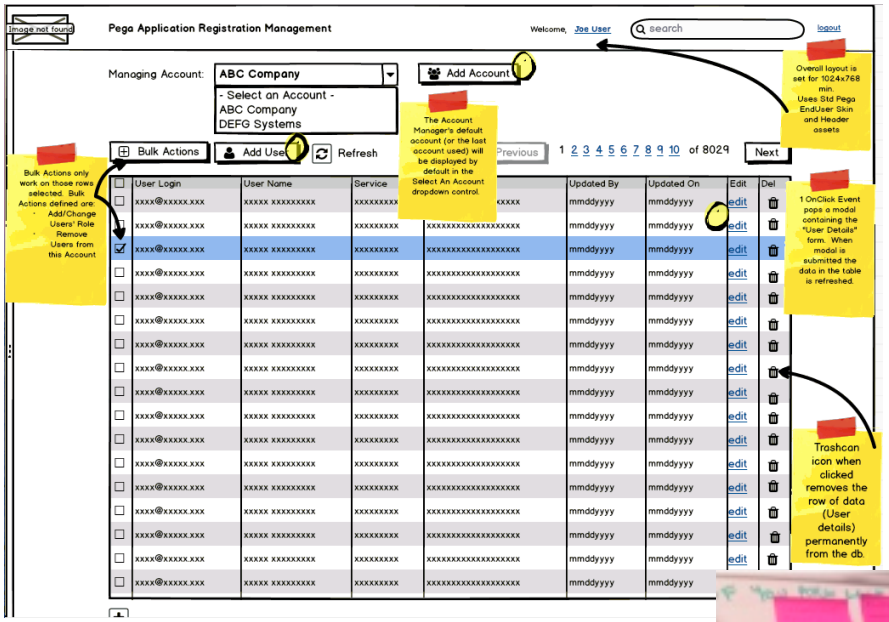




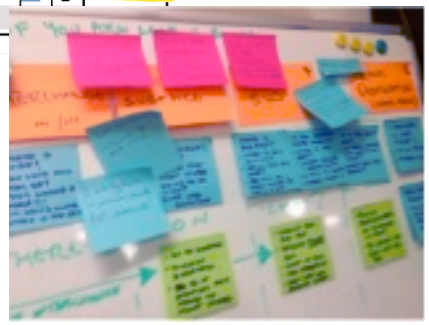
IA whiteboard sessions turned into ideation, mockups and then final product



Wire-framing, stickies and flow

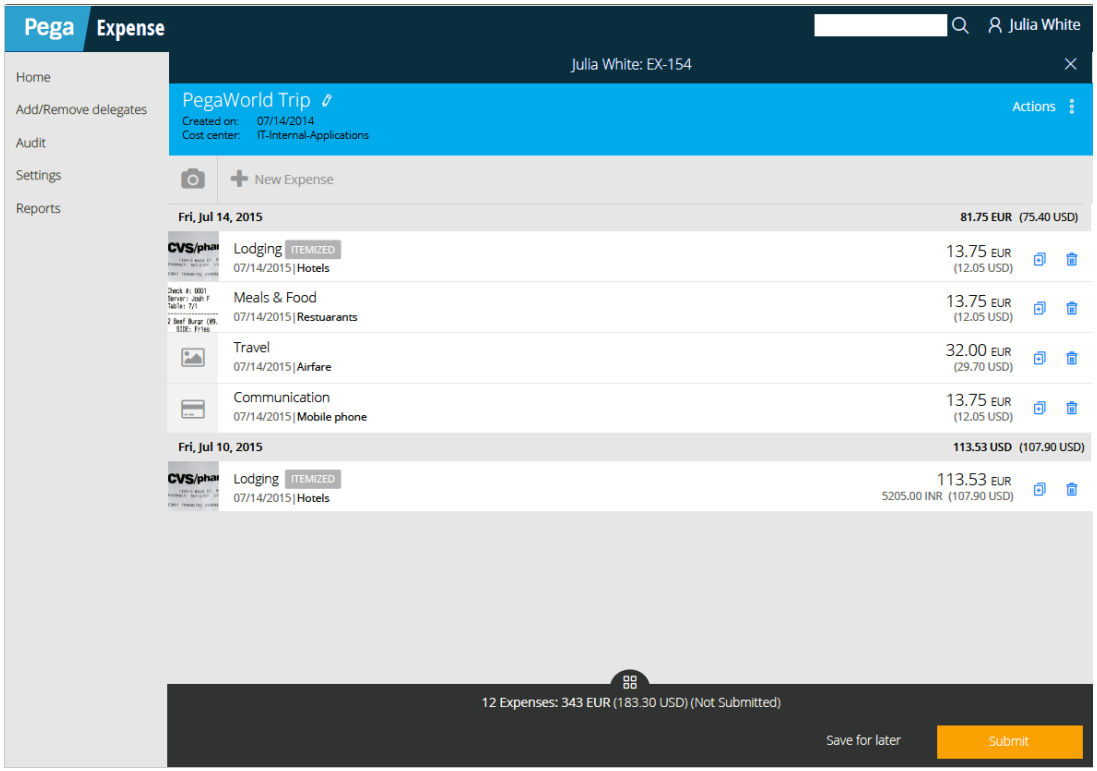


To identify personas, I used UX tools like Balsamiq, post-it notes process flow analysis and A/B testing to prove solid UI use cases and patterns to better define user stories around approvals and auditors



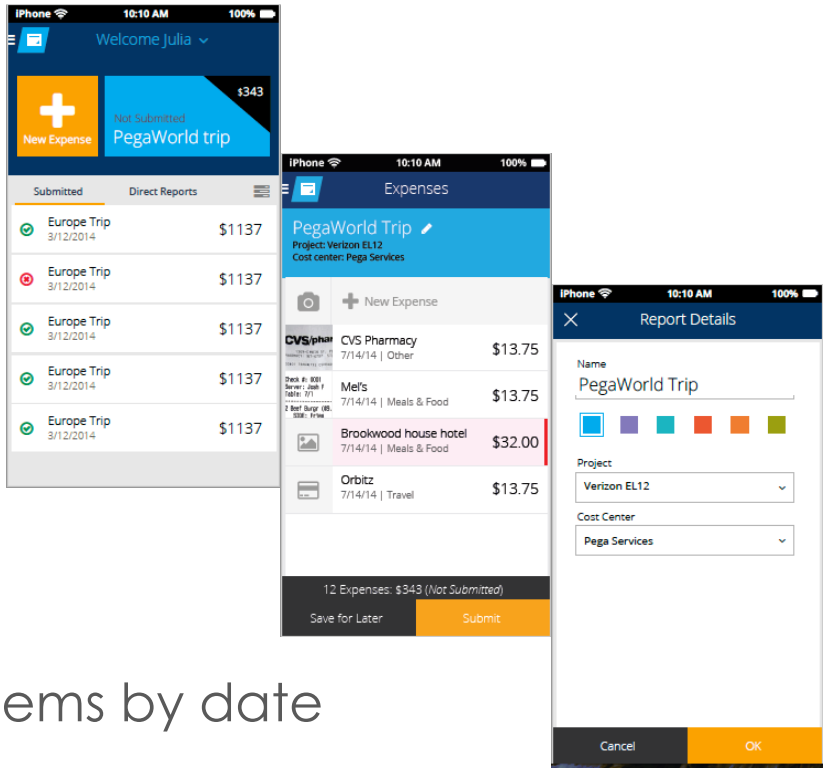
Holistic App Design Patterns

- Navigation and module tabs
- Dialog boxes
- Modals
- Notifications + hover text and audit trails
- Menus – hamburger, horizontal, vertical and accordion
- Grids with zebra banding, row filters, sorting, row select, row edit in place, row reordering
- Shopping cart like bucket control for receipts against itemizations



Page Content Design Patterns

- Dashboard starting point
- Carousel
- Copy Box
- Thumbnails
- Zoom (receipts inline)
- Receipt Image Gallery
- Pricing Table but for report items by date



Mobile Content Design Patterns

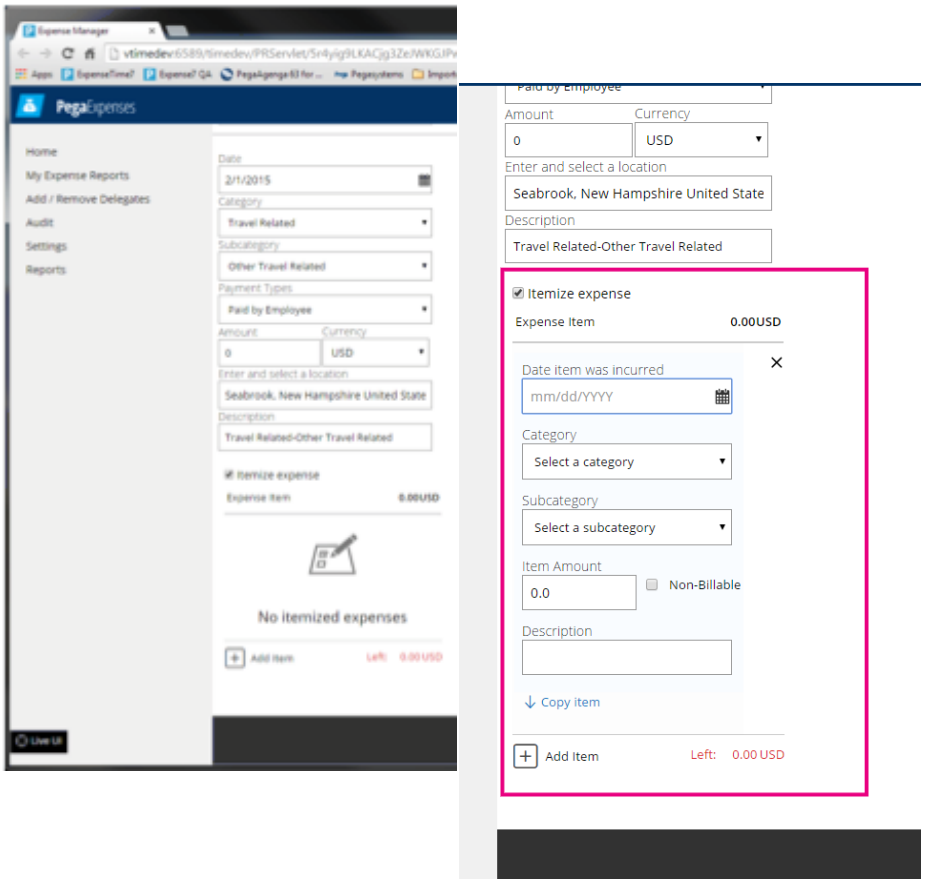
- Compose screens
  - Native keyboard display for control type
  - Field types for number, email, URL, text, etc.
- Pop-overs for info and auditors
- Lists to show numbers of items
- Splash screens for login
- Maps for localization
- Galleries for receipts
- Mobile screens in single, responsive columns
- Header navigation for fat fingers
- Timelines to show spending
- Detail views by date / cost
- Empty data sets as inline help

Cognitive Design Patterns

- Progressive disclosure on views
- Chunking
- Completion
- Limited Choice
- Framing (choices negative vs. positive)
- Serial position effect (most important at the top)
- Sequencing
- Triggers
- Status

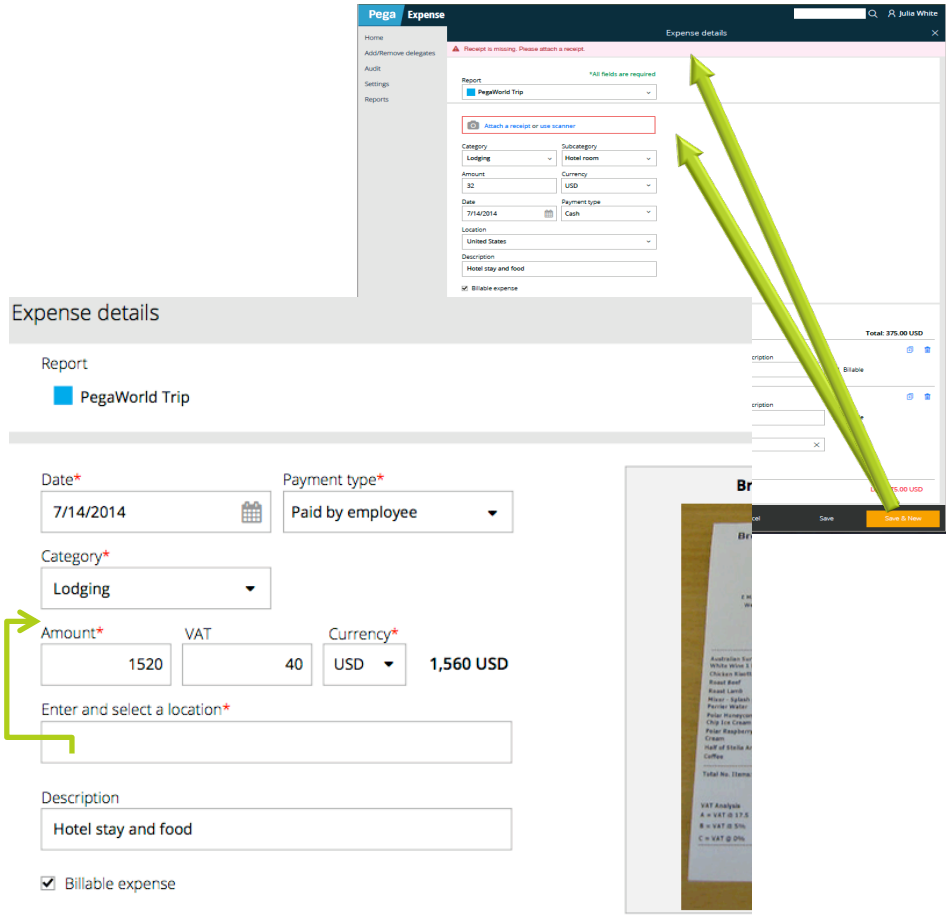
The micro challenge: how do we handle validation, localization, foreign currency and tax entry in a single dynamic display

- Entering item data during itemization proved to be a very hard thing to do
- I had to account for global locations, currency types and currency formats all on the same itemization screen
- Incorporate validation based on different global currency, category and location rules
- Incorporate tax handling for non-US items incurred such as VAT for reporting and recovery
- When the user selected a category, subcategory and currency type, all the underlying fields should change based on the values selected, i.e., when meals in EUR are entered, the VAT input field must be displayed
- It must all be responsive and work the same on desktop as well as mobile



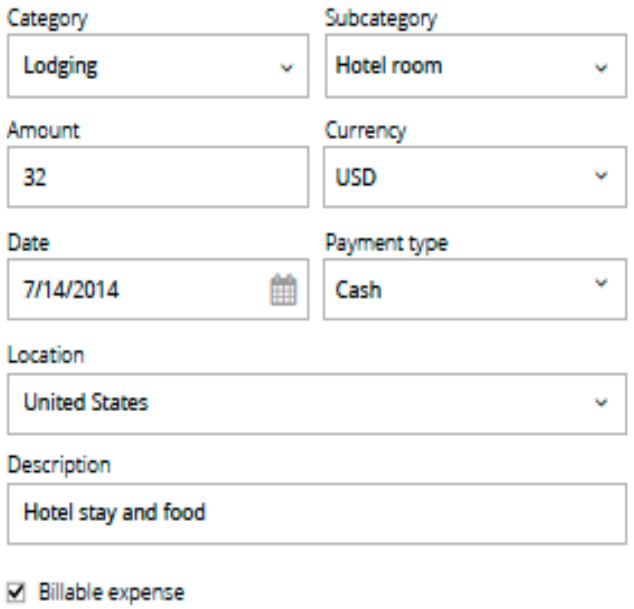
How did we solve it

- Used sequencing and serial entry design patterns to streamline the item and itemization data entry
  - In this case, order mattered. Based on the category type, currency type and location, on entry and field exit, we were able to refresh the input area to display the appropriate required fields needed
- Originally, validation occurred every time the user exited the field. We changed validation to occur during the global save event also allowing users to enter as many items as needed and speed up form entry
- Move location field above currency for onExit refresh to display the correct VAT and country formatting inline



Input Design Patterns and Controls

- Date Picker (single date, ranges)
- Input field validation, entry, helper text, labels
- Inline help box
- Drag and drop
- Structured format controls like auto-complete, drop-down, select, checkbox, radio buttons, data fields [airports, currencies, states, countries, categories]
- Google geo location API integration
- Completeness number counter for number of items in itemization against total of report



What we learned

- What worked well was the UI layout of the item entry screens as well as the dashboard layout
  - People found it easy to use, could find their reports in-flight, those resolved and the ability to enter items in the report
  - Finance could report on expenses and now was finding flaws in the business rules
- Mobile support available for Chrome + Safari browser only
  - Could use app offline in the field to partially create and hold receipts in reports as expenses were incurred
  - Mobile engineering team in Poland said it would take 6 weeks of development to provide enhancements to support native IOS and Android support for Pega 7
- Delivered new app in 15 months
  - Design re-iterated / changed 48 times over the course of the project
- Code bloat due to PM advising us to use one app for both Mobile and Desktop caused severe performance issues
- The backend data structure couldn't support large transactions due to the size of receipt images.
  - Receipt images went missing after the report was submitted. The data guys tried to say it was the UI but it was evident at code review that the java code to upload and store the receipts was not scalable and could not handle db transactions to the BLOB the further away the app server was from the db server

Thank you

- As designers, no matter what we put on the page, design thinking is critical to successful outcomes and can be applied to any medium and demeanor
- The user interface leads the user down the right or wrong path
- The core app architecture drives performance and capability
- Stakeholders are the most important asset to any successful project and tell us how it really is
- Experience tells us the story – there is no right or wrong way – you own it
- Retrospection is free, it affords us forgiveness and the grace to improve upon the next iteration – after all, we are only human
- Thank you for the opportunity to share my story