Building Highly Usable Yet Performant Applications

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Clarice Technologies

IndicThreads

27-28 FEB 2015

PUNE, INDIA

Traditional Web | Web 2.0 | Modern Web

Backend Heavy

Rich Internet Apps

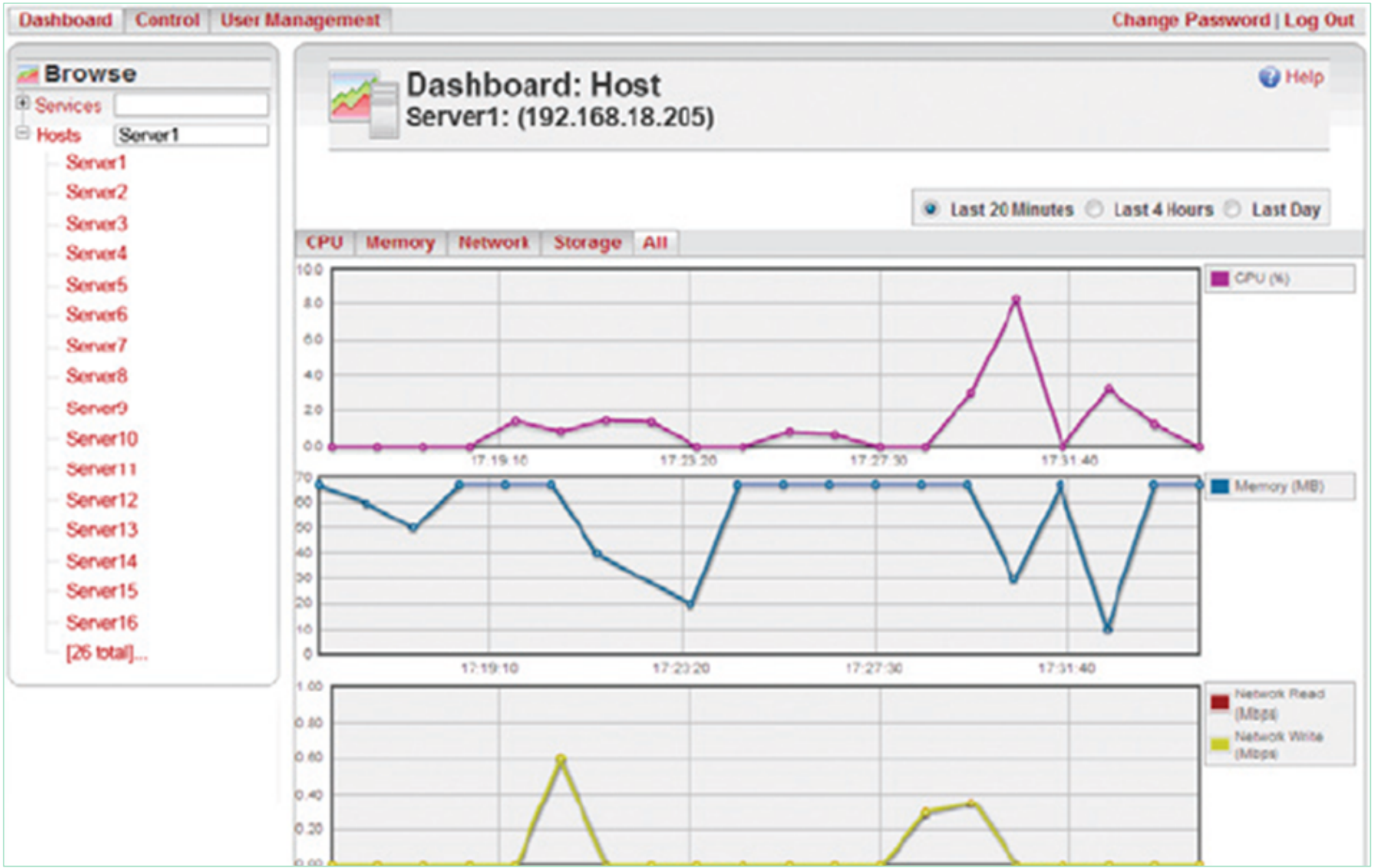
Thick-client RIAs

27-28 FEB 2015

PUNE, INDIA

MYTH

Beauty is Skin Deep



Implementation strategy

- Built incrementally
- Engineer driven / Data Model Driven
- Separate requests for each server to fetch details
- Stats and details are computed for every request
- UI very hard to scale for more servers (100s - 1000s)
- Overall aesthetics are poor

Server architecture

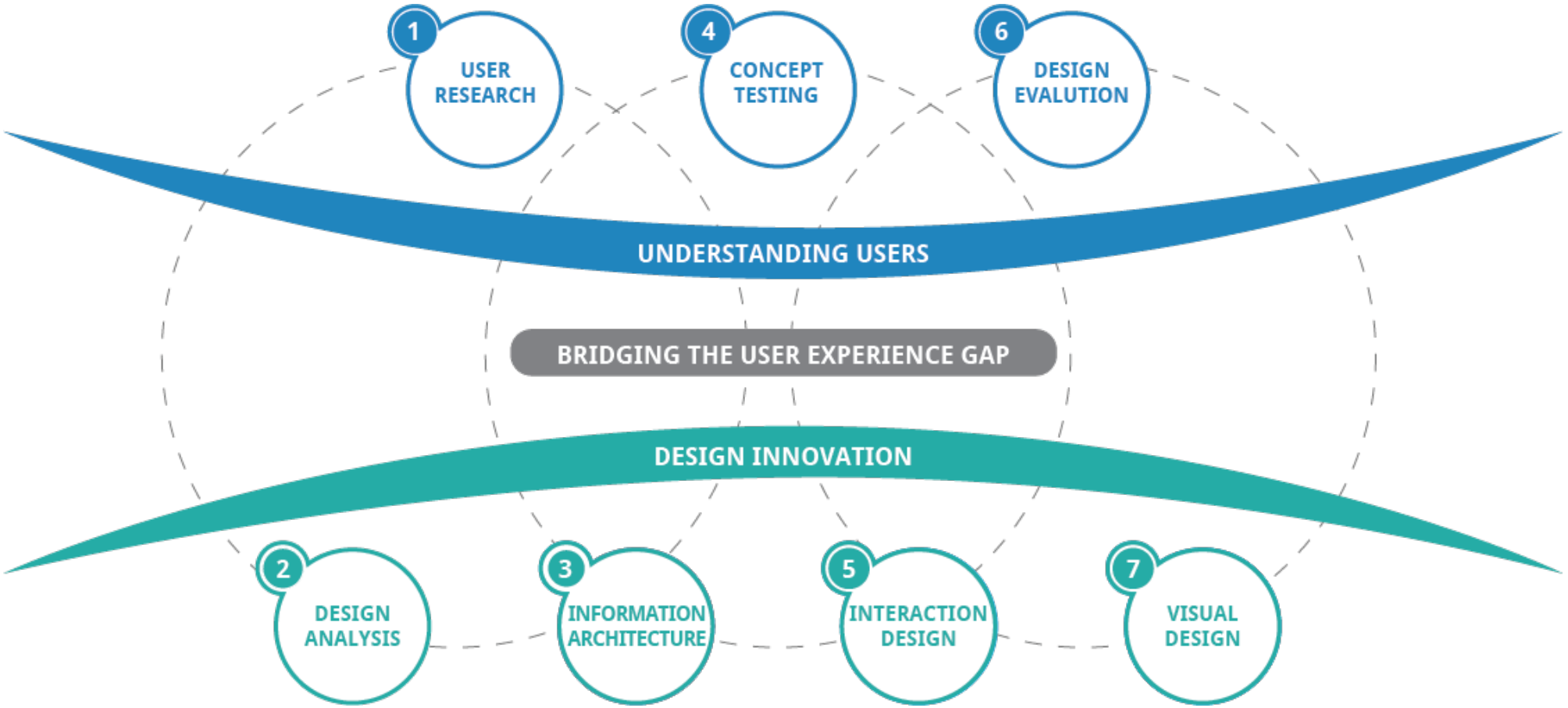
- Web server to serve the response
- Database to store and retrieve data
- Status and other details fetched for every request

Performance Considerations

- Very light on browser, Lot of user clicks
- Large number of requests on Web Server
- Large quantum of network traffic
- Scale out needed on Web Server (sessions ??)
- Very small data requests from Databases

ENTER THE DESIGN ARCHITECT

User Experience Design Process



User Experience Design Activities

Stage	Activity	Deliverable	Success Factors
Study Product Eco-system	***What & how of the domain, study product requirements, understand business case***	***Mind maps***	***Understanding of product philosophy, problem it intends to solve and key USP***
Use Case Analysis	***Study of user profiles, Use-case analysis, Product usage scenarios, workflow analysis***	***Personas, Scenarios & high-level use cases***	***Identification of precise user goals & objectives (signal vs. noise)***
Information Architecture	***Navigation model & building blocks, High-level Interaction & conceptual design***	***Block Diagrams/ structural design***	***Conceptual design – mapping navigation model & building blocks to user goals***
Interaction Design	***UI design of key views, workflows, components - covers about 50% features & functions***	***Wireframes***	Consistent, Intuitive, Efficient & Aesthetic design of UI screens
Visual Experience Design	***Design product Identity – Typography, Color, Icons, graphics & grids***	***UI Mockups***	***Creating a differentiated & engaging visual experience***
Resource Creation & Documentation	***Resource required during development***	***9 patches, retina & non-retina resolution PNG files***	***Smooth integration withbackend***
Usability Testing (Optional)	***End-user testing in lab – on UI mockups or alpha/beta quality product***	***Usability Report***	***Discovering design flaws by user observation***

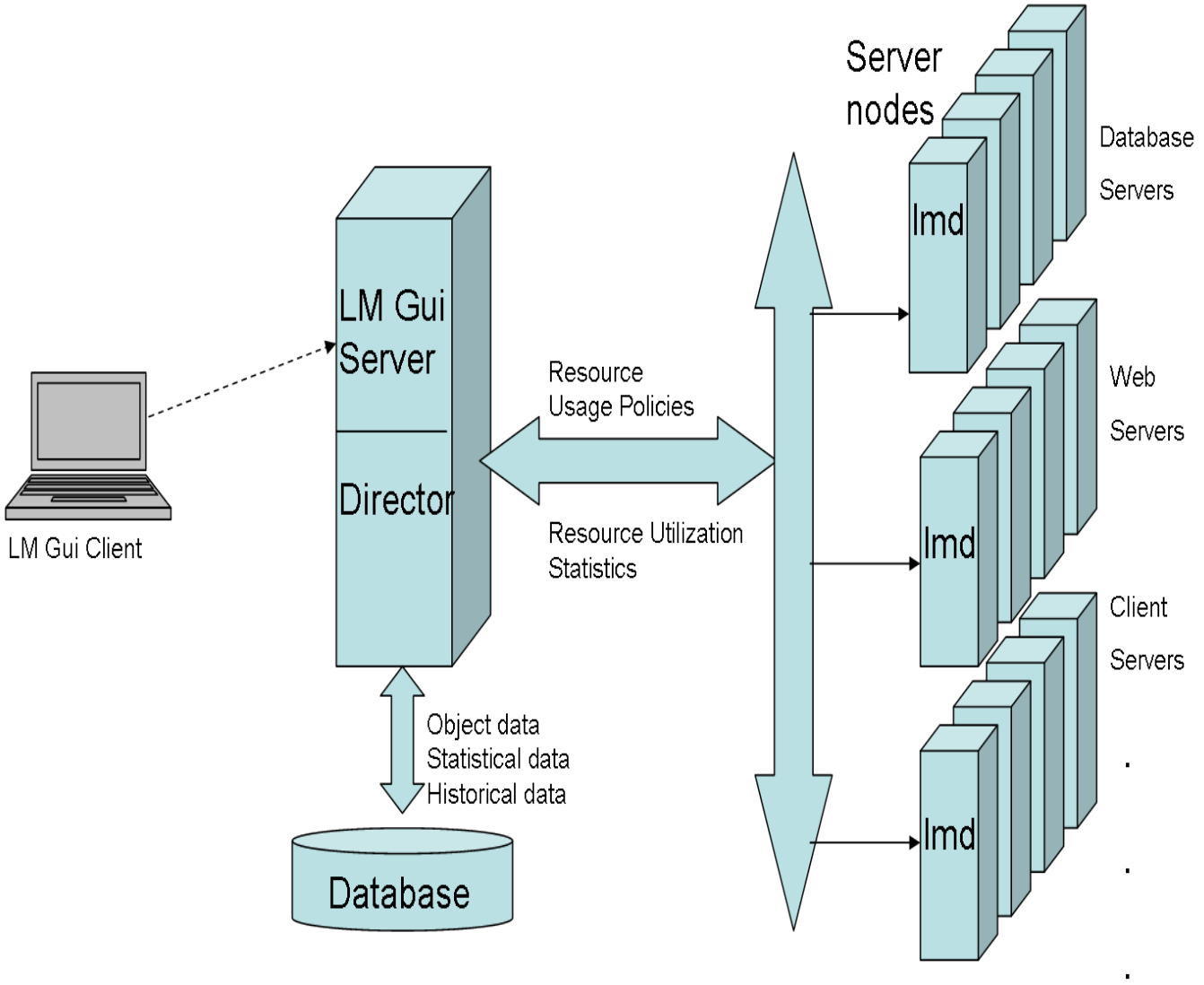
Understand Product Eco-system

Key Players:
Product Champion/Manager, UX Architect, Technical Architect

Activities:
What & how of the domain, study product requirements, understand business case

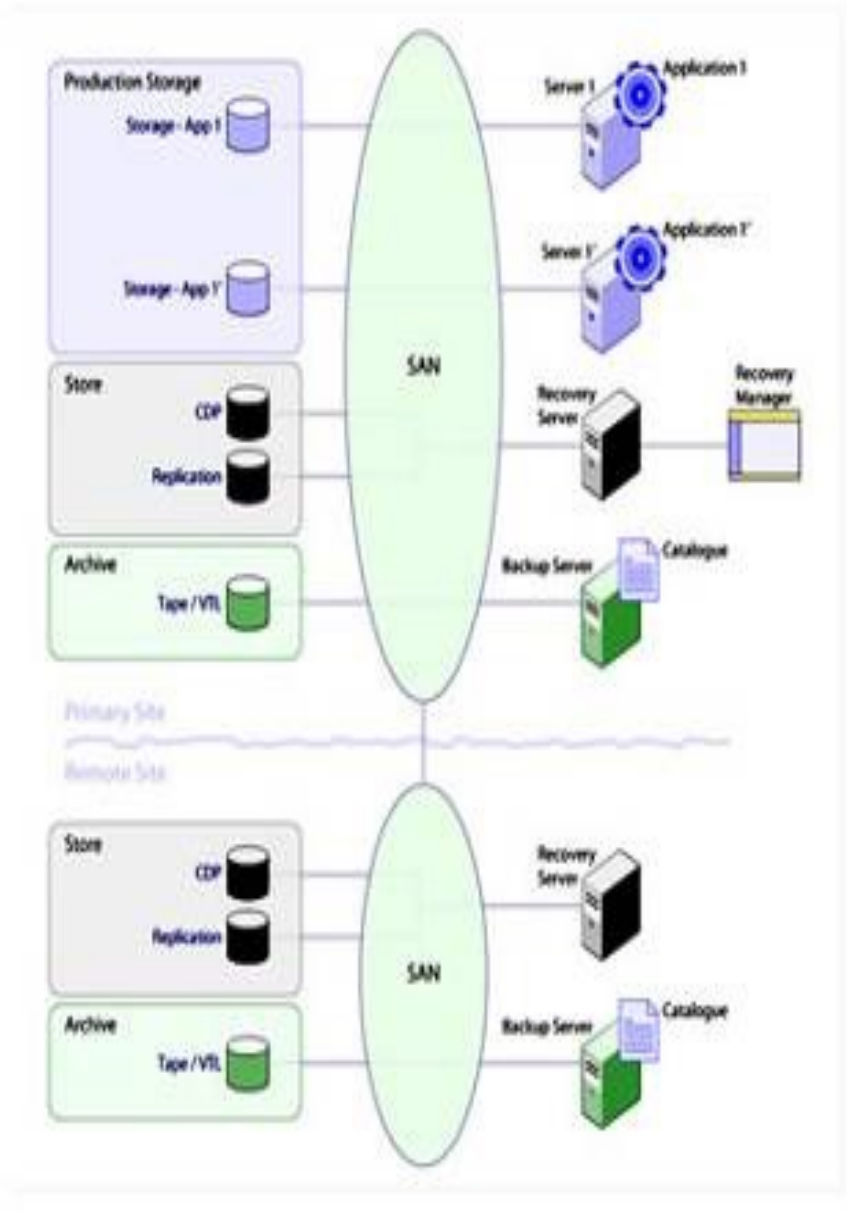
Interaction/Communication:
F2F meetings with product/ technical manager, Audio/Video conference calls, webex, emails

Deliverable:
Presentation that captures product understanding & approach to design



Success Factors:
Understanding of product philosophy, problem it intends to solve and key USP

Understand Product Eco-system



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Typical Duration: <1 week

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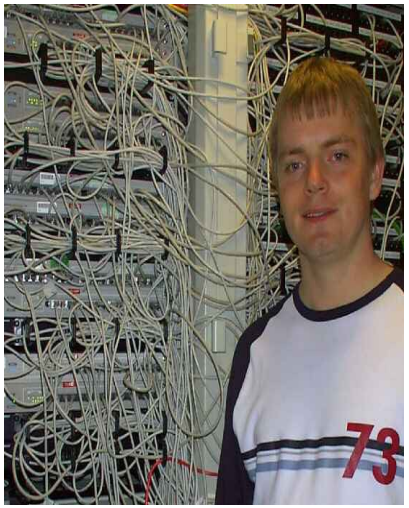
CIO

I want a weather report every morning

Datacenter Manager

Show me a high-level overview of health of my IT infrastructure



Datacenter Admin

Monitor, Administrator & Configure datacenter assets

Success Factors:
Understanding of product philosophy, problem it intends to solve and key USP

Product Audience

Here are a few of the factors to consider about product audience, and the implications for a product design:

	Questions	Implication
Role	What decisions do they make? What questions do they need answered?	Structure the information to make it super easy to answer high priority questions.
Work flow	In what context will they be reviewing the dashboard? What information are they using on a daily basis? How much time do they have to review the numbers?	The form and information display needs to fit into an existing work flow. For example, an on-the-road sales person may need information delivered to her BlackBerry, not designed for an online wide-screen monitor.
Data comfort and skills	How sophisticated are they with using data? Are they proficient in Excel? Do they enjoy digging into the numbers?	The dashboard's level of detail and analytical capabilities should match the audiences' comfort zone.
Business and data expertise	How familiar are they with the key performance metrics? Do they understand where the data comes from? Are they familiar with internal company or industry terminology?	This determines the need for embedded explanations and use of natural language.

Scenario/Use Case Analysis

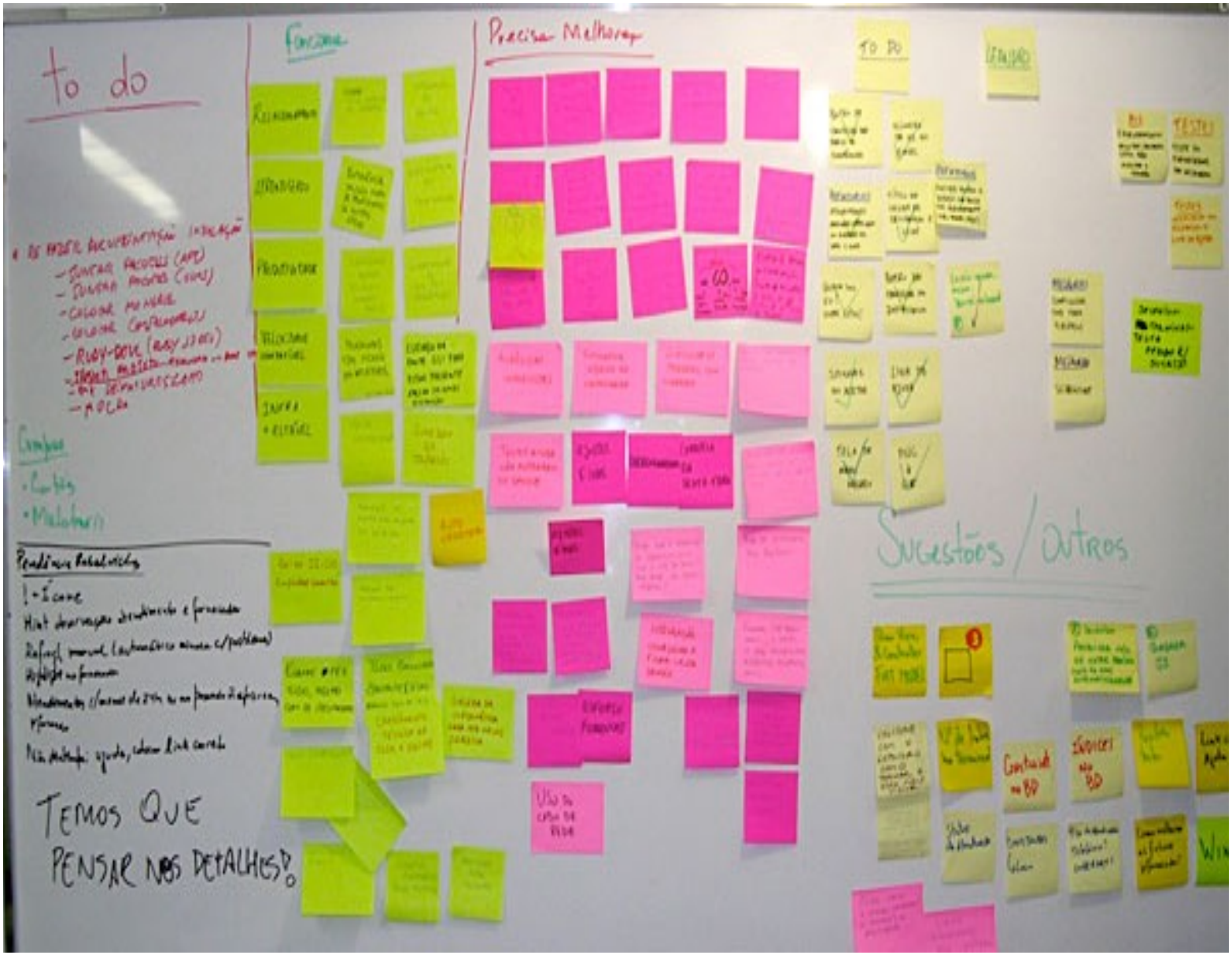
Key Players:
Users, Product Manager, User Researcher, UX Architect

Activities:
Study of user profiles, Use-case analysis, Product usage scenarios, workflow analysis

Interaction/Communication:
Face-to-face meetings, White-boarding, Audio/Video conference calls, webex, emails

Typical Duration: 1-2 weeks

Deliverable:
Design Analysis document that captures user profiles, use-case analysis & usage scenarios



Success Factors:
Identification of precise user goals & objectives (signal vs. noise)

Scenario/ Use Case Analysis

This is a list of options for your perfect view.

Check the boxes that best fit your situation.

Scope	☐ **Broad**: Displaying information about the entire organization		☐ **Specific**: Focusing on a specific function, process, product, etc.	
Business role	☐ **Strategic**: Provides a high-level, broad, and long-term view of performance		☐ **Operational**: Provides a focused, near-term, and tactical view of performance	
Time horizon	☐ **Historical**: Looking backwards to track trends	☐ **Snapshot**: Showing performance at a single point in time	☐ **Real-time**: Monitoring activity as it happens	☐ **Predictive**: Using past performance to predict future performance
Customization	☐ **One-size-fits-all**: Presented as a single view for all users		☐ **Customizable**: Functionality to let users create a view that reflects their needs	
Level of detail	☐ **High**: Presenting only the most critical top-level numbers		☐ **Drill-able**: Providing the ability to drill drill down to detailed numbers to gain more context	
Point of view	☐ **Prescriptive**: The dashboard explicitly tells the user what the data means and what to do about it		☐ **Exploratory**: User has latitude to interpret the results as they see fit	

Scenario/ Use Case Analysis

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Reveal information as the user expresses interest.
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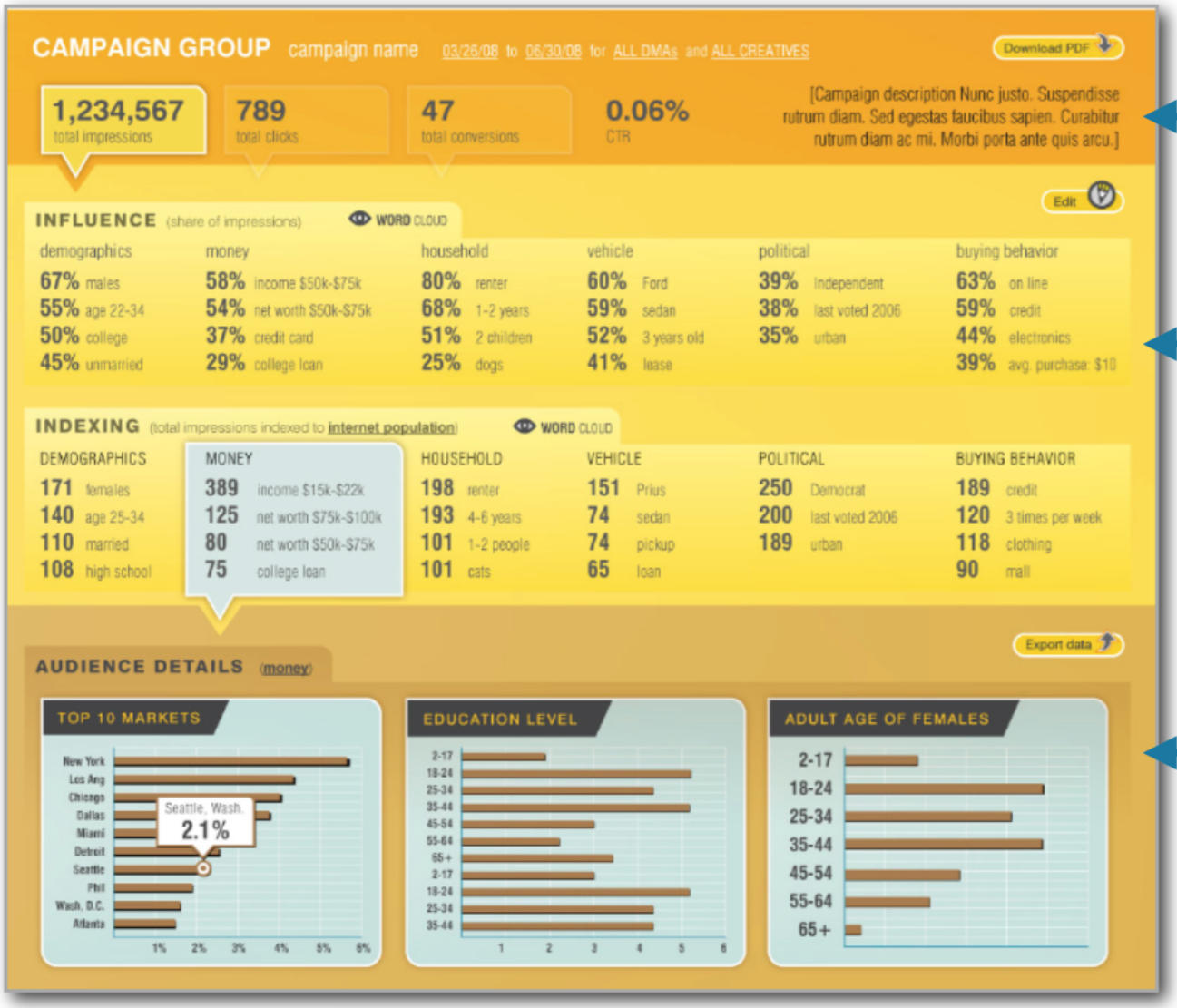
Don't bombard the user with all the information at once.



Key metrics

Context

Detail

Success Factors:
Discovering design flaws by user observation

Scenario/Use Case Analysis

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Admin

Add Users & Groups

Manage Server/s

Assign Roles & Privileges

Set global settings

Monitoring

View Server Status

Select high/low Utilized Servers

View Historical Data

Choose Service Levels

Configure Advanced Settings

Configure

Group Server/s

Configure Thresholds

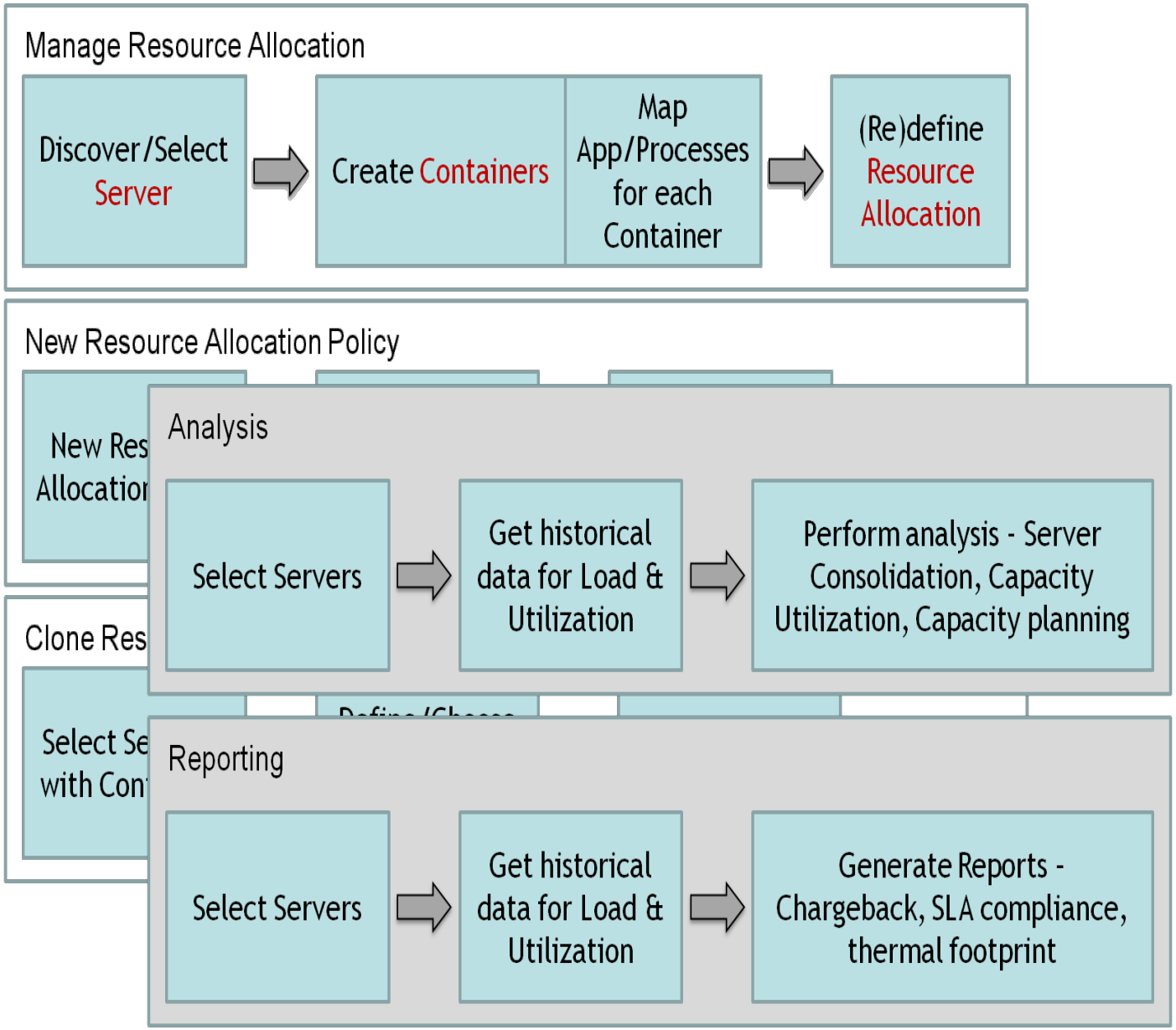
Apply high/low utilization policies

Configure Alerts

Design Reports

Success Factors:
Identification of precise user goals & objectives (signal vs. noise)

Scenario/Use Case Analysis



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Deliverable:
Design Analysis document that captures user profiles, use-case analysis & usage scenarios

Success Factors:
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Information Architecture

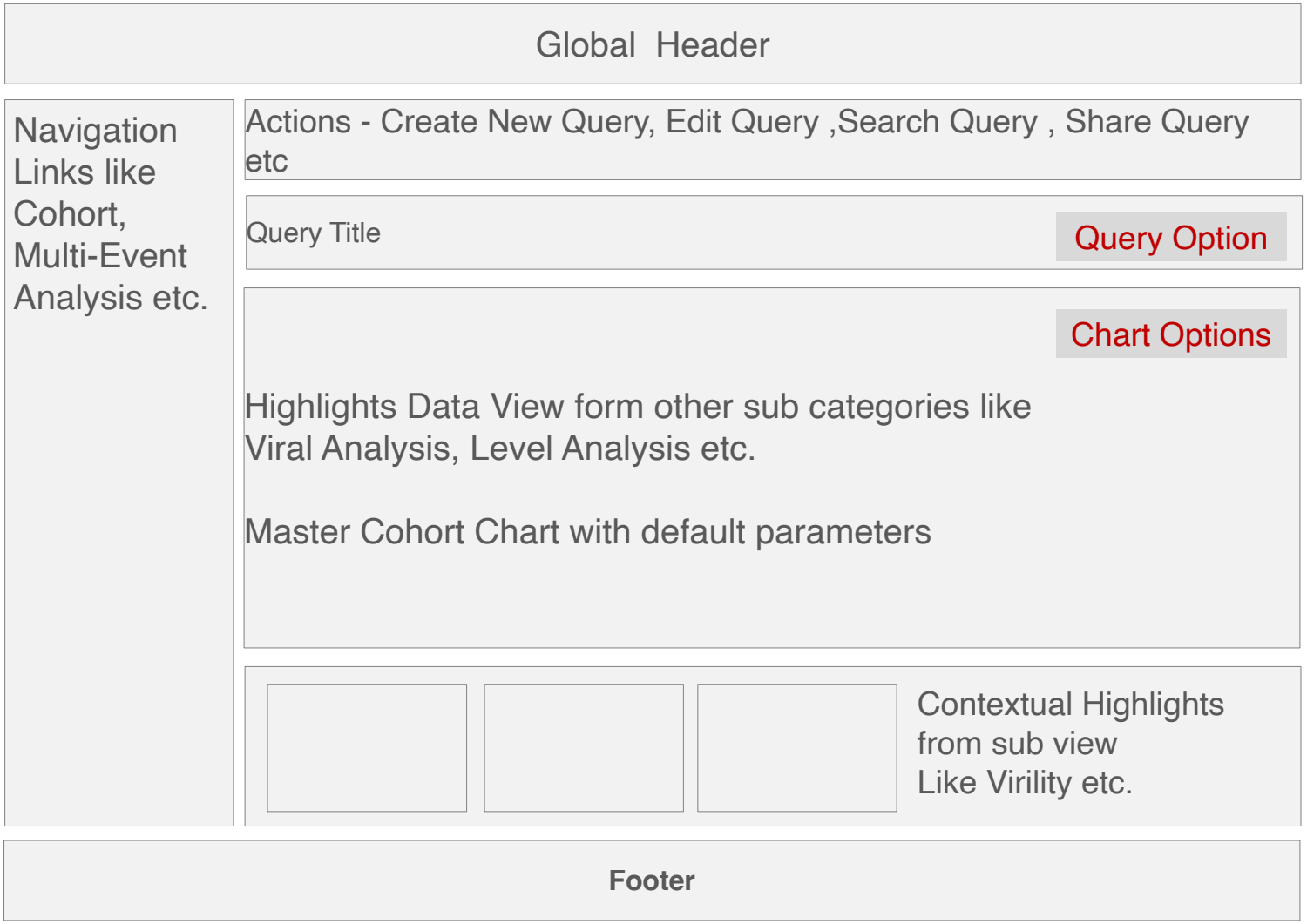
Key **Players:**
Product Manager, UX Architect, Technical Architect

Activities:
Information Architecture (navigation model & building blocks), High-level Interaction & conceptual design

Interaction/Communication:
Design brainstorming meetings, Audio/ Video conference calls, emails

Typical Duration: 1-2 weeks

Deliverable:
Block diagrams to discuss various options of organizing overall functionality



Success Factors:
Conceptual design – mapping navigation model & building blocks to user goals

Interaction Design & wireframing

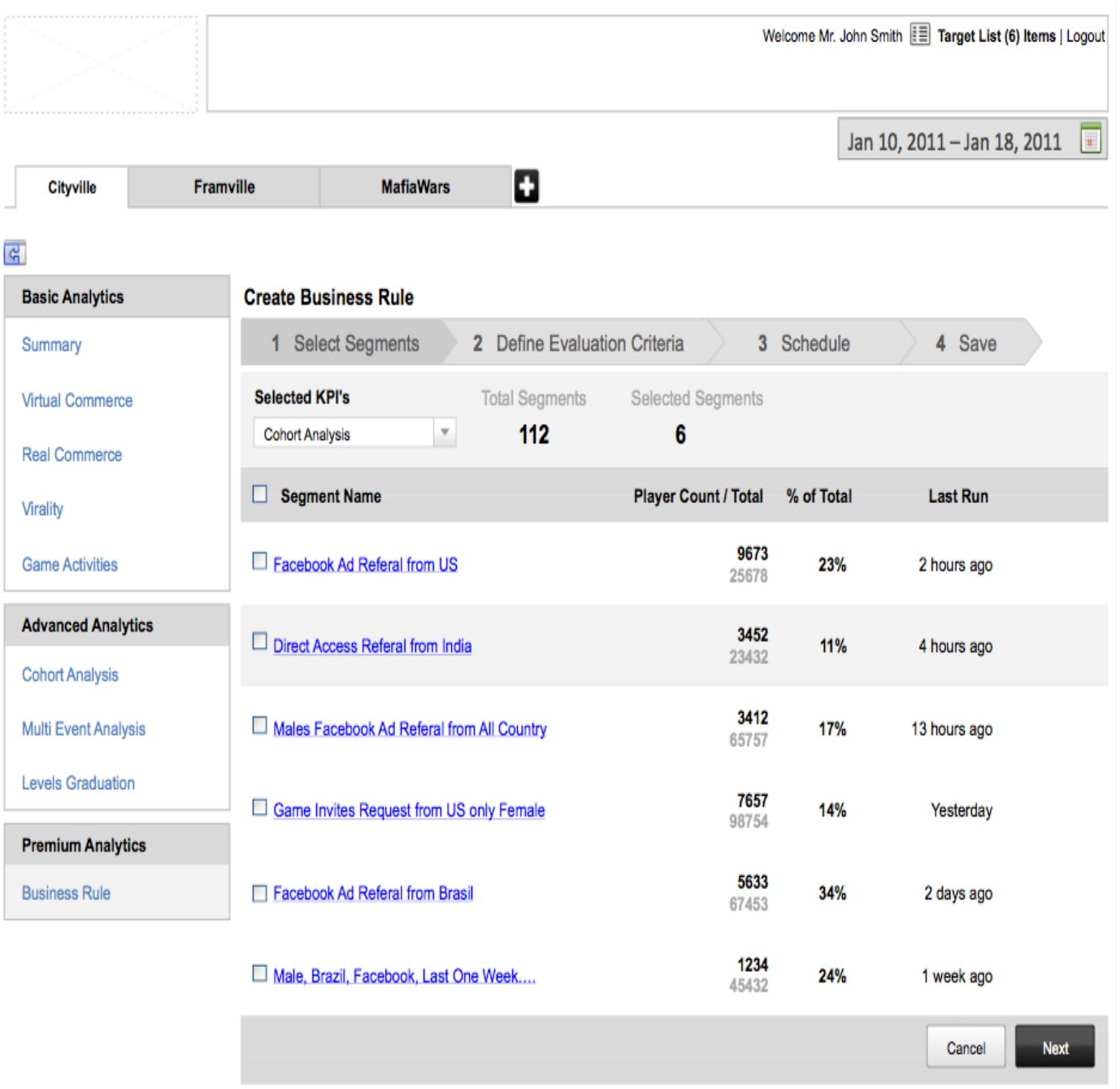
Key Players:
UX Architect, Technical Architect

Activities:
UI design of views, workflows, components and reports with documented behaviour of each interaction.

Interaction/Communication:
Design brainstorming meetings, Audio/ Video conference calls, emails

Typical Duration: 2-4 weeks

Deliverable:
UI wireframes that illustrate form & behaviour specification



UI Design Explorations

Key Players:
UX Architect, Technical Architect

Activities:
UI design of views, workflows, components and reports with documented behaviour of each interaction.

Interaction/Communication:
Design brainstorming meetings, Audio/ Video conference calls, emails

Typical Duration: 1-2 weeks

Deliverable:
UI wireframes that illustrate form & behaviour specification

Success Factors:
Consistent, Intuitive, Efficient & Aesthetic design of UI screens

UI Design Explorations

Problem:
Monitor datacenter servers with load values for each of them for various factors like:

- CPU
- Memory
- I/O
- Network Bandwidth

Challenge:

- Scalability: > 10,000 Servers
- Grouping: Meaningful tagging to aid sort filter

Key Players:
UX Architect, Technical Architect

Activities:
UI design of views, workflows, components and reports with documented behaviour of each interaction.

Interaction/Communication:
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Typical Duration: 1-2 weeks

Deliverable:
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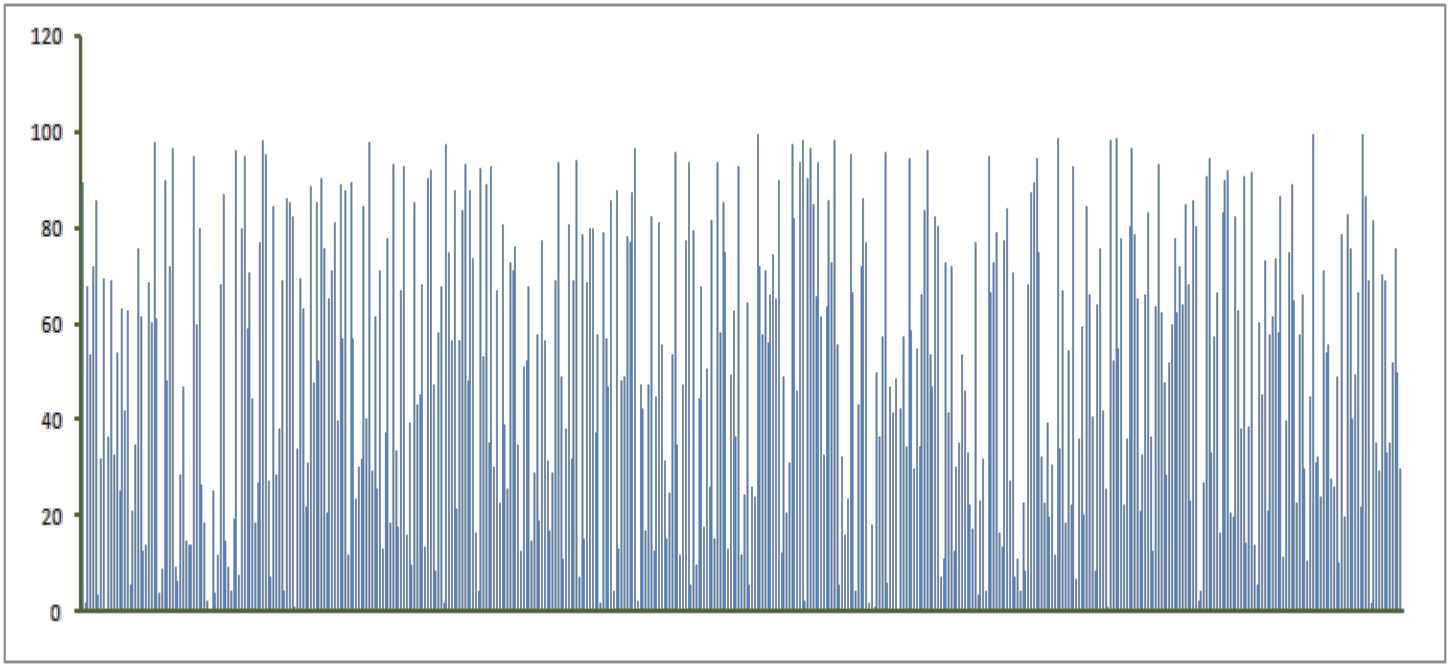
UI Design Explorations

Exploration 1:
Bar chart showing load on Y-axis



Key Players:
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Activities:
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Interaction/Communication:
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Typical Duration: 1-2 weeks

Deliverable:
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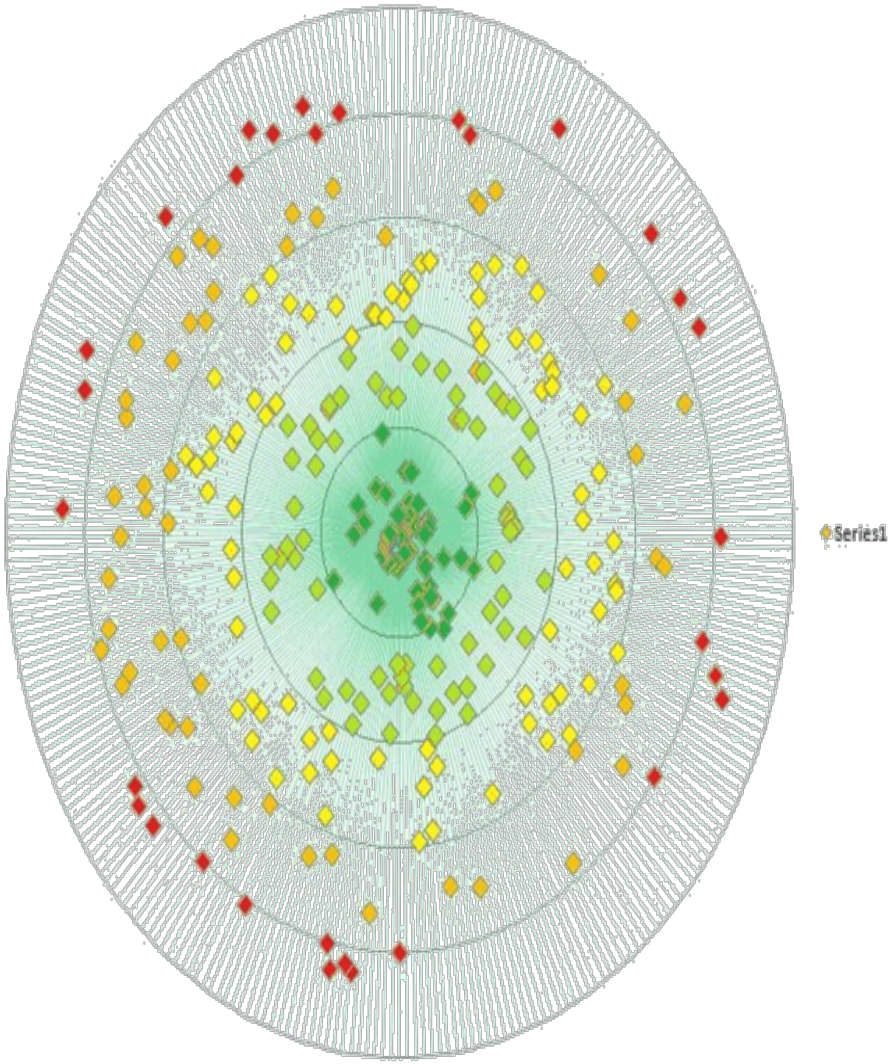
UI Design Explorations

Exploration 2:
Radial chart showing load on radial axis.



Key Players:
UX Architect, Technical Architect

Activities:
UI design of views, workflows, components and reports with documented behaviour of each interaction.

Interaction/Communication:
Design brainstorming meetings, Audio/ Video conference calls, emails

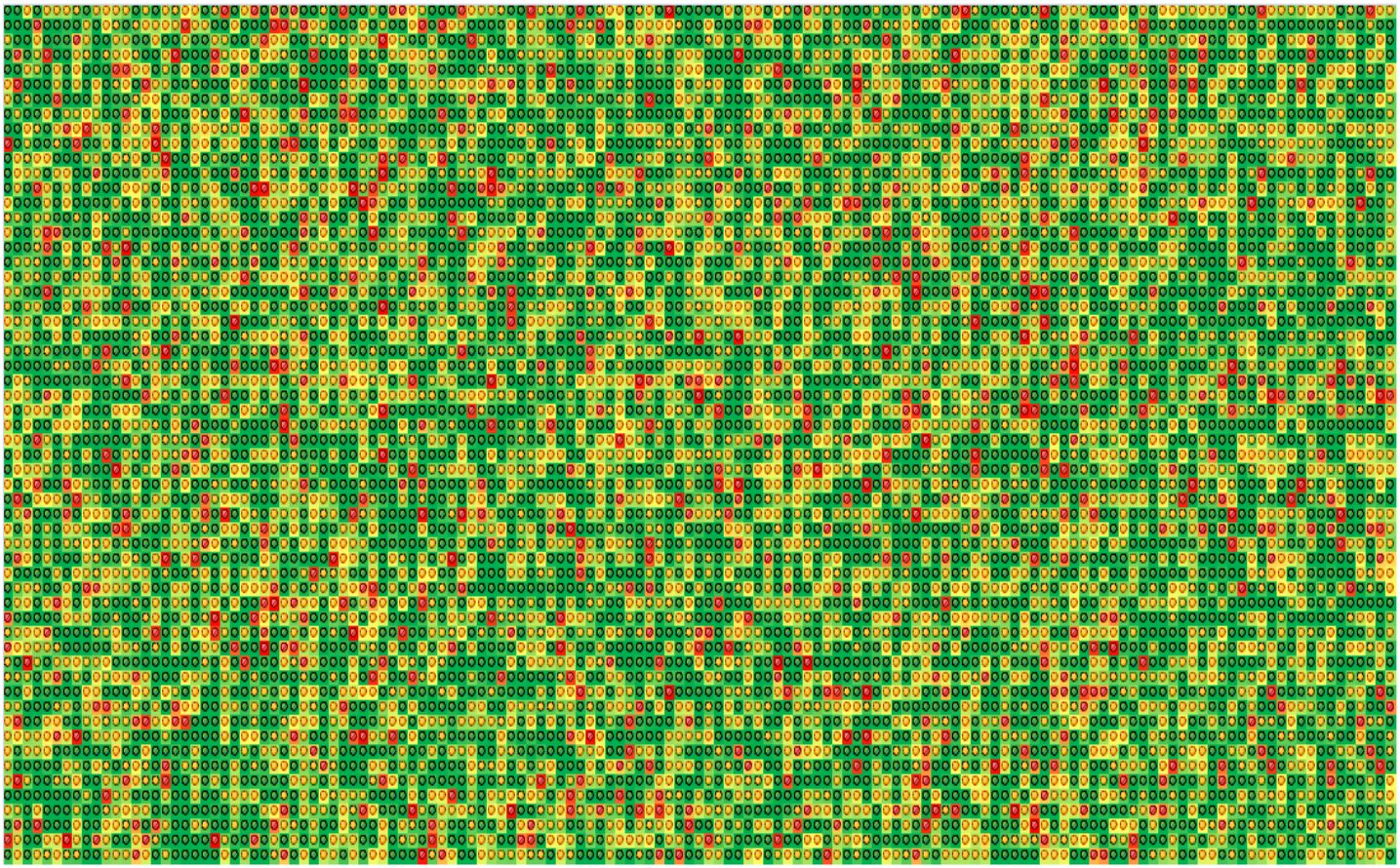
Typical Duration: 1-2 weeks

Deliverable:
UI wireframes that illustrate form & behaviour specification

Success Factors:
Consistent, Intuitive, Efficient & Aesthetic design of UI screens

UI Design Explorations

Exploration 3:
Heat map of randomly distributed servers



Key Players:
UX Architect, Technical Architect

Activities:
UI design of views, workflows, components and reports with documented behaviour of each interaction.

Interaction/Communication:
Design brainstorming meetings, Audio/ Video conference calls, emails

Typical Duration: 1-2 weeks

Deliverable:
UI wireframes that illustrate form & behaviour specification

Success Factors:
Consistent, Intuitive, Efficient & Aesthetic design of UI screens

UI Design Explorations

Exploration 4:
Two-axis Heat Maps

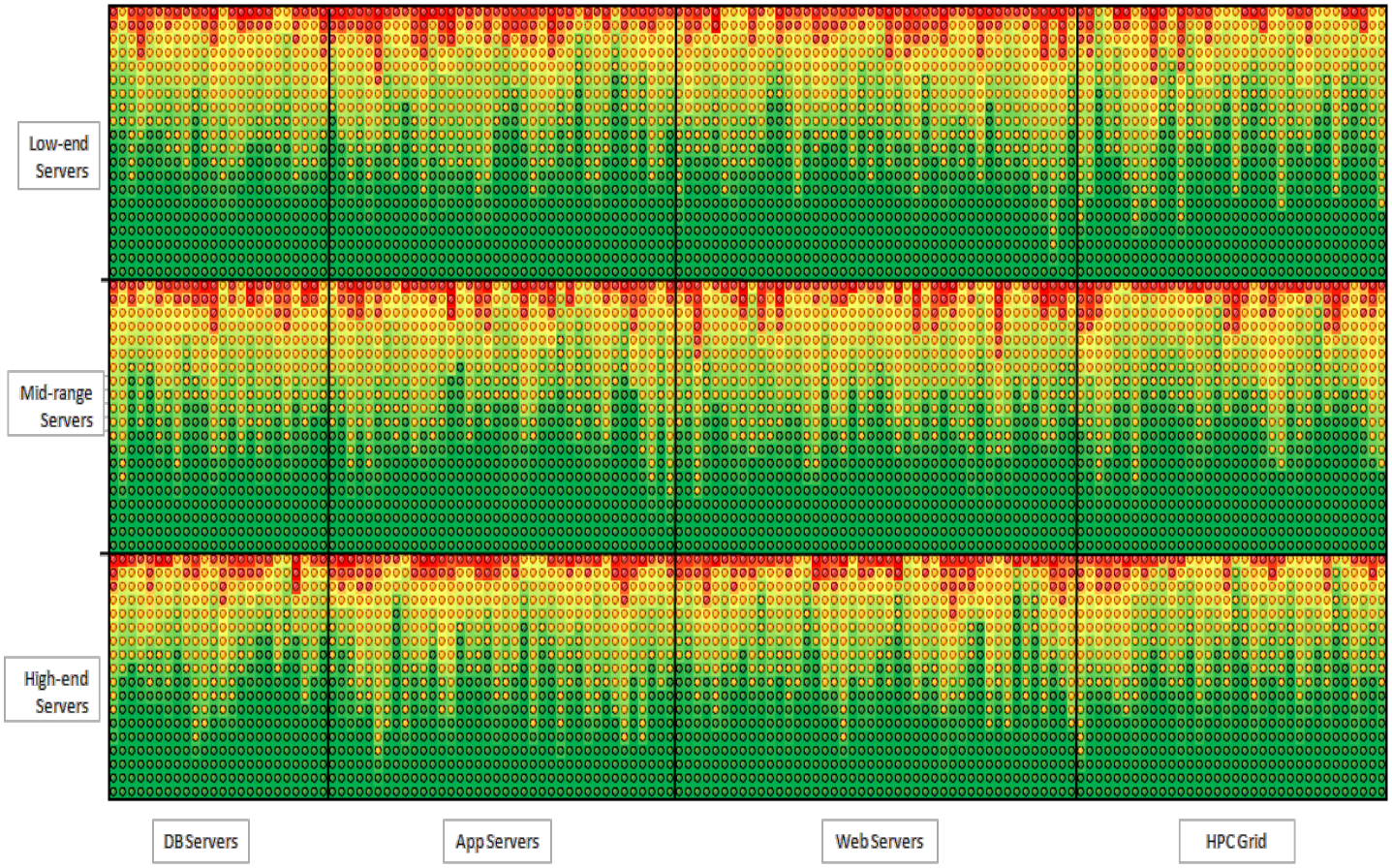
Key Players:
UX Architect, Technical Architect

Activities:
UI design of views, workflows, components and reports with documented behaviour of each interaction.

Interaction/Communication:
Design brainstorming meetings, Audio/ Video conference calls, emails

Typical Duration: 1-2 weeks

Deliverable:
UI wireframes that illustrate form & behaviour specification



Success Factors:
Consistent, Intuitive, Efficient & Aesthetic design of UI screens

UI Design Explorations

Exploration 5:
Single axis Heat Maps

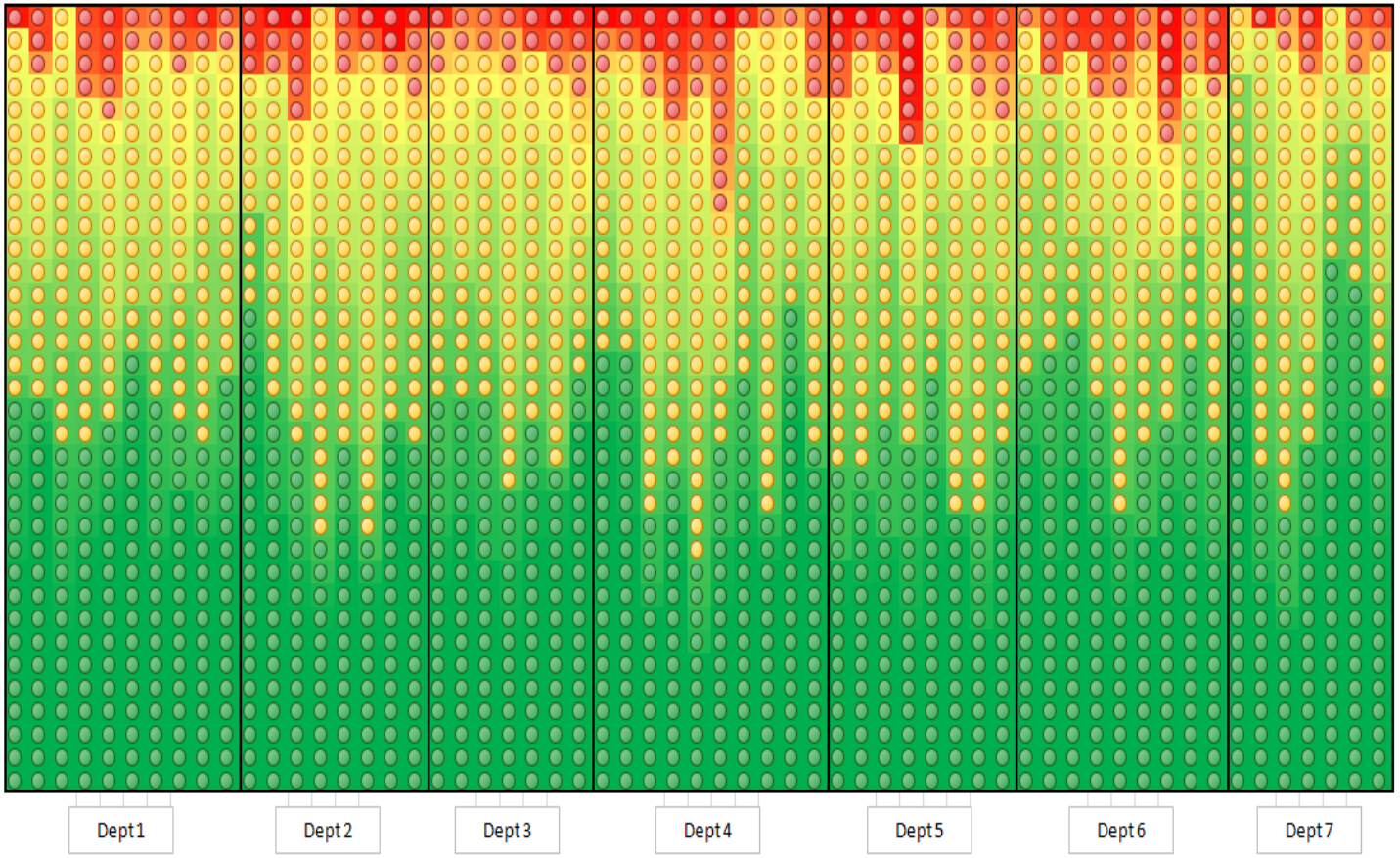
Key Players:
UX Architect, Technical Architect

Activities:
UI design of views, workflows, components and reports with documented behaviour of each interaction.

Interaction/Communication:
Design brainstorming meetings, Audio/ Video conference calls, emails

Typical Duration: 1-2 weeks

Deliverable:
UI wireframes that illustrate form & behaviour specification



Success Factors:
Consistent, Intuitive, Efficient & Aesthetic design of UI screens

Visual Experience

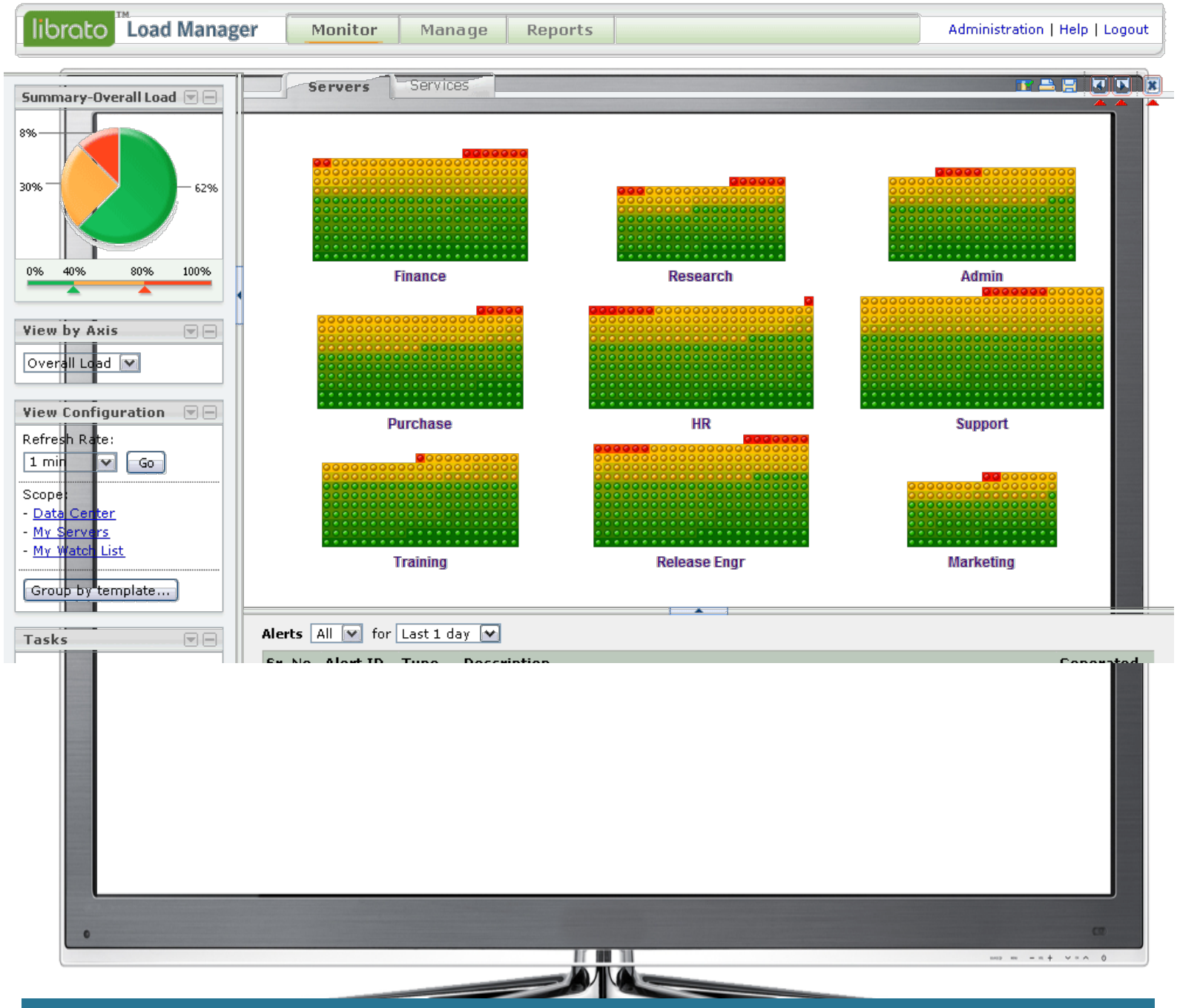
Key Players:
Technical Team & UX Team members

Activities:
Design Visual Identity – Typography, Color, Icons & graphics

Interaction/Communication:
Weekly meetings, audio calls, webex, emails

Typical Duration: 2-4 weeks

Deliverable:
Visual Resources – Icons, graphics & brand identity



Success Factors:
Creating a differentiated & engaging visual experience

Usability Testing

Key Players:
Users & Usability Testers

Activities:
Expert evaluation, end-user testing in lab – on UI mockups or alpha/beta quality product

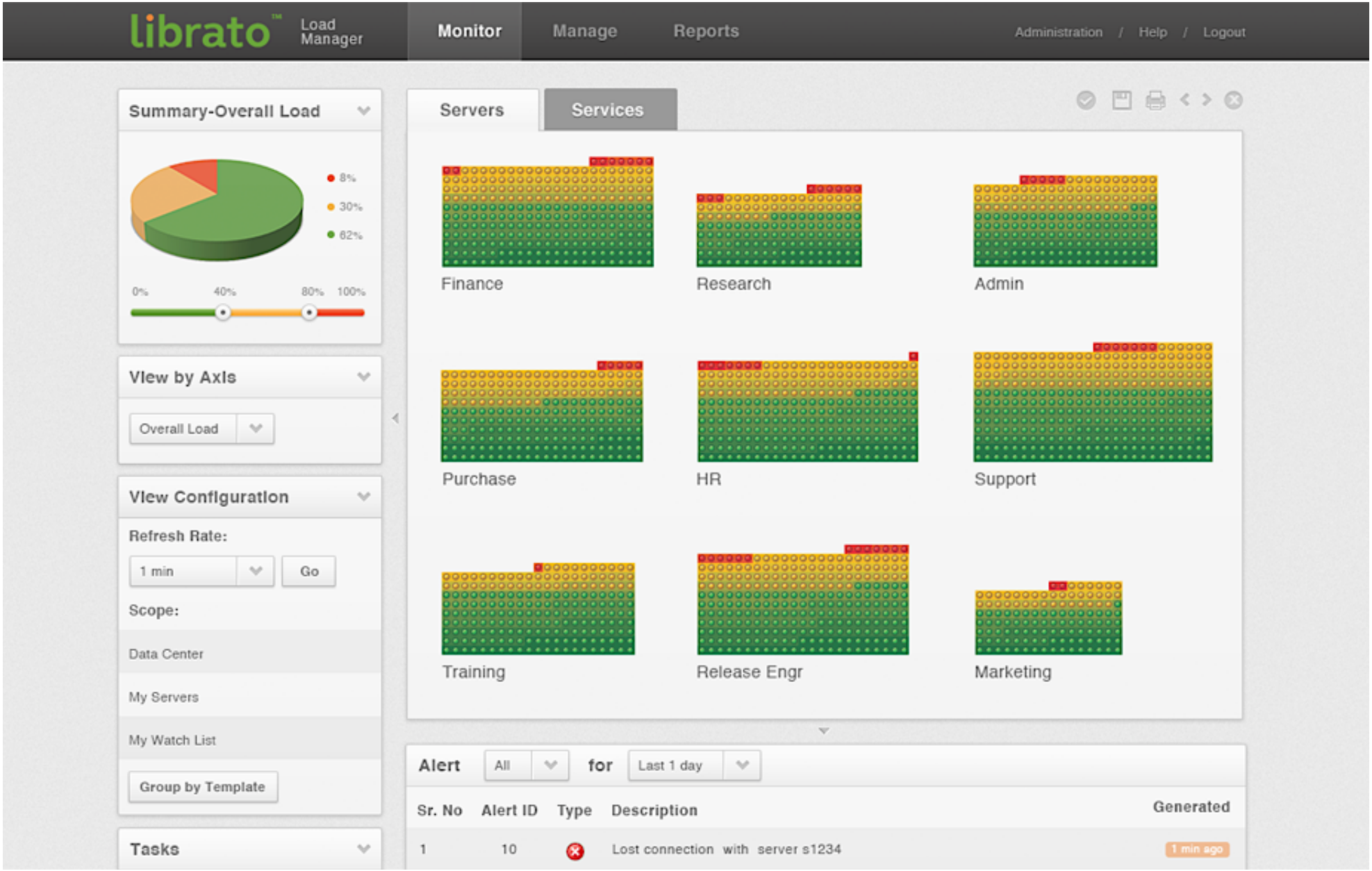
Interaction/Communication:
Lab Testing, Remote usability labs

Typical Duration: 1-2 weeks

Deliverable:
Usability report with recommendations of low-hanging & long-term fixes

Success Factors:
Discovering design flaws by user observation

BACK TO ENGINEERS



Design Considerations

- Web server to serve the response
- Cache which keeps status and high level info of all servers
- Database to store and retrieve data

Performance Impact

- Heavy on the Browser, Quickly reach data
- Light on the Web Server, small number of requests
- Heavy on the database (complex queries)
- Scale out on database

IMPACT

- Improved Usability
- Better managed performance bottle-necks

Contributions

- Improving Usability and Performance bottle-necks
- Discovering new requirements and features
- Simplifying the product and hence the architecture (Ericsson)