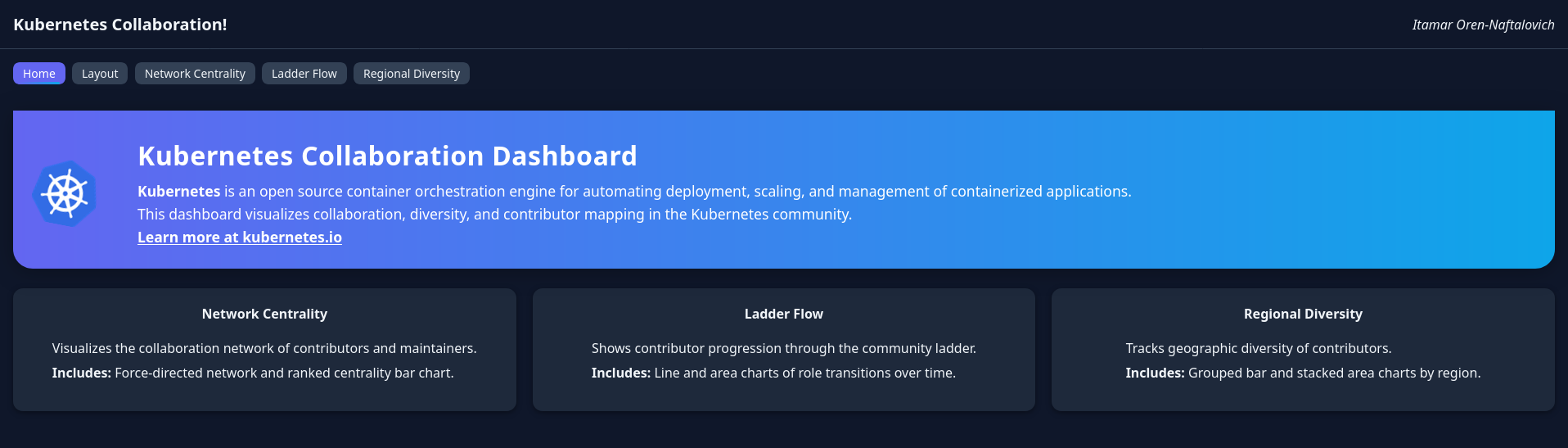
**Cover Page**

**Interaction Design Paper** **Kubernetes Collaboration Dashboard** **Author:** Itamar Oren-Naftalovich

**Site Layout** 

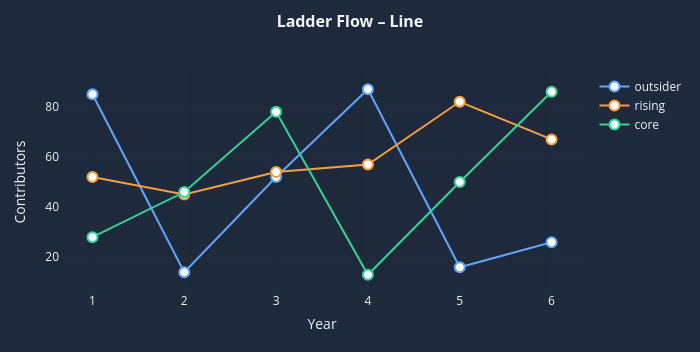
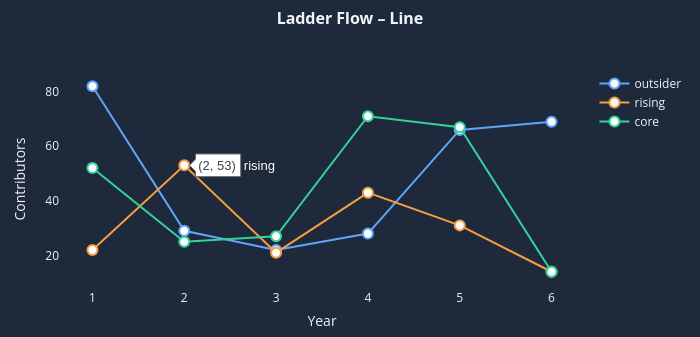
The prototype is of a dark-themed header with the title and author on the left, a horizontal tab bar that switches between five main views (Home, Layout, Network Centrality, Ladder Flow, Regional Diversity), and a “Home” grid of cards linking to each data view.

## PART 1

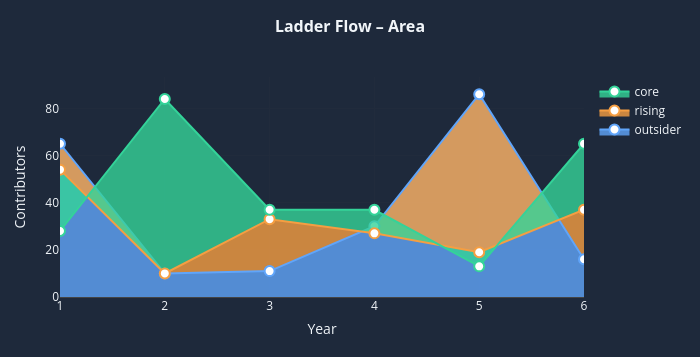
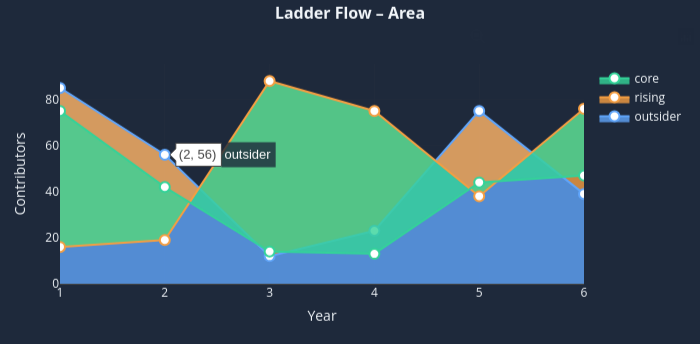
### Data Relationship #1: Contributor-Ladder Progression Flow

**Description:** Tracks counts of contributors as they move from their first pull request through role stages up to maintainer status over time.

#### Chart A – Stacked Area (Cohort Flow)

* **Pre-interaction:** 
* **Post-interaction:** 

#### Chart B – Line / Slope Chart

* **Pre-interaction:** 
* **Post-interaction:** 2

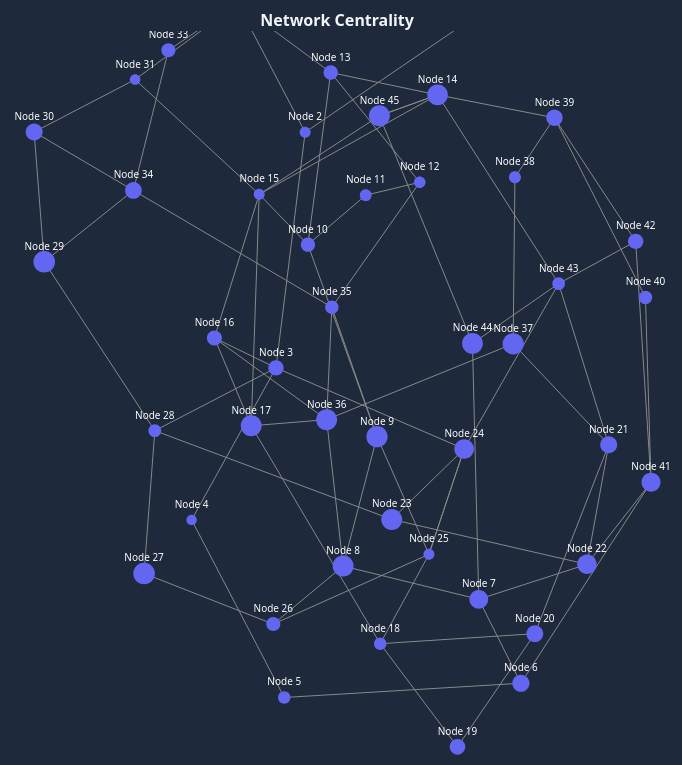
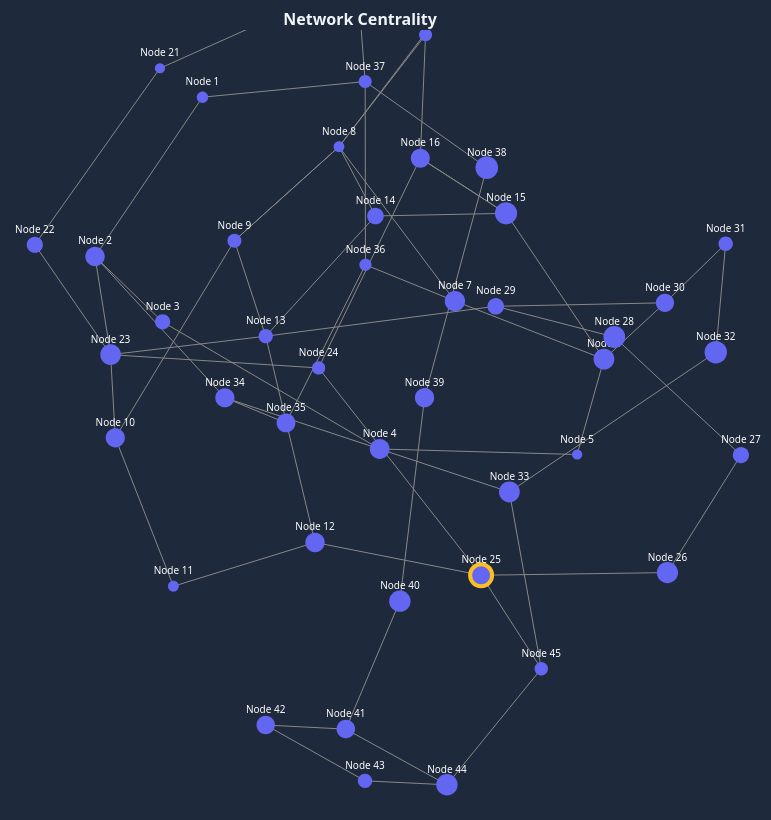
#### Discussion

* **Chart A**
  + **Interaction:** brush or hover to isolate a cohort, and clicking a stage highlights contributors currently at that rung
  + **Strengths:** shows overall retention and growth visually, and gives a measure of volume across stages
  + **Weaknesses:** exact quantities for small cohorts are hard to read, and color stacking can obscure minor flows
* **Chart B**
  + **Interaction:** hover shows exact counts per ladder stage, and the legend toggles to show/hide lines
  + **Strengths:** precise and uncluttered view of trends for each stage
  + **Weaknesses:** does not communicate inter-stage flow (at all), users need to mentally map the transitions
* **Best Choice:** Chart A has the strongest storytelling of progression because the stacked area makes retention and drop-off visually immediate.

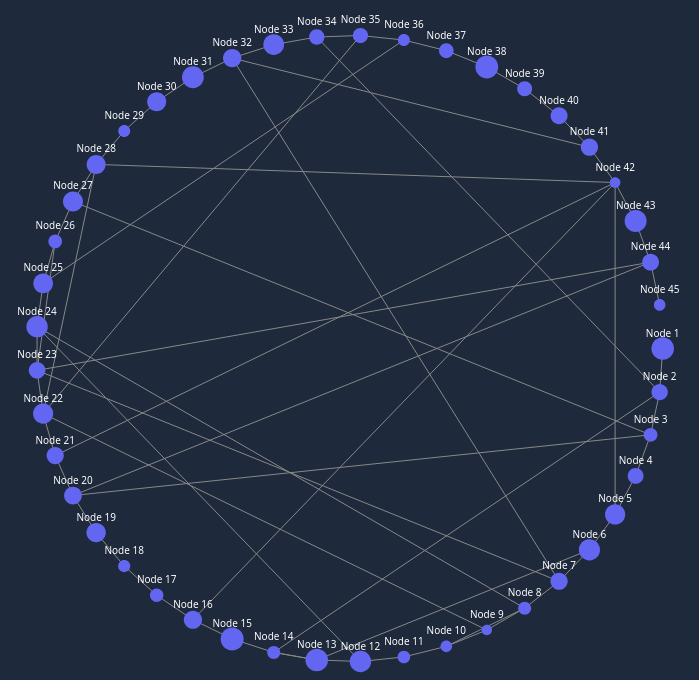
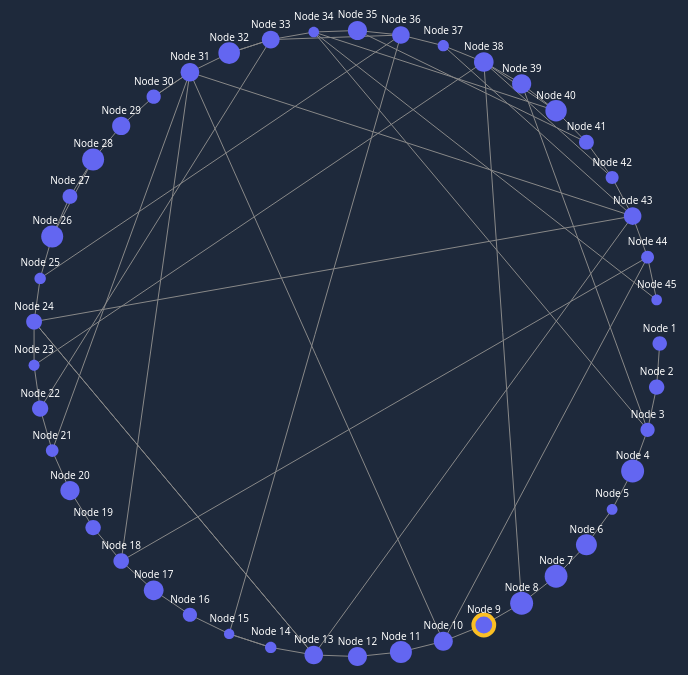
### Data Relationship #2: Network Centrality vs. Role Rank

**Description:** Compares node-degree and betweenness centrality scores against contributor role hierarchy.

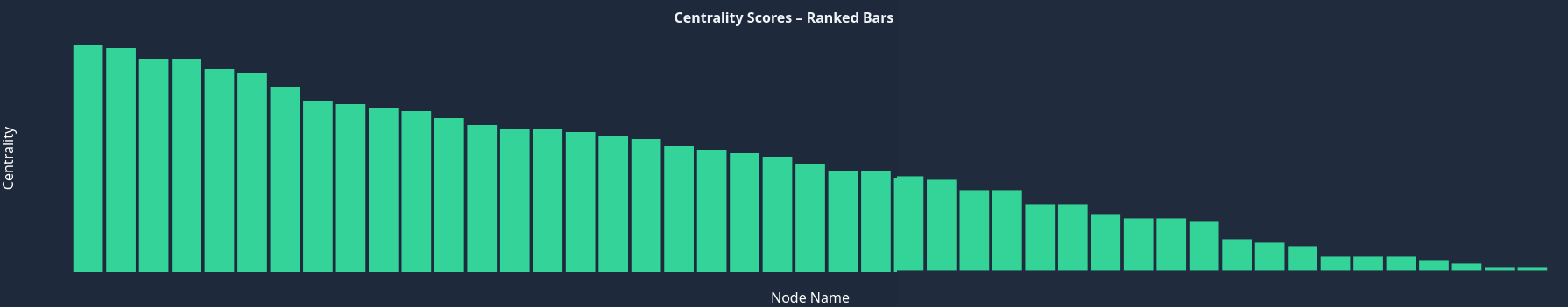
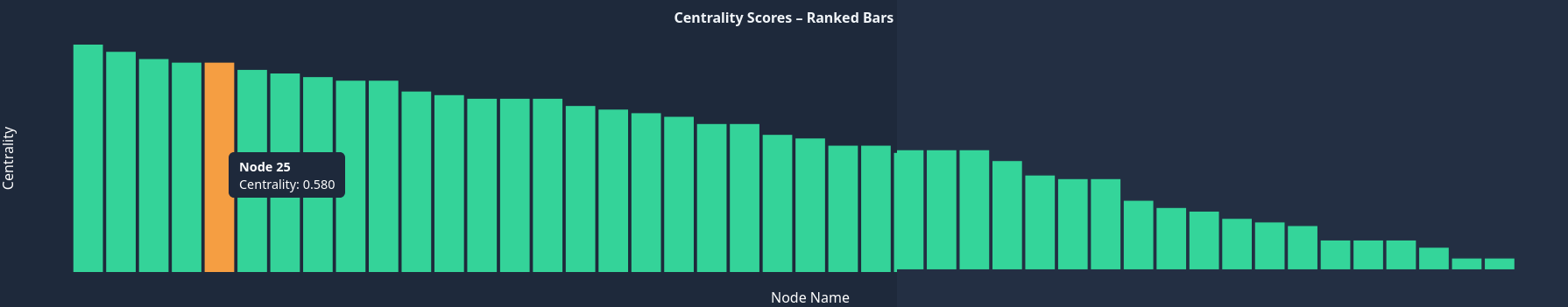
#### Chart A – Scatter Plot

* **Pre-interaction:** 
* **Post-interaction:** 

#### Chart A2 – Scatter Plot - Part II

* **Pre-interaction:** 
* **Post-interaction:** 

#### Chart B – Centrality Scores Bar Chart

* **Pre-interaction:** 
* **Post-interaction:** 

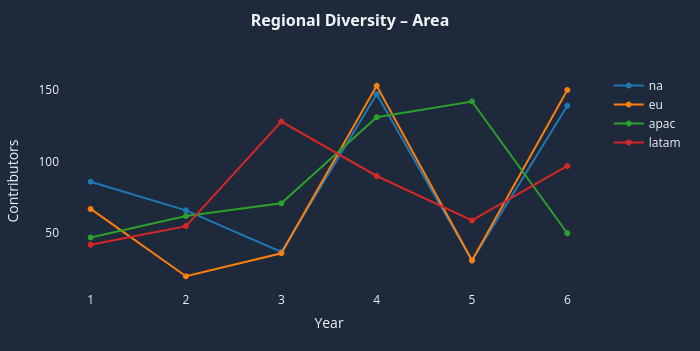
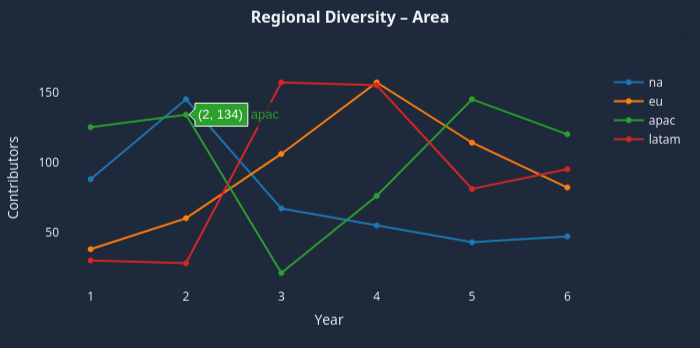
#### Discussion

* **Chart A**
  + **Interaction:** hover to show contributor details
  + **Strengths:** highlights outliers and overlap between roles, and spatial distribution is intuitive
  + **Weaknesses:** dense clusters can overlap, and might require color saturation for clarity (see chart A2 for fix)
* **Chart A2**
  + **Interaction:** same as A
  + **Strengths:** clearer than A since nodes will not overlap
  + **Weaknesses:** too many nodes will still be hard to read if the screen is too small. Also too many connections will make this illegable
* **Chart B**
  + **Interaction:** click a bar to higlight to individual contributors within that score bucket
  + **Strengths:** compact rank-ordered view, and easy aggregate comparison
  + **Weaknesses:** aggregation hides role-specific variance, and shows less engaging than spatial scatter
* **Best Choice:** Chart A2 preserves individual granularity and visually surfaces outliers critical to governance decisions. While I do like A1 more, putting it on a paper is…difficult.

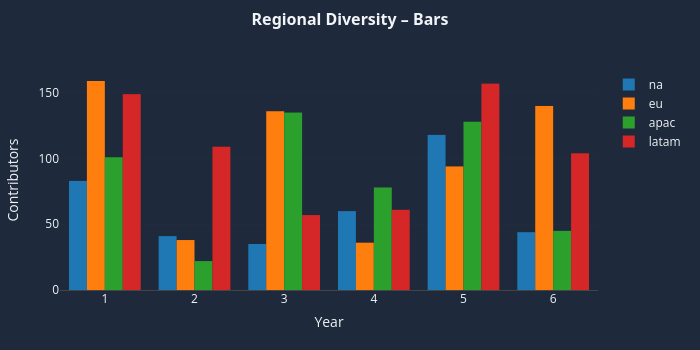
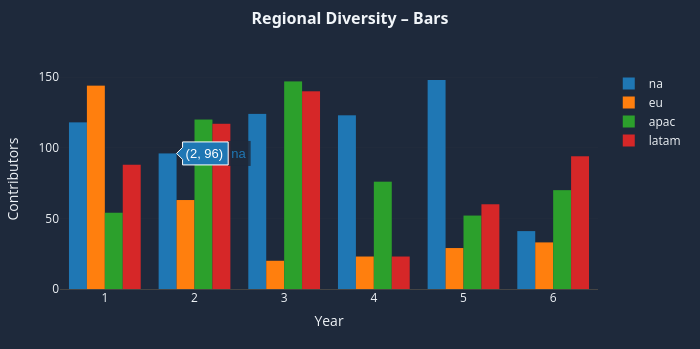
### Data Relationship #3: Geographic Diversity Over Time

**Description:** Shows counts of contributors per region across yearly intervals.

#### Chart A – Stacked Area by Region

* **Pre-interaction:** 
* **Post-interaction:** 

#### Chart B – Stacked Bars Snapshot

* **Pre-interaction:** 
* **Post-interaction:** 

#### Discussion

* **Chart A**
  + **Interaction:** hover slice to show absolute and % share, and toggle continents on/off
  + **Strengths:** demonstrates overall growth and proportional shifts clearly
  + **Weaknesses:** harder to compare small regions
* **Chart B**
  + **Interaction:** click a year to show tooltip with actual number of contributors
  + **Strengths:** straightforward year-over-year comparison and discrete bars help with exact reading
  + **Weaknesses:** trend perception is fragmented across many years, visual noise with too many bars
* **Best Choice:** Chart A provides a continuous view ideal for spotting long-term regional trends.

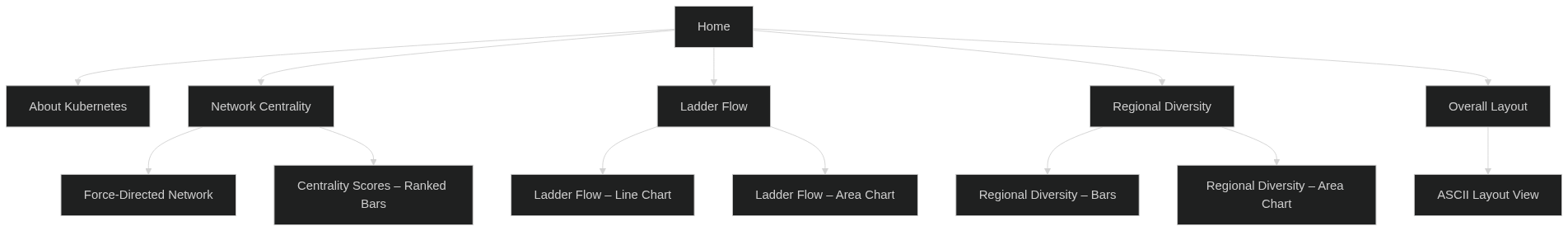
## PART 2

### Task Analysis

**Primary persona workflows:**

* **Maintainer Dashboard:** triage hotspot files, identify overloaded reviewers, review open KEPs
* **Contributor On-Ramp:** discover good-first-issues, connect with mentors, monitor PR queue
* **End-User Incident View:** map open bugs to releases, assess lead-time to patch incidents

### DIAGRAM of the Organization of the Interactive Program

[](https://mermaid.live/edit#pako:eNp1U9FumzAU_RXrPpMI0gCBh0kdKFq1rpPSqQ8bU-XCbWIV7Opi1mVRpP3D_nBfUtuQNE3aJ9vnnnN8fG1voFQVQgr3tXoqV5w0-5YXkrFPqsEfBdihgJ87hI1GH9j5neq0qbmRfe7ukCRqbI95GUpNvBZ6bchXqJ8UPRyAx_RLXlVIhtpP2NwkOubk4hdS2zsucCmU5PULeOq47pN-NQRe1wMw0F6SOPJVdjtkNIK5ohJHuSAsNVZsKLwr_MipNaqDwnWpCFv2_-8_tuDywXhYzmAwHNBFnN9eComvT-1kFmaZvZE3VeeE_A2VhV-p9s1xwkW-y3raPac_SHmiHLZ8R3myc9_s_sVcZxcX9sXYcVe4EWjvFzxYkqggved1ix40SA23a9hYlwL0Cu0bTM204vYSCrk1okcuvyvVQKqpMzJS3XK1N-keK64xF3xJvNmjhNI0K1Od1JAGSeJMIN3Ab0ijYOwnURglfhRM4uTMg7XhTIJx5IdBEMdJPAuDMNp68Mft6o-TyJ9NpuF0Gs6m8dlk5gFWQiv60n8o96-2z8DMHQA)

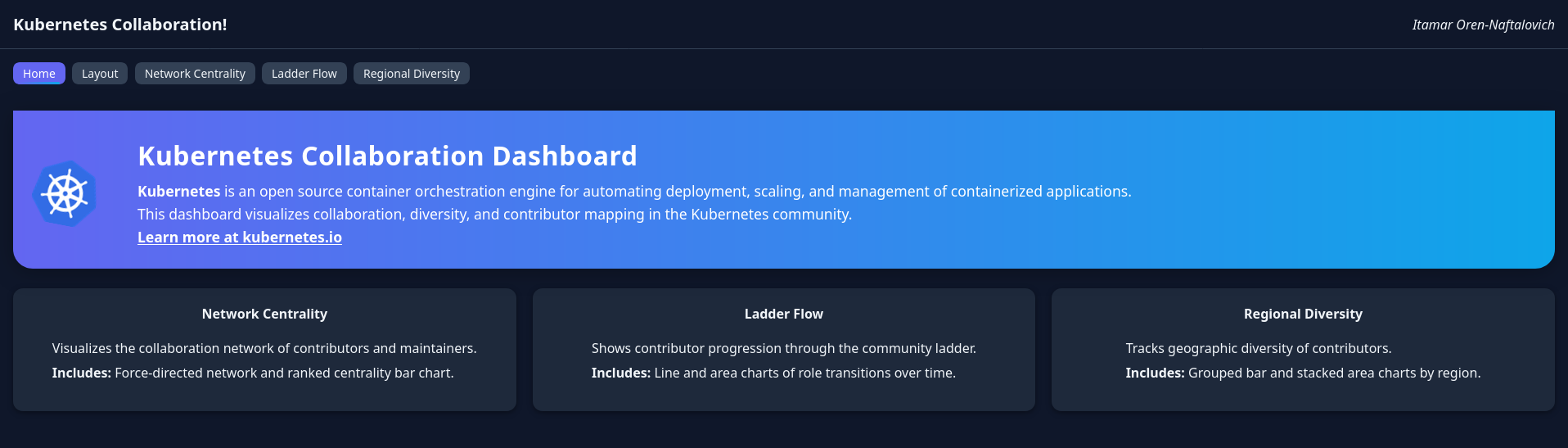
### Performance Objectives & Content Outline

| **Section** | **Performance Objectives** | **Content Outline** | **Charts** | **Filters** |
| --- | --- | --- | --- | --- |
| **Home (Overview)** | orient users to the dashboard’s purpose; provide entry points to each analysis view | header, intro paragraph, three clickable cards | — | — |
| **Layout** | reveal site navigation structure and user journeys; clarify page interconnections | site-map diagram, legend | static mermaid diagram | — |
| **Network Centrality** | surface key influencers in the contributor graph; enable exploration of individual and aggregate centrality | force-directed network, ranked-bar chart, descriptive caption | network graph, bar chart | toggle layout view |
| **Ladder Flow** | reveal contributor retention and progression through ladder stages; enable cohort selection | stacked-area cohort flow, multi-line stage trends | stacked area, line chart | cohort year, ladder stage filter |
| **Regional Diversity** | highlight geographic expansion of the community; compare regional contributions over time | grouped bar by year, stacked-area timeline | grouped bar, stacked area | region toggle, time slider |

## PART 3

### SCREEN DESIGNS (Storyboard)

#### Opening Screen

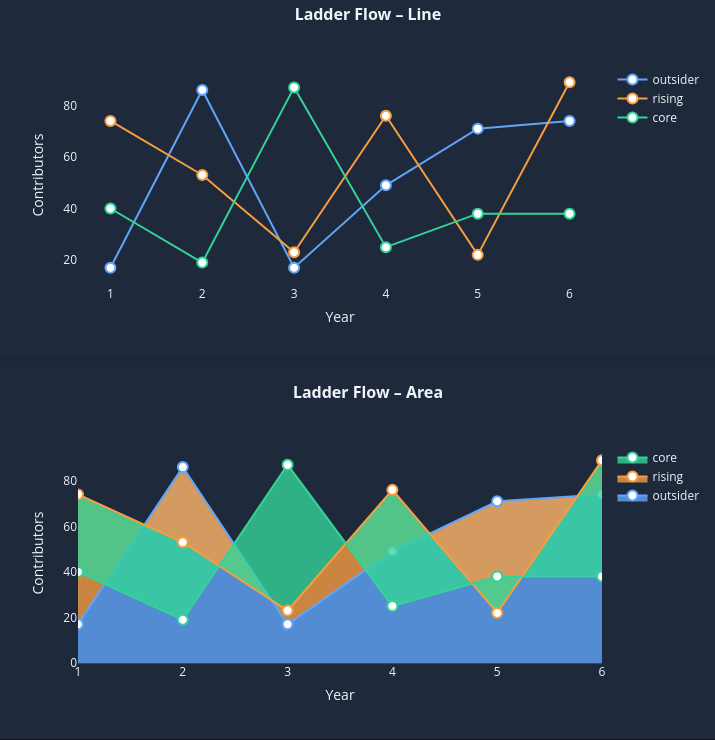


alt text

* **Performance Objectives:** welcome and guide users to core analyses
* **Text:** “Kubernetes Collaboration Dashboard”
* **Graphics & Design:** high-contrast, color-blind–safe palette, and animations on the cards to indicate you can click on them
* **Interaction & Navigation:** clicking a card or tab button routes to the relevant view

#### Data Visualization Screens

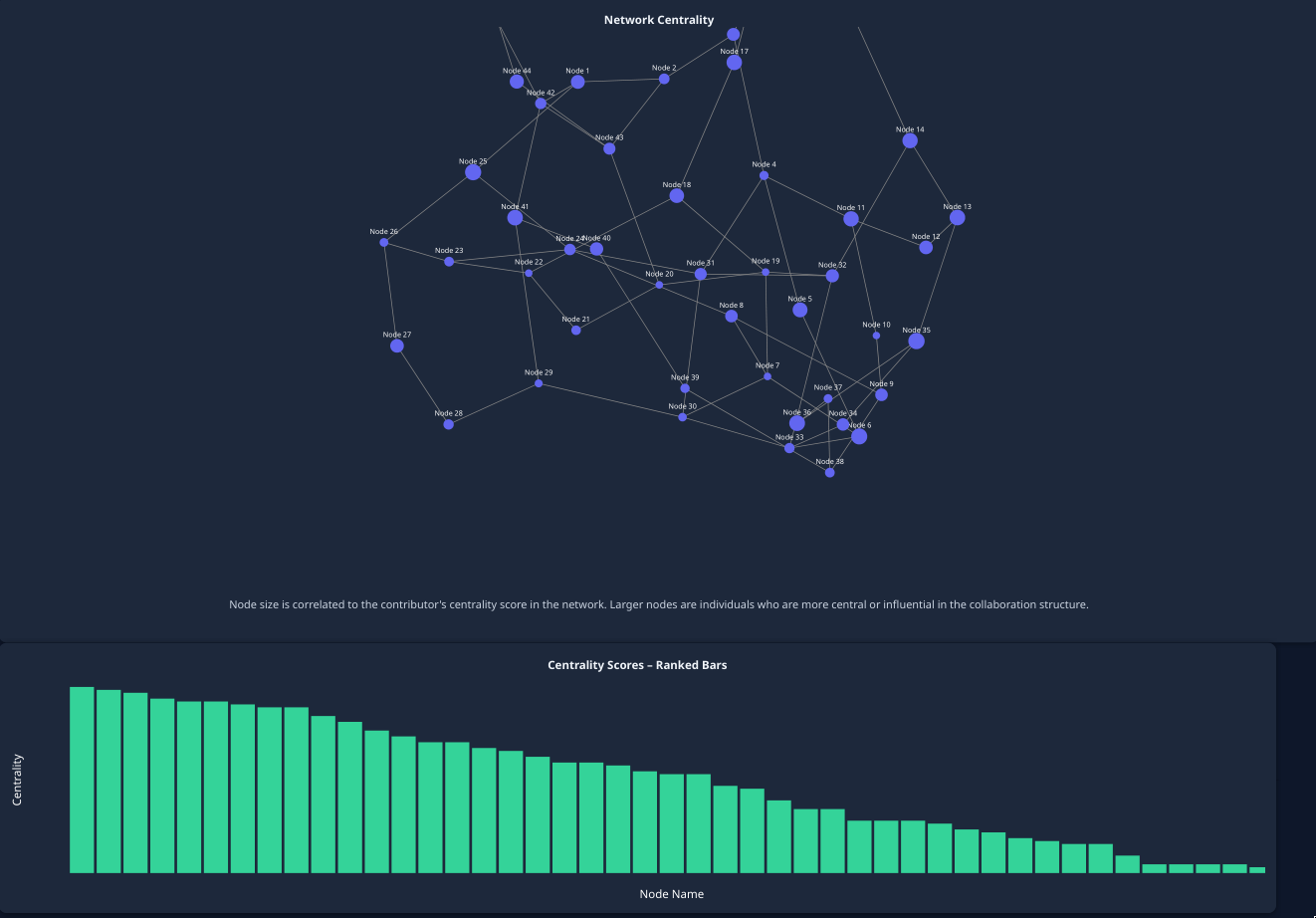
##### Contributor Ladder Flow



alt text

* **Data Charts:**
  + **Line chart** (#ladder-line): displays the count of contributors at each ladder stage over time.
  + **Area chart** (#ladder-area): stacked view showing cohort progression through the ladder.
* **Data Relationship:** illustrates how retention and advancement rates vary for contributor cohorts as they progress from first pull request to maintainer.
* **Purpose of Charts:**
  + **Line chart:** emphasizes precise trend analysis for each stage.
  + **Area chart:** conveys the narrative of flow and drop-off between stages.
* **Filters:**
  + **Cohort year selector:** choose the cohort start year.
  + **Ladder stage toggle:** include or exclude specific stages from the display.
* **Interactions:**
  + **Hover:** reveal tooltips with exact counts and percentages.
  + **Click:** isolate a cohort or stage to focus the view on that subset.
* **Color Palette:** sequential blues mapped to ladder hierarchy, meeting WCAG AA contrast requirements.

##### Network Centrality



alt text

* **Data Charts:**
  + **Force-directed network** (#centrality-network): visualizes collaborator connections and influence pathways.
  + **Ranked bar chart** (#centrality-bars): orders contributors by centrality score for quick comparison.
* **Data Relationship:** compares node-degree and betweenness centrality across contributor roles to surface key influencers.
* **Purpose of Charts:**
  + **Network graph:** reveals the relational structure of contributions.
  + **Bar chart:** provides a clear, rank-ordered view of centrality metrics.
* **Filters:**
  + **Layout toggle:** switch between force-directed and radial network layouts.
* **Interactions:**
  + **Hover:** display contributor details (name, role, score).
  + **Click:** drill into the list of contributors within a given rank or network cluster.
* **Color Palette:** distinct hues assigned by contributor role category for rapid visual differentiation.

##### Regional Diversity



alt text

* **Data Charts:**
  + **Grouped bar chart** (#diversity-bars): compares regional contributor counts year-over-year.
  + **Stacked area chart** (#diversity-area): shows cumulative geographic distribution over time.
* **Data Relationship:** tracks how the community’s regional composition shifts across months and years.
* **Purpose of Charts:**
  + **Grouped bars:** enable precise year-to-year comparisons.
  + **Area chart:** highlights continuous growth and proportional changes.
* **Filters:**
  + **Region legend toggle:** include or exclude specific regions.
  + **Time-range slider:** adjust the temporal window of interest.
* **Interactions:**
  + **Hover:** show absolute counts and percentage share per segment.
  + **Click legend items:** add or remove regions from the visualization.
* **Color Palette:** employs a color-blind-safe set with one unique hue per region for accessibility and clarity.