Interactive Visualisation 3

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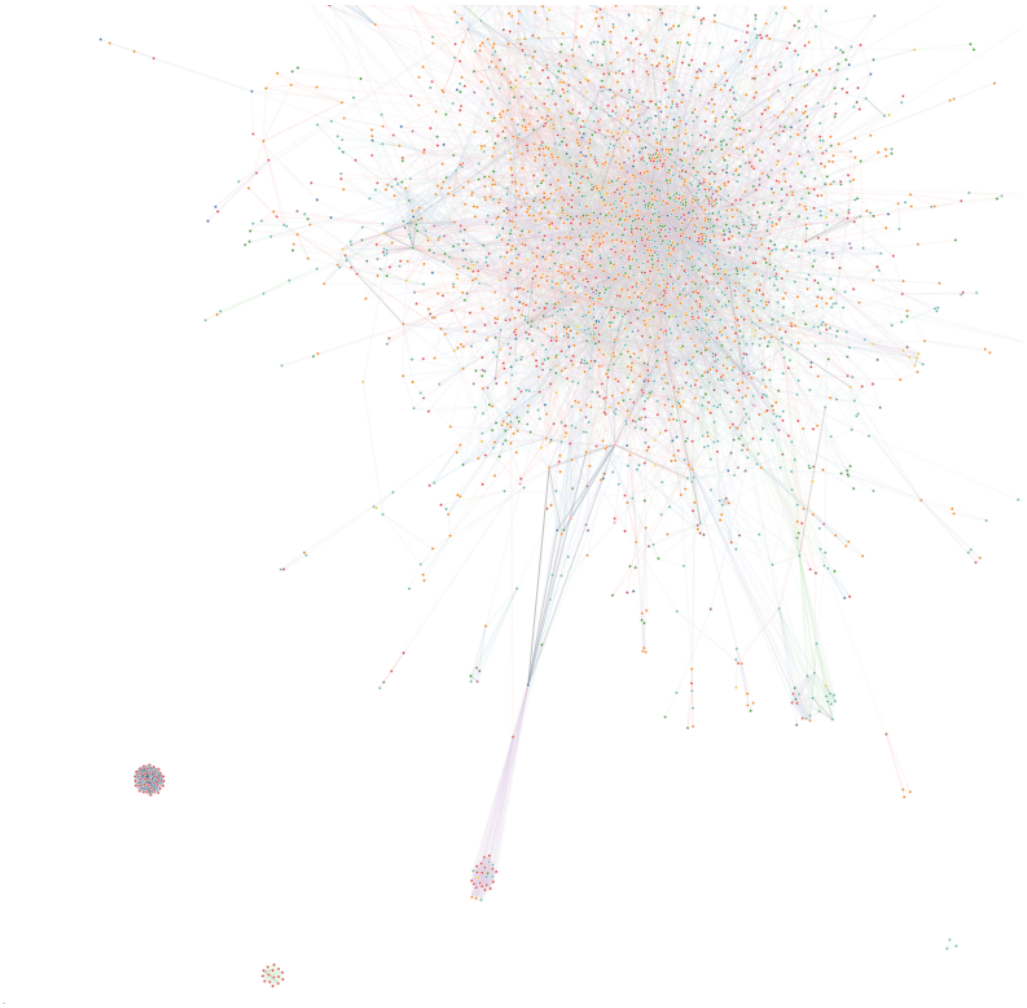
In the journey to uncover potential entities involved in illegal fishing activities, a comprehensive visual analytic approach was employed. Utilizing network visualizations, this study embarked on identifying, analyzing, and distilling vital information that can help in suspecting culprits.

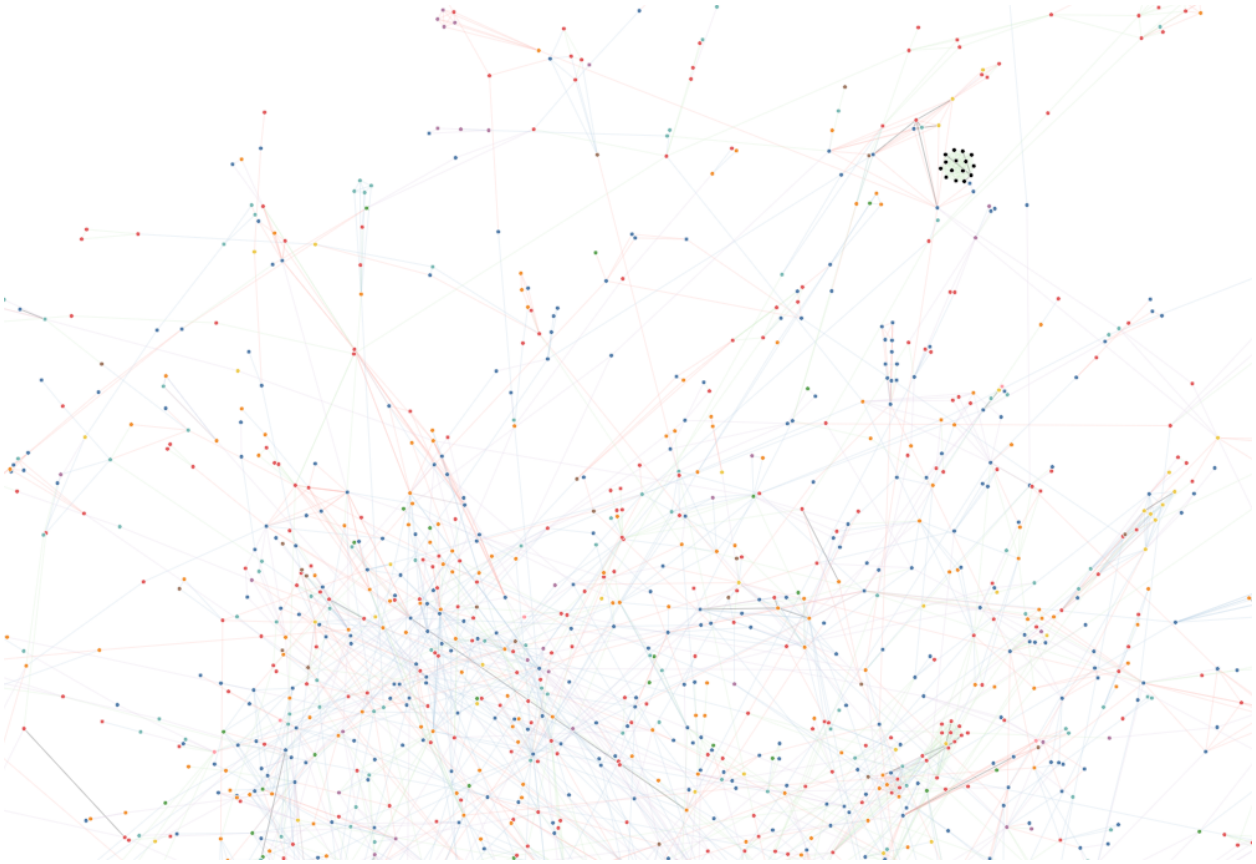
First Phase - Overview of Network Structure:

In the initial phase of the analysis, a comprehensive overview of the entire network was drawn to examine the intricate web of connections among the various entities. This panoramic visualization gave a zoomed-out perspective, showcasing both dense and sparse areas within the network. Interestingly, the observation also highlighted some sub-graphs, which were not connected to the main network. These disconnected clusters immediately stood out, drawing curiosity and suspicion about their isolation and possible covert activities.



Second Phase - Simplification and Focus on Outliers:

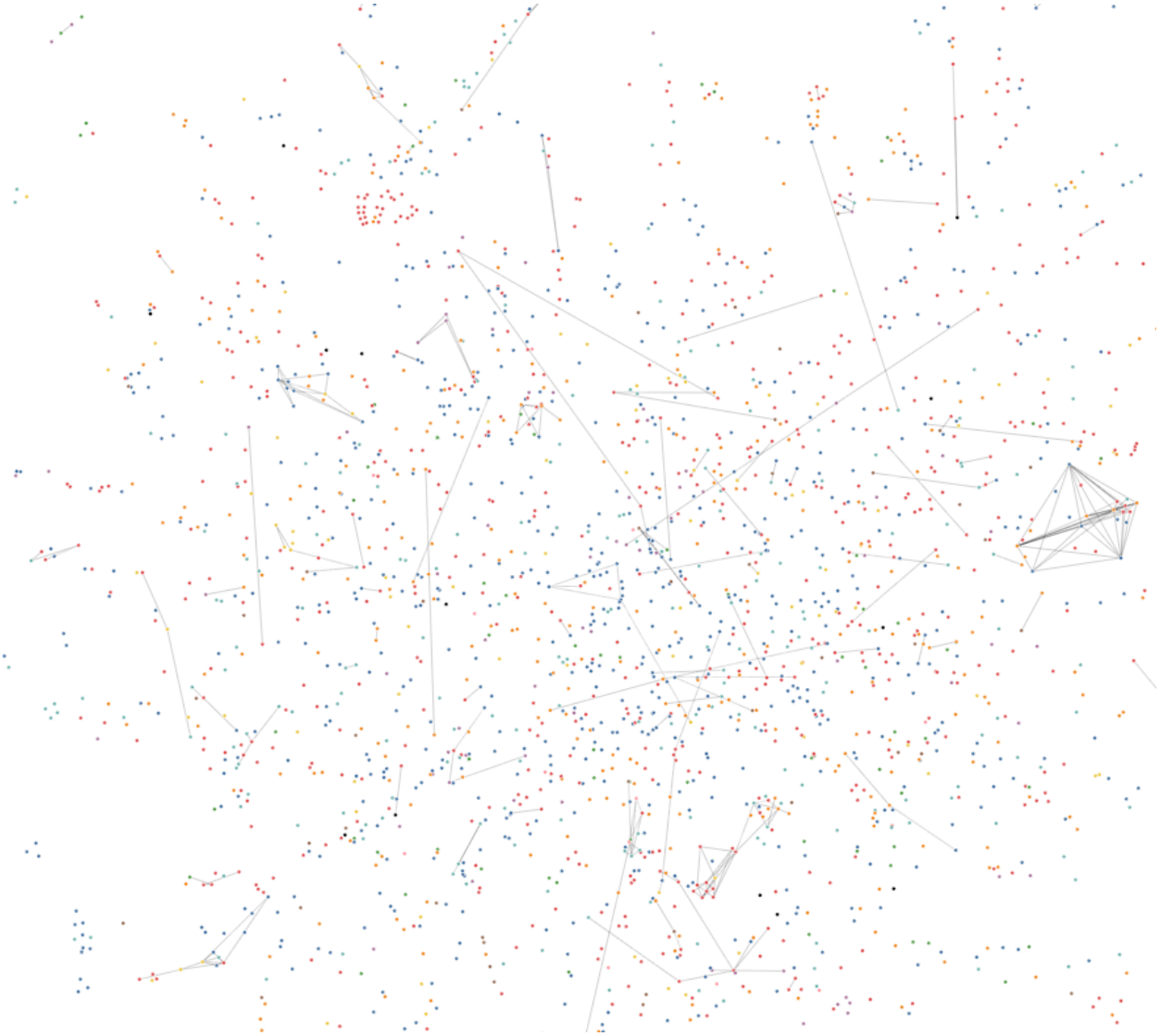
To facilitate a more focused investigation, the network was simplified by removing nodes with more than 50 degrees along with their associated links. The assumption driving this strategic decision was that entities with such a high degree of connectivity are less likely to be involved in illegal fishing activities. Their engagement in legitimate operations potentially subjects them to a greater risk of exposure and a subsequent harm to their reputation if found complicit in illegal fishing activities.



Third Phase - Pruning Outliers and Highlighting Suspicious Links:

In the subsequent stage of this visual analytics investigation, a decision was made to remove the outlier sub-graphs identified earlier, ones with nodes bearing special characters and their associated links. This strategy emerged from the observation that these nodes were densely interconnected among themselves, further enhancing their outlier status by not having links with the main network. Consequently, this raised the possibility of concealed illicit activities, thus making the removed nodes potential subjects for further investigation.

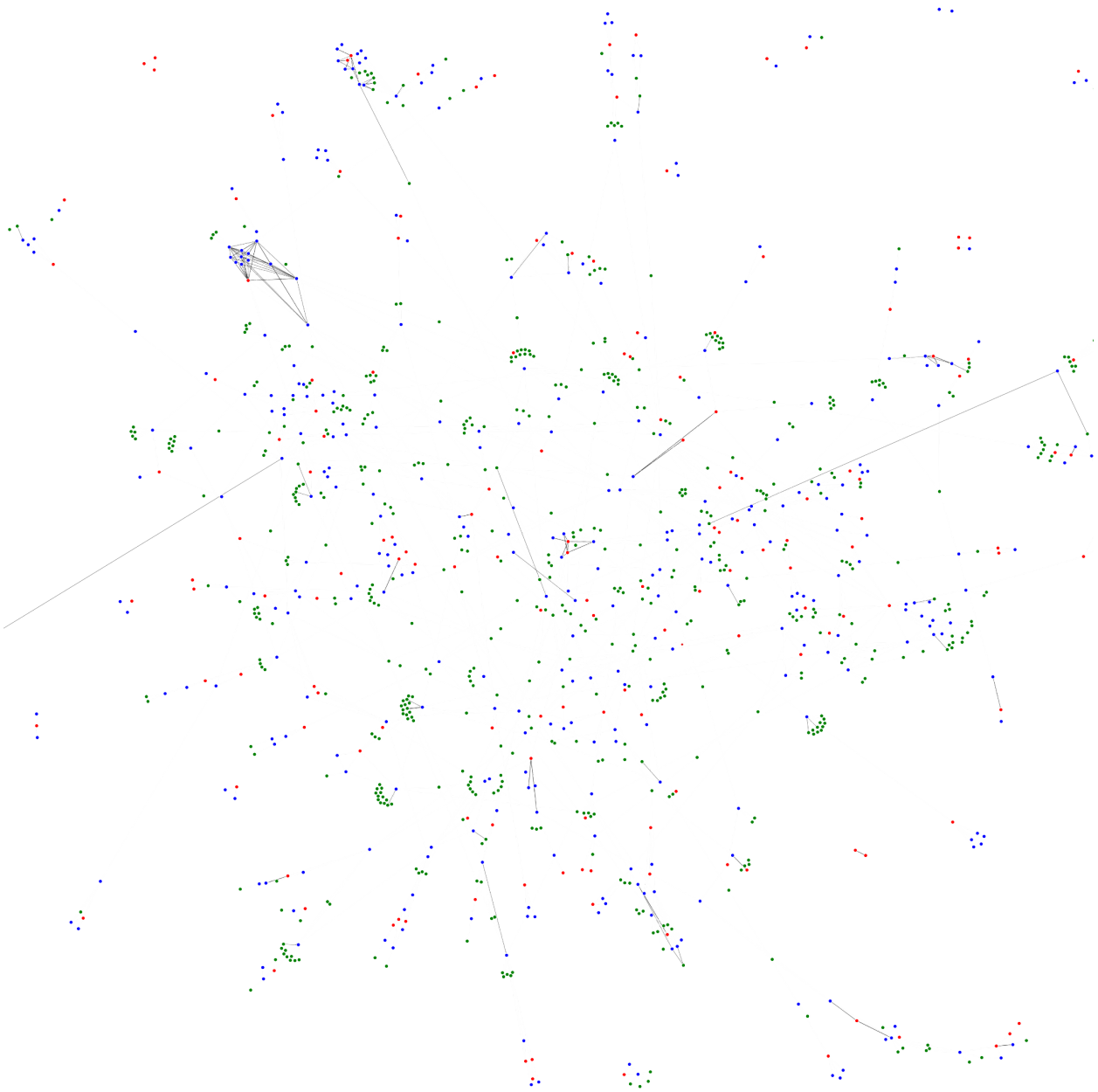
The third visualization introduced an additional feature, enabling the viewer to focus on links with a weightage of 0.95 (represented in black). Notably, upon close inspection, it was observed that nodes associated with links of lesser weight typically bore legitimate names and entities. In contrast, those associated with higher weighted links (0.95 and above) often incorporated special characters and were suspiciously interconnected with similarly characterized nodes.



Fourth Phase - Isolating Suspicious Nodes and Analyzing Connections:

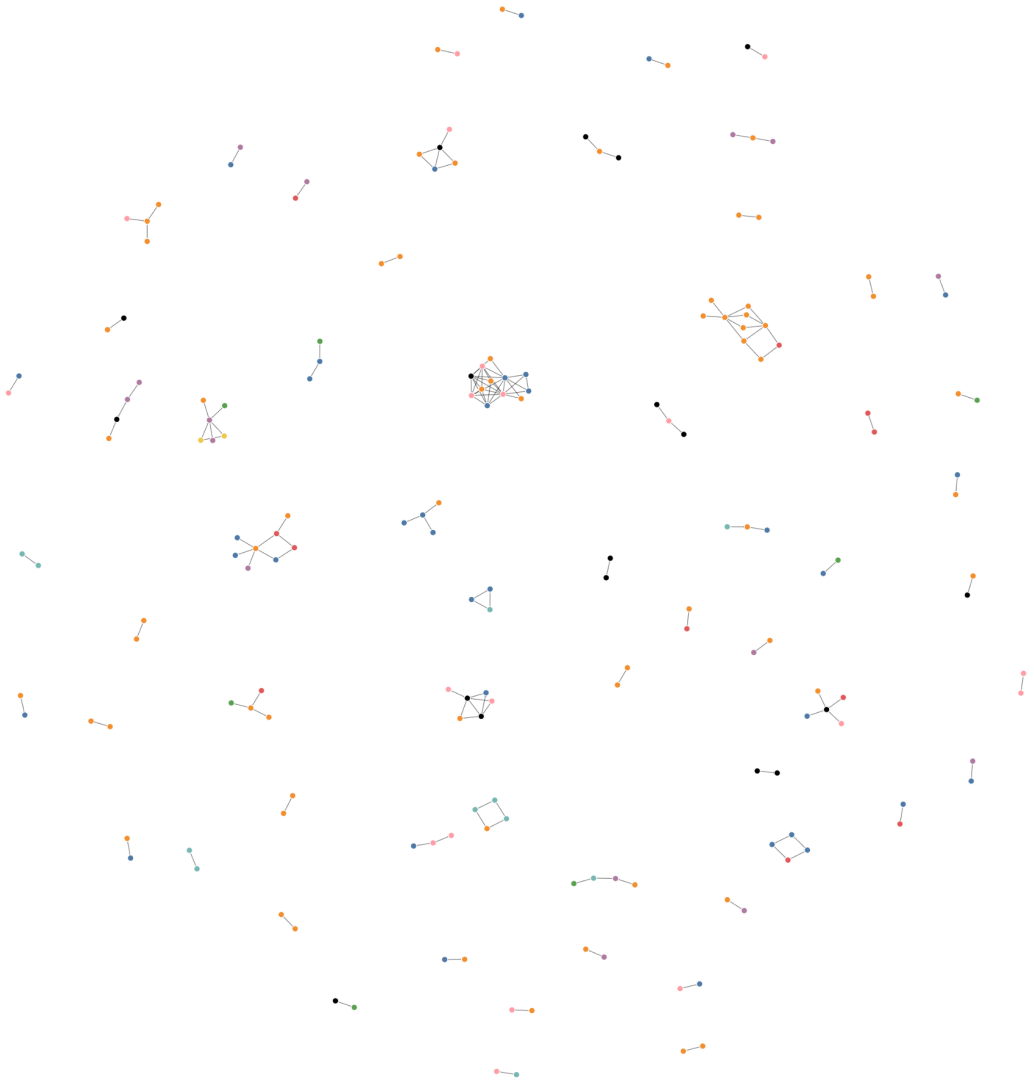
In the fourth visualization, the focus was exclusively on nodes with special characters. This image maintained the earlier applied parameter of highlighting/darkening links with a weight of 0.95 or more. A recurring pattern was identified here as the majority of the suspicious links from the previous visualization reappeared, raising the suspicion level of nodes associated with these links.

To enhance the effectiveness of this visualization, the suspect nodes with special characters were rendered in red, their immediately connected nodes in blue, and second-degree nodes in green. Strikingly, most of the highlighted links (with a weight of 0.95 or more) originated from the red and blue nodes, implying a potential correlation between these nodes and suspected illegal activities.



Fifth Phase - Focusing on High Weight Links and their Associations:

In the final visualization, the focus was solely on the nodes and their corresponding links with a weight of more than 0.97. After thoroughly analyzing each link by hovering over them, several significant observations were made.



Firstly, most of the nodes appeared legitimate, but some displayed suspicious features, particularly those grouped into small clusters with link weights exceeding 0.97. Upon careful examination, one of the nodes was identified as 'illegal', which was earlier used to determine an illegal entity in a previous assignment. This node was connected to entities such as Odisha Sea

Dry dock LLC Consultants, Yu Gan BV Investment, and individuals like Gary Butler, Gary Smith, and Ryan Garrett, suggesting these as potential entities for further investigation.

The second cluster of nodes was formed by unusual terms like 'criminally', 'Exploitation', and 'Restrain', which were all linked to a peculiar location 'f656719b-783e-452b-801f-f60895068b23'. This location was associated with individuals such as David Nielsen, Walter Graham, Kenneth Cain, and entities like Faroe Islands Shrimp Shark and 979893388. Given their close association, these individuals and entities warrant attention.

Lastly, the term 'Rapido beam trawler', a type of fishing vehicle known for large-scale fishing and ecological damage, was linked to a node named 'Madison Franklin'. This association raises suspicion about this particular entity and its fishing practices.

Conclusion:

Through a systematic visual analytics approach, this investigation has shed light on a number of entities and individuals that FishEye should consider for further investigation into potential illegal fishing activities. The network visualization has not only identified isolated sub-graphs and nodes with special characters but has also highlighted links with high weightages. These visual cues have allowed for the detection of suspicious patterns within the network.

Entities such as Odisha Sea Dry dock LLC Consultants, Yu Gan BV Investment, Faroe Islands Shrimp Shark, 979893388, and Madison Franklin, as well as individuals like Gary Butler, Gary Smith, Ryan Garrett, David Nielsen, Walter Graham, and Kenneth Cain are recommended for further scrutiny.

The application of visual analytics in this investigation demonstrates its power as a tool for extracting insights from complex networks. It has facilitated the identification of potential culprits by highlighting anomalous features and behaviors, providing a solid foundation for targeted investigations into illegal fishing activities. While it does not confirm illegality, it provides an evidence-based approach to guide further probing, thereby optimizing FishEye's efforts to promote responsible fishing practices.