8. Agglomerative Clustering

In [ ]:
```
from clustimage import Clustimage
```

In [ ]:
```
cl = Clustimage()
```

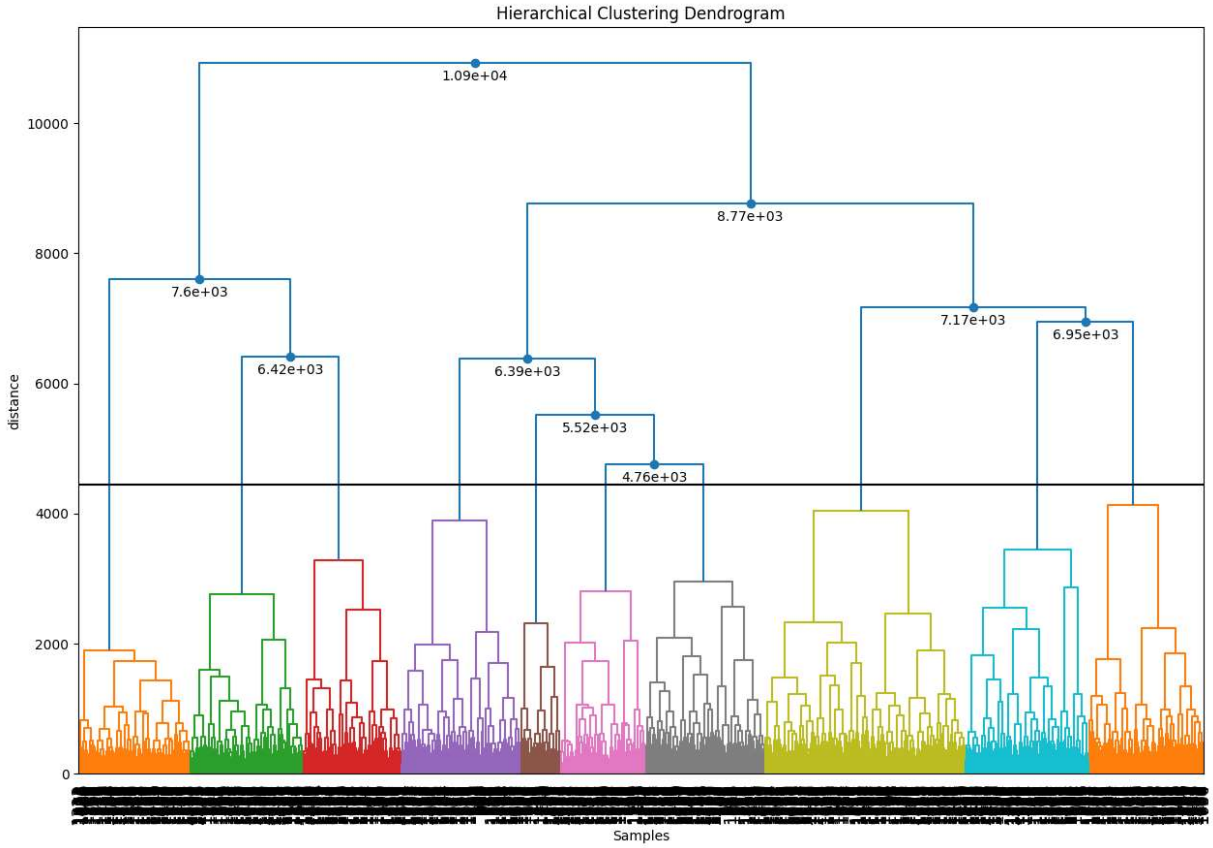
In [ ]:
```
X = cl.import_example(data='mnist')
```

In [ ]:
```
result = cl.fit_transform(X, cluster='agglomerative')
```

```
[clustimage] >INFO> Cleaning previous fitted model results
[clustimage] >INFO> Reading and checking images.
[clustimage] >INFO> Scaling images..
[clustimage] >INFO> Writing images to tempdir [C:\Users\jainm\AppData\Local\Temp\clu
stimage]
100%|██████████| 1797/1797 [00:01<00:00, 915.18it/s]
[clustimage] >INFO> Extracting features using method: [pca]
[clustimage] >INFO> Extracted features using [pca]: samples=1797, features=29
[pca] >Column labels are auto-completed.
[pca] >The PCA reduction is performed to capture [95.0%] explained variance using th
e [64] columns of the input data.
[pca] >Fit using PCA.
[pca] >Compute loadings and PCs.
[pca] >Compute explained variance.
[pca] >Number of components is [29] that covers the [95.00%] explained variance.
[pca] >The PCA reduction is performed on the [64] columns of the input dataframe.
[pca] >Fit using PCA.
[pca] >Compute loadings and PCs.
[clustimage] >INFO> Compute [tsne] embedding
[clustimage] >INFO> Cluster evaluation using the [high] feature space of the [pca] f
eatures.
[clusteval] >Fit using agglomerative with metric: euclidean, and linkage: ward
[clusteval] >Evaluate using silhouette.
100%|██████████| 22/22 [00:02<00:00, 10.84it/s]
[clustimage] >INFO> Updating cluster-labels and cluster-model based on the (1797, 2
9) feature-space.
[clusteval] >Compute dendrogram threshold.
[clusteval] >Optimal number clusters detected: [10].
[clusteval] >Fin.
```

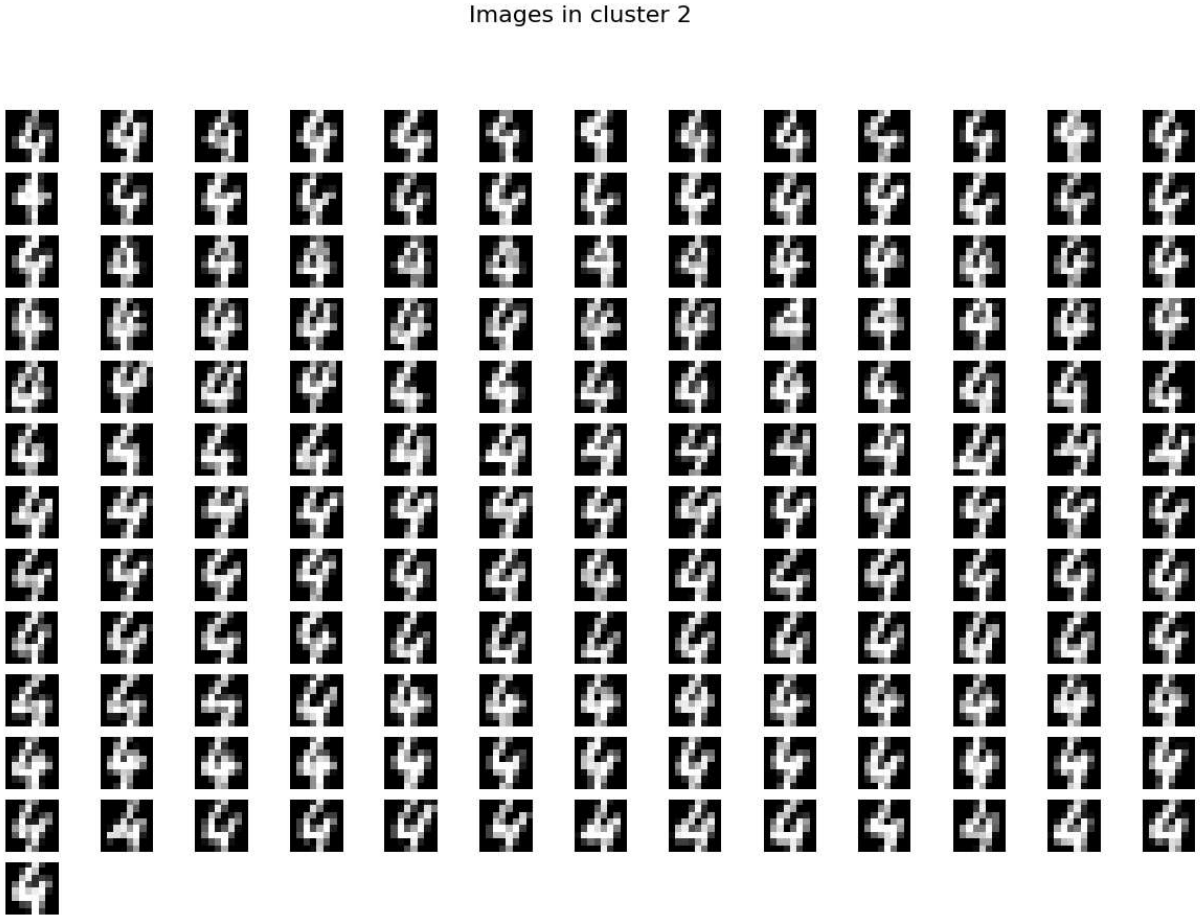
In [ ]:
```
cl.dendrogram()
```

```
[clusteval] >Plotting the dendrogram with optimized settings: metric=euclidean, link
age=ward, max_d=4445.957. Be patient now..
[clusteval] >Compute cluster labels.
```

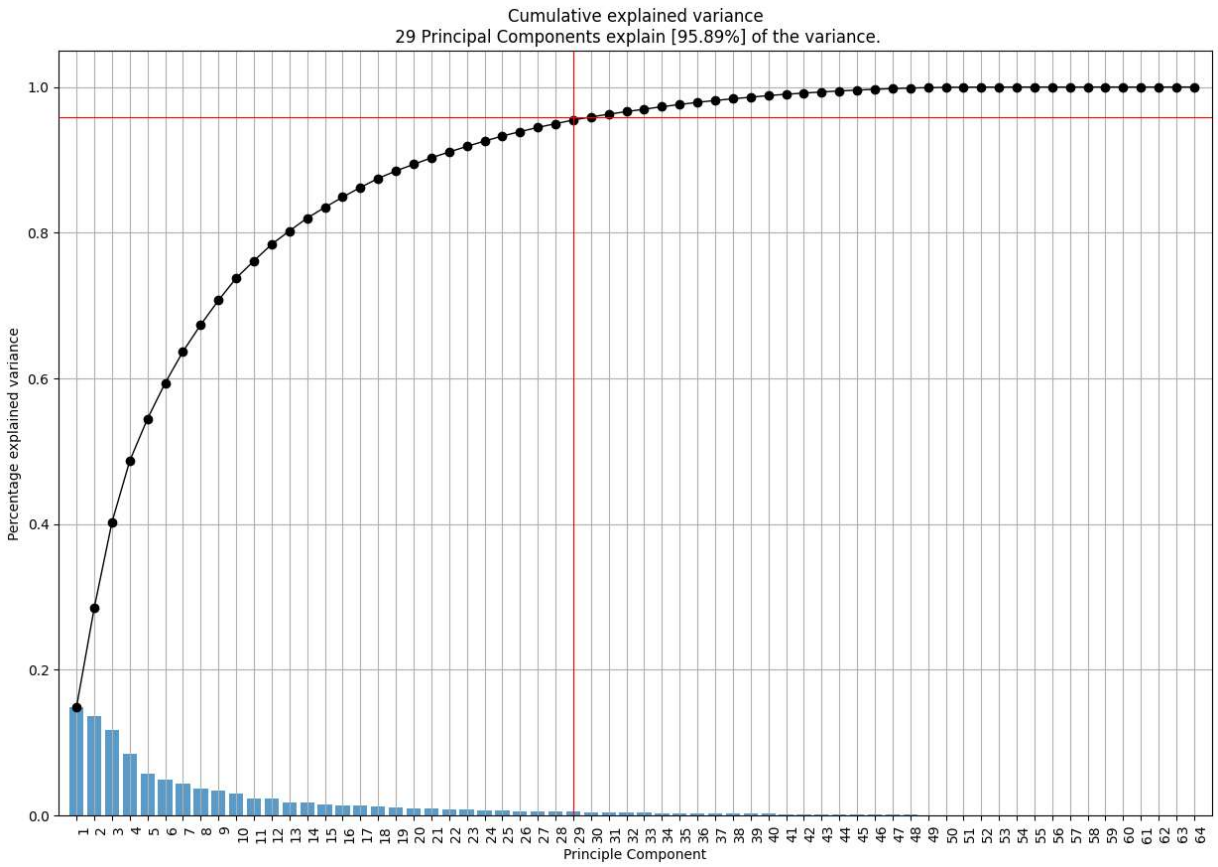


In [ ]:
```
cl.plot(cmap='binary', labels=[1,2])
```

Images in cluster 1

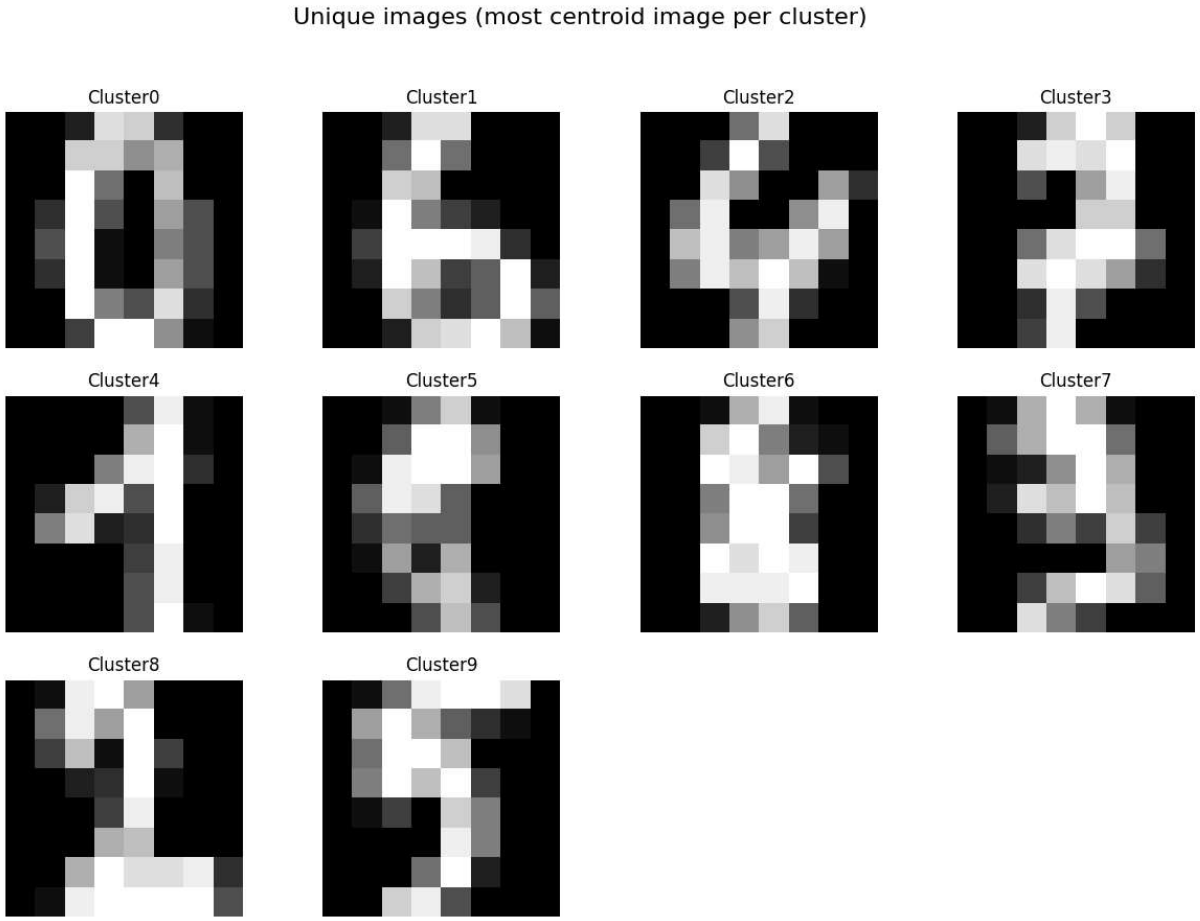


In [ ]:
```
cl.pca.plot()
```



Out[ ]:
```
(<Figure size 1500x1000 with 1 Axes>,
 <AxesSubplot:title={'center':'Cumulative explained variance\n 29 Principal Compon
ents explain [95.89%] of the variance.'}, xlabel='Principle Component', ylabel='Pe
rcentage explained variance'>)
<Figure size 640x480 with 0 Axes>
```

In [ ]:
```
cl.plot_unique(img_mean=False)
```



In [ ]: