Looking Beyond Activity Labels: Mining Context-Aware Resource Profiles using Activity Instance Archetypes (Demonstration)

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Attribute	Description
Phase	The phase within the process. Derived from the "concept.name" attribute, where the first digit of the last part expresses a phase within the process. A total of nine phases are present: Phase $0-8$
Resource	he unique identifier of the resource who executed this activity instance, e.g. "560462"
Case Procedure	Either blank (no value), "Regulier" (regular), or "Uitgebreid" (comprehensive)
Case Status	Either "G" or "O". We filtered out "T", because this only applied to two cases across all logs
Weekday	Number indicating the day of the week, starting with "1" for Monday. Derived from the timestamp indicating when the activity was completed
Case Parts	The category/ies the application relates to. Derived from the "(case) parts" attribute and transformed into dummy variables. An activity instance applies to at least one category, but multiple categories could be applicable. Some categories were aggregated to limit the number of variables, e.g. everything related to environment was bundled into one dummy. A total of fourteen categories are present, although not every municipality dealt with all categories: "Aanleg" (installation), "Bouw" (construction), "Brandveilig" (fireproof), "Flora en fauna" (flora and fauna), "Gebiedsbescherming" (area protection), "Handelen in strijd met regels RO" (acting in violation of spatial planning rules), "Inrit/uitweg" (entrance/exit), "Integraal" (integral), "Kap" (tree felling), "Milieu" (environment), "Monument" (monument), "Reclame" (advertisement), "Roerende zaken" (movable property), and "Sloop" (demolition)

Amount of clusters: where the BIC bends (no significant improvement anymore) and no cluster should be smaller than 5%

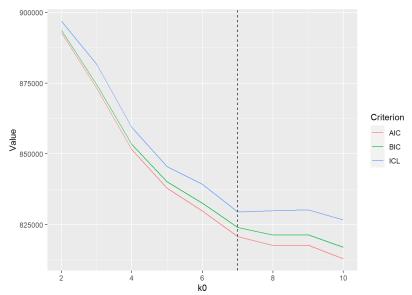
Activity instance archetypes:

- Phase: add until 70%
- Weekday: Monday+Thursday+Friday = "beginning/end of week", Tuesday+Wednesday = "midweek", Saturday+Sunday = "weekend"

Specialism:

- Either 1 or two activity instance archetypes (>70%, rest < 10%) + at least one group with 50%
- All resources in 1 clusters should satisfy

7 clusters:



```
Phase Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7
## 1 phase0 50.89% 31.43% 88.27% 18.89% 35.47% 28.19% 35.56%
## 2 phase1 12.64% 11.87% 11.35% 2.95% 19.5% 11.62% 18.91%
  3 phase2 4.23%
                  6.03%
                             0% 1.62% 11.61% 7.65% 10.66%
                                1.44% 13.04% 8.86%
  4 phase3 4.12%
                      7%
                             0%
                                                       9.2%
  5 phase4 13.83% 17.22%
                             0% 25.73% 18.97% 25.59% 14.83%
                         0.02% 46.04%
   6 phase5 7.72% 15.19%
                                       1.19% <mark>16.28%</mark> 10.23%
## 7 phase6 0.79%
                             0 응
                                 0.05% 0.05% 0.08%
                      0 응
  8 phase7 1.82% 3.45% 0.11% 0.93% 0.08%
                                                     0.52%
                                                0.4%
## 9 phase8 3.95% 7.81% 0.25% 2.34% 0.09% 1.33% 0.09%
```

```
## CaseStatus X1 X2 X3 X4 X5 X6 X7

## 1 G 81.21% 89.13% 47.62% 48.29% 50.68% 26.86% 85.43%

## 2 O 18.79% 10.87% 52.38% 51.71% 49.32% 73.14% 14.57%
```

```
## Weekday Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7

## 1 Begin/end of week 79.79% 89.76% 86.34% 43.30% 59.13% 51.58% 48.45%

## 2 Midweek 20.13% 10.21% 13.20% 56.67% 40.83% 48.42% 51.54%

## 3 Weekend 0.08% 0.02% 0.46% 0.03% 0.04% 0.00% 0.02%
```

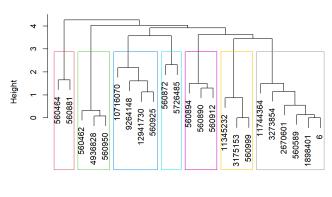
##	CasePart	X1	X2	Х3	X4	X5	X6	X7
## 1	Aanleg	0.00%	1.65%	5.60%	0.39%	0.50%	28.96%	0.00%
## 2	Bouw	21.24%	0.00%	83.70%	100.00%	100.00%	17.49%	16.38%
## 3	Brandveilig	0.74%	0.00%	2.96%	2.12%	0.40%	13.12%	0.00%
## 4	FloraFauna	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
## 5	Gebiedsbescherming	4.81%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
## 6	HandelenInStrijd	5.40%	0.00%	15.43%	8.43%	7.81%	45.98%	0.49%
## 7	Kap	0.24%	100.00%	1.17%	1.24%	0.47%	3.72%	3.18%
## 8	InritUitweg	0.00%	0.00%	1.54%	0.77%	0.76%	4.95%	0.00%
## 9	Milieu	100.00%	0.00%	6.04%	5.76%	6.38%	0.84%	0.00%
## 10	Monument	0.00%	0.00%	4.41%	9.17%	3.91%	3.97%	6.99%
## 11	Reclame	0.00%	0.00%	1.77%	1.10%	0.85%	6.57%	0.00%
## 12	Sloop	0.30%	0.00%	4.16%	4.39%	3.04%	0.01%	98.42%

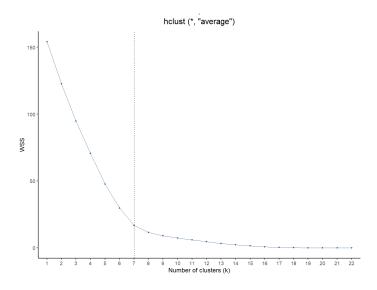
Activity instance archetypes:

Clust	Label	Description	Size (%)
1	Environment	Mainly occur at the beginning/end of the week, more likely	8.97%
	cases	require a comprehensive procedure, with typically a "G"	
		case status	
2	Tree felling cases	Mainly occur at the beginning/end of the week, always have	7.83%
		a "blank" procedure, with typically status "G"	
3	Construction	Mainly occur at the beginning/end of the week, typically	17.95%
	cases in phase 0	have a "blank" procedure, and are evenly split between	
		status "G" and "O"	
4	Construction	Occur evenly across the week, typically have a "blank"	17.77%
	cases in phase 4,5	procedure, and are evenly split between status "G" and "O"	
5	Other	Occur evenly across the week, typically have a "blank"	34.19%
	construction	procedure, and are evenly split between status "G" and "O"	
	cases		
6	Other cases	Occur evenly across the week, typically have a "blank"	8.09%
		procedure with status "O"	
7	Demolition cases	Occur evenly across the week, typically have a "blank"	5.20%
		procedure with status "G"	

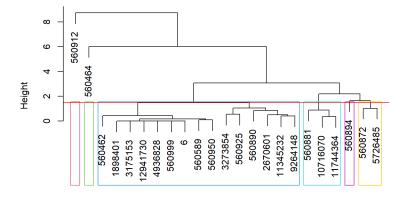
Profiles:



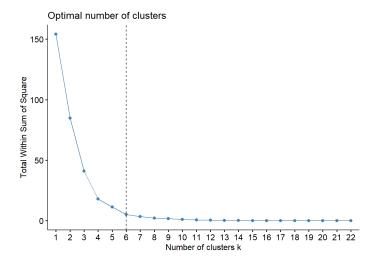




##		Resource	Clust1	Clust2	Clust3	Clust4	Clust5	Clust6	Clust7	Archetype
##	1	10716070	0.00%	0.00%	63.72%	35.85%	0.42%	0.00%	0.00%	3
##	2	12941730	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	3
##	3	560925	3.93%	6.26%	81.64%	0.05%	0.12%	0.00%	8.00%	3
##	4	9264148	2.22%	16.91%	80.87%	0.00%	0.00%	0.00%	0.00%	3
##	5	11345232	0.00%	0.00%	20.00%	0.00%	0.00%	80.00%	0.00%	6
##	6	3175153	0.00%	0.00%	0.03%	0.00%	0.00%	99.97%	0.00%	6
##	7	560999	0.00%	0.00%	0.00%	0.00%	0.00%	99.99%	0.00%	6
##	8	11744364	0.00%	0.00%	0.00%	0.00%	59.59%	40.41%	0.00%	5
##	9	1898401	0.00%	0.00%	0.03%	0.00%	99.97%	0.00%	0.00%	5
##	10	2670601	0.10%	0.33%	0.09%	0.03%	85.21%	13.02%	1.22%	5
##	11	3273854	0.00%	0.00%	2.08%	0.01%	80.24%	5.43%	12.25%	5
##	12	560589	0.00%	0.00%	0.00%	2.59%	97.40%	0.00%	0.00%	5
##	13	6	0.00%	0.00%	0.01%	0.00%	99.99%	0.00%	0.00%	5
##	14	4936828	99.99%	0.00%	0.01%	0.00%	0.00%	0.00%	0.00%	1
##	15	560462	94.98%	2.72%	2.30%	0.00%	0.00%	0.00%	0.00%	1
##	16	560950	98.53%	0.00%	0.00%	1.47%	0.00%	0.00%	0.00%	1
##	17	560464	0.00%	0.00%	20.20%	22.57%	22.68%	0.00%	34.56%	7,5
##	18	560881	0.29%	0.54%	0.37%	0.00%	<mark>53.19%</mark>	2.29%	43.31%	7,5
##	19	560872	18.03%	29.06%	50.86%	0.00%	0.00%	0.00%	2.05%	2,3,5
##	20	5726485	0.00%	34.17%	0.00%	12.54%	<mark>53.29%</mark>	0.00%	0.00%	2,3,5
##	21	560890	0.17%	0.00%	0.00%	75.95%	0.00%	17.83%	6.06%	4,6
##	22	560894	0.00%	0.00%	4.77%	44.31%	0.00%	42.38%	8.54%	4,6
##	23	560912	5.16%	2.94%	18.62%	54.00%	4.71%	12.50%	2.08%	4,6



hclust (*, "average")

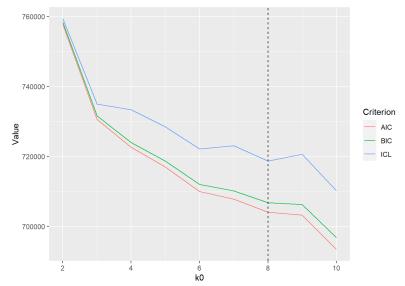


```
Resource Clust1 Clust2 Clust3 Clust4 Clust5 Clust6 Clust7 Specialism
##
    1 12941730 <mark>100.00%</mark> 0.00%
                                 0.00%
                                         0.00%
                                                 0.00%
                                                          0.00%
                                                                 0.00%
    2 560999
                          0.00%
##
                 99.99%
                                 0.00%
                                         0.00%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                 99.99%
    3 6
                          0.01%
                                 0.00%
                                         0.00%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                                                                         1
##
##
    4 4936828
                99.99%
                          0.01%
                                 0.00%
                                         0.00%
                                                 0.00%
                                                          0.00%
                                                                 0.00%
                                                                         1
    5 1898401
                          0.03%
                                  0.00%
                                         0.00%
                                                 0.00%
                                                                 0.00%
                                                          0.00%
    6 3175153
                99.97%
                          0.03%
                                 0.00%
                                         0.00%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                                                                         1
##
    7 560950
                 98.53%
##
                          1.47%
                                 0.00%
                                         0.00%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                                                                         1
    8 560589
                 97.40%
                          2.59%
                                 0.00%
                                         0.00%
                                                 0.00%
                                                          0.00%
                                                                 0.00%
    9 560462
                 94.98%
                          2.72%
                                 2.30%
                                         0.00%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                                                                         1
   10 2670601
                85.21%
                          13.02% 1.22%
                                         0.33%
                                                 0.10%
                                                         0.09%
                                                                 0.03%
                                                                         1
   11 560925
                 81.64%
                          8.00%
                                  6.26%
                                         3.93%
                                                 0.12%
                                                          0.05%
                                                                 0.00%
   12 9264148
                80.87%
                          16.91% 2.22%
                                         0.00%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                                                                         1
                80.24%
   13 3273854
                          12.25% 5.43%
                                         2.08%
                                                 0.01%
                                                         0.00%
                                                                 0.00%
                                                                         1
   14 11345232 80.00%
                          20.00% 0.00%
                                         0.00%
                                                 0.00%
                                                          0.00%
                                                                 0.00%
                                                                         1
   15 560890
                 75.95%
                          17.83% 6.06%
                                         0.17%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                                                                         1
   16 10716070 <mark>63.72</mark>%
                          35.85% 0.42%
                                         0.00%
                                                 0.00%
                                                          0.00%
                                                                 0.00%
                                                                         2
   17 11744364 <mark>59.59% 40.41%</mark> 0.00%
                                                 0.00%
                                         0.00%
                                                          0.00%
                                                                 0.00%
                                                                         2
   18 560881
                 53.19%
                         43.31% 2.29%
                                         0.54%
                                                 0.37%
                                                          0.29%
                                                                 0.00%
                                                                         2
   19 5726485
                53.29%
                          34.17% 12.54% 0.00%
                                                 0.00%
                                                          0.00%
                                                                 0.00%
                                                                         3
   20 560872
                 50.86%
                          29.06% 18.03% 2.05%
                                                 0.00%
                                                                         3
                                                          0.00%
                                                                 0.00%
   21 560912
                 54.00%
                          18.62% 12.50% 5.16%
                                                 4.71%
                                                          2.94%
                                                                 2.08%
                                                                         4
   22 560894
                 44.31%
                          42.38% 8.54%
                                         4.77%
                                                 0.00%
                                                         0.00%
                                                                 0.00%
                                                                         5
## 23 560464
                          22.68% 22.57% 20.20% 0.00%
                 34.56%
                                                         0.00%
                                                                 0.00%
                                                                         6
```

Specialists: cluster 1+2 (18)

##		Profile	Archetypes	`1`	`2`	`3`	`4`	`5`	`6`
##	1	1	3	3	1	0	0	0	0
##	2	2	6	3	0	0	0	0	0
##	3	3	5	5	1	0	0	0	0
##	4	4	1	3	0	0	0	0	0
##	5	5	7,5	0	1	0	0	0	1
##	6	6	2,3,5	0	0	2	0	0	0
##	7	7	4,6	1	0	0	1	1	0

8 clusters:



```
Phase Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7 Comp.8
## 1 phase0 45.81% 49.17% 39.29% 33.25% 46.88% 32.33% 37.35% 31.48%
## 2 phase1 11.22% 12.21% 14.41% 15.97% 11.34%
                                              8.98%
                                                    8.59%
                                                            8.75%
  3 phase2 3.65% 4.65%
                          7.3% 12.73% 5.04%
                                              6.51%
                                                     4.23% 6.38%
  4 phase3 3.82% 3.95% 5.98% 12.52%
                                       4.43%
                                              6.56%
## 5 phase4 11.62% 14.15%
                            13% 21.94% 17.2% 16.06% 15.72% 18.57%
  6 phase5 15.31% 7.89% 13.77%
                                2.39%
                                       6.89% <mark>16.98%</mark>
## 7 phase6 0.22%
                    1.2% 0.01% 0.02%
                                              0.03%
                                                     0.11% 0.06%
## 8 phase7 2.45% 2.86% 2.17%
                                0.4% 2.32%
                                              4.62%
                                                    3.33% 3.77%
## 9 phase8
            5.9% 3.92% 4.06% 0.78% 3.91% 7.93%
                                                     8.5% 7.97%
```

```
## CaseStatus X1 X2 X3 X4 X5 X6 X7 X8

## 1 G 94.79% 90.16% 90.56% 79.79% 88.68% 99.26% 89.02% 99.73%

## 2 O 5.21% 9.84% 9.44% 20.21% 11.32% 0.74% 10.98% 0.27%
```

```
## Weekday Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7 Comp.8
## 1 Begin/end of week 54.25% 56.38% 57.84% 39.44% 45.27% 47.95% 54.54% 46.70%
## 2 Midweek 45.45% 43.62% 41.94% 60.51% 54.69% 51.97% 45.20% 53.25%
## 3 Weekend 0.30% 0.00% 0.23% 0.05% 0.03% 0.08% 0.26% 0.05%
```

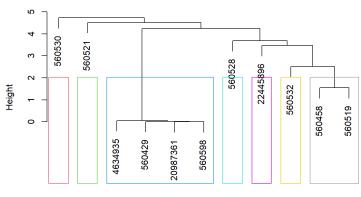
##	CasePart	X1	X2	Х3	X4	X5	Х6	X7	X8
## 1	Aanleg	0%	0.92%	14.14%	3.17%	0.76%	0.21%	4.42%	5.75%
## 2	Bouw	100%	19.06%	4.24%	95.87%	72.24%	100%	43.1%	2.16%
## 3	Brandveilig	0.59%	0%	2.29%	0.57%	23.02%	0.18%	0%	1.04%
## 4	Gebiedsbescherming	0%	6.18%	0%	0%	0%	0%	0%	0%
## 5	HandelenInStrijd	6.83%	3.64%	0%	18.25%	42.66%	4.18%	100%	0%
## 6	Kap	0%	0%	41.5%	0.54%	0%	0%	0%	54.14%
## 7	InritUitweg	1.35%	0.13%	7.03%	5.71%	0.98%	1.19%	0.05%	28.79%
## 8	Milieu	6.04%	100%	0%	3.85%	22.39%	5.92%	0%	0.55%
## 9	Monument	0.18%	0%	0%	0%	3.04%	0%	0%	0%
## 1	0 Reclame	0.45%	0%	1.23%	3.15%	0%	1.31%	0%	0%
## 1	1 Sloop	3.92%	1.03%	37.43%	0%	0%	5.05%	0%	13.09%

Activity instance archetypes:

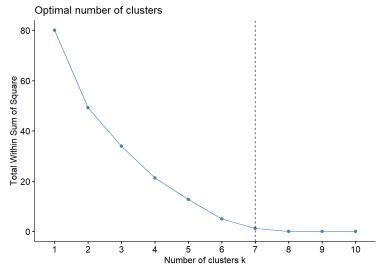
Clust	Label	Description	Size (%)
1	Construction	Blank case procedure, status G, spread over week, not	18.95%
	cases in phase	Thursday	
	0,4,5		
2	Environment	Comprehensive procedure, status G, spread over week	16.21%
	cases		
3	Tree felling and	Blank procedure, status G, spread over week	8.52%
	demolition cases		
4	Construction	Blank procedure, status G, spread over week, not Friday	8.86%
	cases in phase		
	0,1,4		
5	Construction	Comprehensive procedure, status G, spread over week, not	7.44%
	comprehensive	Friday	
	cases		
6	Construction	Blank procedure, status G, Tuesday and Thursday	16.72%
	cases in phase		
	0,1,4,5		
7	Act in violation of	Blank procedure, status G, spread over week	6.75%
	spatial planning		
	cases		
8	Other cases	Blank procedure, status G, Tuesday and Thursday	16.55%

Profiles:

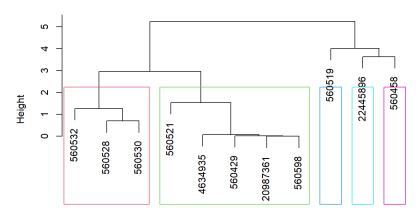




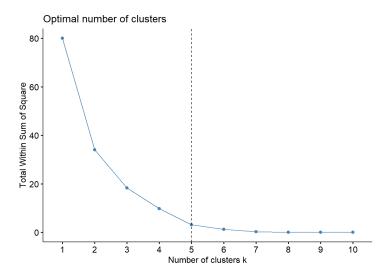
hclust (*, "average")



```
Resource Clust1 Clust2 Clust3 Clust4 Clust5 Clust6 Clust7 Clust8 Archetype
      20987361 0.00% 99.97%
                                0.00%
                                        0.00%
                                               0.00%
                                                       0.00%
                                                               0.02%
       4634935
                                0.00%
                                        0.00%
                                                0.00%
                                                        1.00%
                                                               0.00%
                                                                       0.00%
                                                                                  2
        560429
                 0.00% 99.62%
                                0.00%
                                        0.05%
                                                0.00%
                                                                                  2
                                                        0.27%
                                                               0.03%
                                                                       0.03%
                                0.00%
                                        0.01%
                                                0.00%
                                                        0.03%
                                                                                  2
                                                0.00% 22.44%
                                                                                  3,4,6,7
                                        0.00% 10.80% 13.37%
                                                                                  1,2,3,5,6
                        1.75% <mark>10.12% 16.89%</mark>
                                                9.31% 21.56%
                                                                                  1,3,4,6,7
                1.09%
                        0.63% 6.03% <mark>75.89%</mark> 11.50%
                        0.00% 11.35%
                                        0.03%
        560528 <mark>28.96%</mark>
                                                0.00% 59.61%
                                                                0.02%
                                                                                  1,6
        560530 0.00%
                       0.57% 0.00%
                                        0.00%
                                                8.39% 33.46%
                                                                                  6,8
        560532 <mark>39.70% 37.56%</mark> 13.15% 2.73%
                                               1.36% 0.00%
                                                               5.51% 0.00%
## 11
                                                                                  1,2
```



hclust (*, "average")

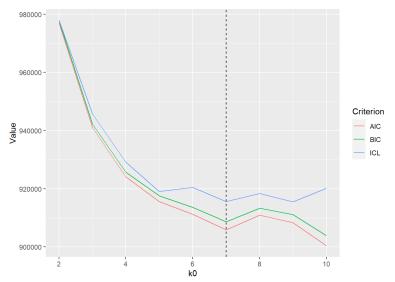


```
Resource Clust1 Clust2 Clust3 Clust4 Clust5 Clust6 Clust7 Clust8 Specialism
##
   1 20987361 99.97% 0.02% 0.01% 0.00% 0.00%
##
                                                 0.00%
                                                         0.00%
                                                                0.00%
   2 560598
               99.96% 0.03%
                            0.01%
                                    0.00%
                                           0.00%
                                                  0.00%
                                                         0.00%
                                                                0.00%
   3 560429
              99.62% 0.27%
                             0.05%
                                    0.03%
                                           0.03%
                                                 0.00%
                                                         0.00%
                                                                0.00%
   4 4634935
              <mark>98.77%</mark> 1.00%
                            0.22%
                                    0.00%
                                           0.00%
                                                  0.00%
                                                         0.00%
                                                                0.00%
              75.89% 11.50% 6.03%
   5 560521
                                    2.98%
                                           1.88%
                                                  1.09%
                                                         0.63%
                                                                0.00%
    6 22445896 28.51% 22.44% 19.99% 19.24% 6.95%
                                                  1.62%
                                                         1.24%
                                                                0.00%
   7 560458
              29.26% 16.08% 14.38% 13.37% 10.80% 8.54%
                                                         7.58%
                                                                0.00%
                                                                       3
              22.77% 21.56% 16.89% 13.84% 10.12% 9.31%
   8 560519
                                                         3.76%
                                                                1.75%
                                                                        4
              59.61% 28.96% 11.35% 0.03% 0.02%
    9 560528
                                                 0.02%
                                                         0.00%
  10 560530
              54.52% 33.46% 8.39% 3.07% 0.57%
                                                 0.00%
                                                         0.00%
                                                                0.00%
                                                                        5
              39.70% 37.56% 13.15% 5.51% 2.73% 1.36%
## 11 560532
                                                         0.00%
                                                                0.00%
```

Specialists: cluster 1 (5)

##		Profile	Archetypes	`1`	`2`	`3`	`4`	`5`
##	1	1	2	4	0	0	0	0
##	2	2	3,4,6,7	0	1	0	0	0
##	3	3	1,2,3,5,6	0	0	1	1	0
##	4	4	1,3,4,6,7	1	0	0	0	0
##	5	5	4	0	0	0	0	1
##	6	6	1,6	0	0	0	0	1
##	7	7	1,2	0	0	0	0	1

7 clusters:



```
Phase Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7
## 1 phase0 51.91% 43.83% 43.85% 37.89% 48.75% 44.13% 38.48%
## 2 phase1 12.24% 16.96%
                           0% 11.57% 11.3% <mark>14.4%</mark> 12.15%
  3 phase2 4.64% 10.16% 0.01% 7.31% 6.54%
                                              8.89%
## 4 phase3 4.97% 11.87% 0.07% 8.57%
                                      7.1%
                                              8.82% 8.77%
  5 phase4 16.4% 16.3% 18.63% 20.15% 22.41% 16.85% 19.03%
                                        3.2% 6.18% 13.28%
  6 phase5 7.67% 0.41% 37.03% 14.28%
## 7 phase6 0.33% 0.05% 0.02% 0.02% 0.02% 0.03%
## 8 phase7
            0.9% 0.12% 0.04% 0.16% 0.22% 0.19%
                                                       0%
## 9 phase8 0.94%
                    0.3% 0.34% 0.04% 0.47% 0.51%
```

```
## CaseStatus X1 X2 X3 X4 X5 X6 X7

## 1 G 87.6% 97.36% 97.96% 98.28% 91.42% 93.99% 98.7%

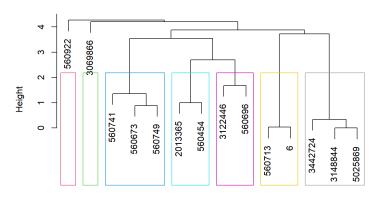
## 2 O 12.4% 2.64% 2.04% 1.72% 8.58% 6.01% 1.3%
```

##	Weekday	Comp.1	Comp.2	Comp.3	Comp.4	Comp.5	Comp.6	Comp.7
## 1	Begin/end of week	51.12%	47.79%	54.22%	49.37%	57.19%	49.80%	59.77%
## 2	2 Midweek	47.94%	51.46%	44.08%	49.68%	42.50%	48.90%	39.07%
## 3	Weekend	0.94%	0.76%	1.70%	0.95%	0.31%	1.31%	1.16%

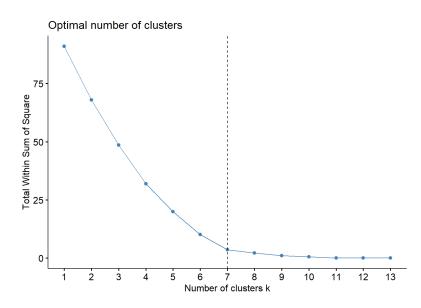
##		CasePart	X1	X2	Х3	X4	X5	Х6	X7
##	1	Aanleg	0%	0.36%	0.54%	1.57%	7.06%	3.28%	9.17%
##	2	Bouw	18.81%	100%	<mark>93.52%</mark>	0%	58.06%	11.74%	0.72%
##	3	Brandveilig	0%	0%	0.53%	0%	0%	32.98%	0%
##	4	FloraFauna	1.89%	0%	0%	0%	0%	0%	0%
##	5	Gebiedsbescherming	6.52%	0%	0%	0%	0%	0%	0%
##	6	HandelenInStrijd	1.89%	10.19%	14.85%	0.36%	99.48%	0%	0%
##	7	Kap	0%	2.09%	1.61%	100%	0.16%	1.81%	4.42%
##	8	InritUitweg	0%	5.74%	5.49%	0%	8.5%	0%	79.29%
##	9	Milieu	93.38%	1.32%	0.98%	0%	3.14%	0%	0%
##	10	Monument	0%	1.49%	1.57%	0%	0%	0%	0%
##	11	Reclame	0%	3.96%	4.43%	0%	3.53%	7.52%	0%
##	12	Roerende Zaken	0%	0%	0%	0%	0.34%	0%	0%
##	13	Sloop	2.39%	8.31%	5.62%	0.02%	0.41%	45.4%	0%

Clust	Label	Description	Size (%)
1	Environment	Comprehensive procedure + sometimes blank, status G, spread	8.23%
	cases	over week	
2	Construction	Blank procedure, status G, spread over week, not Friday	36.70%
	cases in phase		
	0,1,4		
3	Construction	Blank procedure, status G, spread over week	18.69%
	cases in phase		
	0,5		
4	Tree felling	Blank procedure, status G, spread over week, not Friday	18.60%
	cases		
5	Act in violation	Blank procedure, + sometimes comprehensive, status G,	5.87%
	of spatial	spread over week	
	planning cases		
6	Other cases	Blank procedure, status G, spread over week, not Friday	5.58%
7	Entrance/exit	Blank procedure, status G, spread over week	6.34%
	cases		

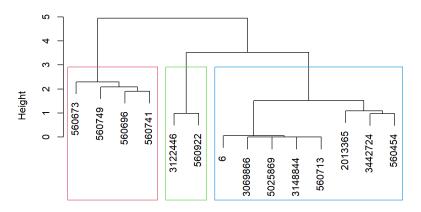
Profiles:

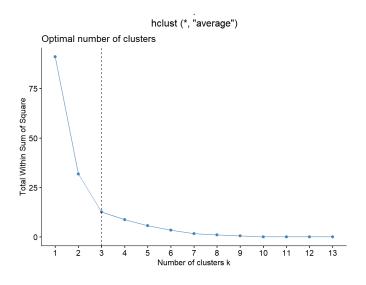


hclust (*, "average")



##		Resource	Clust1	Clust2	Clust3	Clust4	Clust5	Clust6	Clust7	Archetypes
##	1	2013365	0.00%	78.43%	0.26%	1.78%	8.23%	7.55%	3.76%	2,6
##	2	560454	0.00%	80.32%	0.00%	0.07%	6.98%	11.05%	1.58%	2,6
##	3	3069866	0.00%	0.00%	0.00%	99.99%	0.00%	0.00%	0.00%	4
##	4	3122446	0.00%	<mark>58.67%</mark>	0.15%	0.00%	21.48%	0.00%	<mark>19.70</mark> %	2,4,5,7
##	5	560696	0.73%	42.36%	1.57%	27.72%	13.91%	3.50%	10.21%	2,4,5,7
##	6	3148844	99.99%	0.01%	0.00%	0.00%	0.00%	0.00%	0.00%	1
##	7	3442724	89.59%	3.46%	3.13%	0.28%	2.95%	0.00%	0.58%	1
##	8	5025869	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1
##	9	560673	2.11%	0.98%	42.06%	40.24%	2.52%	4.85%	7.23%	3,4
##	10	560741	2.84%	0.82%	53.12%	19.60%	7.44%	5.64%	10.54%	3,4
##	11	560749	10.22%	1.41%	28.59%	42.15%	3.80%	3.57%	10.25%	3,4
##	12	560713	0.00%	0.00%	0.00%	0.00%	99.99%	0.00%	0.00%	5
##	13	6	0.02%	0.74%	0.00%	0.00%	99.22%	0.00%	0.01%	5
##	14	560922	32.73%	0.00%	0.00%	21.84%	0.00%	0.00%	<mark>45.43</mark> %	1,4,7



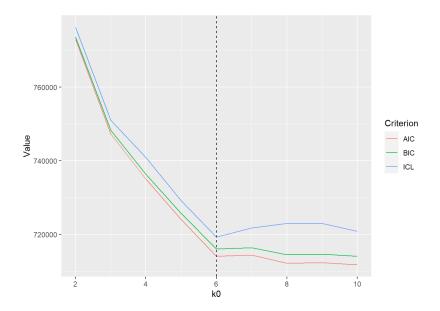


```
Resource Clust1 Clust2 Clust3 Clust4 Clust5 Clust6 Clust7 Specialism
##
  1 5025869 100.00% 0.00% 0.00% 0.00% 0.00% 0.00% 1
## 2 3069866 99.99% 0.00% 0.00% 0.00% 0.00% 0.00% 1
   3 560713
            99.99% 0.00% 0.00% 0.00% 0.00% 0.00% 1
   4 3148844 99.99% 0.01% 0.00% 0.00% 0.00% 0.00% 1
            99.22% 0.74% 0.02% 0.01% 0.00% 0.00% 0.00% 1
  6 3442724 <mark>89.59%</mark> 3.46% 3.13% 2.95% 0.58% 0.28% 0.00% 1
##
  7 560454
            80.32% 11.05% 6.98% 1.58% 0.07% 0.00% 0.00% 1
##
  8 2013365 <mark>78.43%</mark> 8.23% 7.55% 3.76% 1.78% 0.26% 0.00% 1
  9 3122446 58.67% 21.48% 19.70% 0.15% 0.00% 0.00% 0.00% 2
## 10 560922 45.43% 32.73% 21.84% 0.00% 0.00% 0.00% 0.00% 2
## 11 560741 53.12% 19.60% 10.54% 7.44% 5.64% 2.84% 0.82% 3
## 12 560696 42.36% 27.72% 13.91% 10.21% 3.50% 1.57% 0.73% 3
## 13 560749 42.15% 28.59% 10.25% 10.22% 3.80% 3.57% 1.41% 3
```

Specialists: cluster 1 (8)

```
Profile Archetypes `1`
                                    `3`
                              `2`
             2,6
                         2
## 1 1
                               0
                                     0
             4
## 2 2
                         1
                               0
                                     0
## 3 3
            2,4,5,7
                         0
                               1
                                     1
            1
                         3
## 4 4
                               0
                                     0
## 5 5
            3,4
                         0
                               0
                                     3
## 6 6
            5
                         2
                                     0
                               0
## 7 7
           1,4,7
                        0
                               1
                                     0
```

6 clusters:



```
## Cluster n rel

## 1 1 2747 0.05808471

## 2 2 3933 0.08316241

## 3 3 6781 0.14338274

## 4 4 15771 0.33347430

## 5 5 5715 0.12084241

## 6 6 12346 0.26105343
```

```
## Phase Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6

## 1 phase0 36.92% 52.87% 34.71% 49.35% 41.44% 30.4%

## 2 phase1 16.53% 10.09% 9.86% 7.07% 9.29% 17.63%

## 3 phase2 10.54% 4.44% 6.75% 0.3% 5.57% 13.97%

## 4 phase3 8.7% 4.48% 7.91% 0.01% 6.76% 16.02%

## 5 phase4 14.52% 16.08% 19.18% 12.78% 18.74% 21.69%

## 6 phase5 12.43% 7.82% 16.54% 24.11% 13.8% 0%

## 7 phase6 0.04% 1.04% 0.04% 0.14% 0.23% 0.01%

## 8 phase7 0.26% 1.5% 2.85% 3.36% 1.97% 0.03%

## 9 phase8 0.08% 1.68% 2.15% 2.87% 2.2% 0.26%
```

```
## CaseStatus X1 X2 X3 X4 X5 X6

## 1 G 71.32 47.94 94.12 45.52 25.72 43.66 43.66 45 47.94 52.06 5.88 54.48 74.28 56.34
```

```
## Weekday Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6

## 1 Begin/end of week 53.57% 55.41% 50.58% 55.04% 55.42% 50.14%

## 2 Midweek 46.43% 44.34% 49.32% 44.78% 44.44% 49.85%

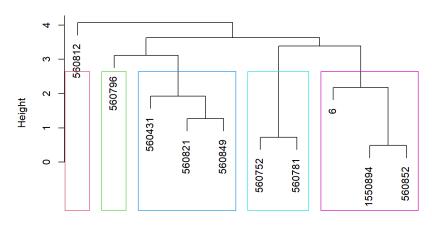
## 3 Weekend 0.00% 0.25% 0.10% 0.18% 0.14% 0.01%
```

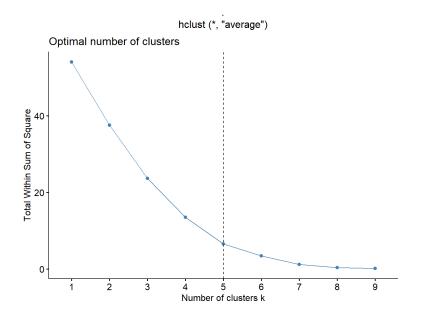
```
CasePart X1
                           X2
##
                                 хЗ
                                      X4
                                            X5 X6
## 1
             Aanleg
                      0%
                           0% 0.41% 0.41% 9.76% 0.42%
               Bouw 2.59% 27.28% 0.5% 99.95% 1.96%
                      0% 7.13%
                               0%
                                       0%
                                             0%
## 3
          Brandveilig
                                                 0%
## 4 Gebiedsbescherming 0% 3.49%
                               0%
                                      0%
                                             N&
                                                 0%
     HandelenInStrijd
                      0% 3.12%
                                0% 17.22% <mark>87.51%</mark> 16.66%
## 6
                Kap 0%
                           0% 100% 0.26% 0.44% 0.33%
         InritUitweg 10.81%
## 7
                           0% 0% 1.83%
                                            0% 1.33%
## 8
             Milieu 1.59% 86.21% 0% 1.98%
                                            0% 3.67%
## 9
           Monument 0% 1.37% 0% 2% 2.72% 2.44%
            Reclame 2.03% 0%
                                0% 0.4% 0% 0.42%
## 10
              Sloop 80.43% 2.85% 0% 2.82% 0.85% 3.78%
## 11
```

Clust	Label	Description	Size (%)
1	Demolition	Blank procedure, status G, spread over week	5.81%
	cases		
2	Environment	Comprehensive procedure, spread over week	8.32%
	cases		
3	Tree felling	Blank procedure, status G, spread over week	14.34%
	cases		
4	Construction	Blank procedure, spread over week	33.35%
	cases in phase		
	0,5		
5	Act in violation	Blank procedure, status O, spread over week	12.08%
	of spatial		
	planning cases		
6	Other	Blank procedure, spread over week	26.11%
	construction		
	cases		

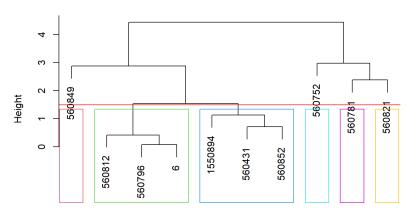
Profiles:

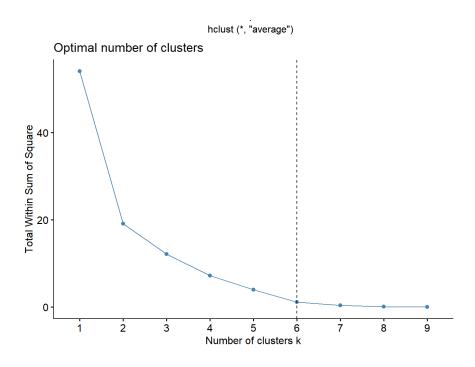






##		Resource	Clust1	Clust2	Clust3	Clust4	Clust5	Clust6	Archetypes
##	1	1550894	0.61%	2.12%	0.08%	6.02%	17.12%	74.05%	6
##	2	560852	0.00%	0.00%	0.00%	1.25%	14.68%	84.06%	6
##	3	6	0.00%	0.00%	0.00%	0.00%	1.09%	98.91%	6
##	4	560431	76.49%	0.00%	0.00%	0.00%	0.08%	23.43%	1,2
##	5	560821	<mark>35.60%</mark>	34.58%	4.63%	17.09%	4.26%	3.83%	1,2
##	6	560849	54.49%	45.50%	0.00%	0.00%	0.01%	0.00%	1,2
##	7	560752	4.96%	17.24%	13.39%	51.82%	11.16%	1.43%	3,4,5
##	8	560781	2.64%	2.06%	27.52%	53.14%	12.96%	1.68%	3,4,5
##	9	560796	0.00%	99.79%	0.00%	0.00%	0.21%	0.00%	2
##	10	560812	5.83%	0.00%	94.17%	0.00%	0.01%	0.00%	3



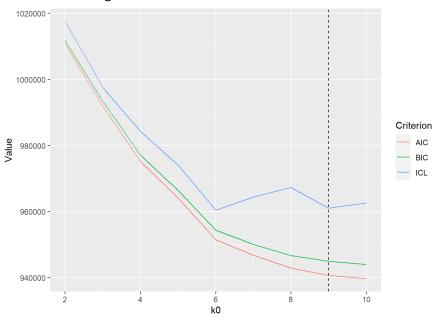


```
## Resource Clust1 Clust2 Clust3 Clust4 Clust5 Clust6 Specialism
## 1 560852 84.06% 14.68% 1.25% 0.00% 0.00% 0.00% 1
## 2 560431 76.49% 23.43% 0.08% 0.00% 0.00% 0.00% 1
## 3 1550894 74.05% 17.12% 6.02% 2.12% 0.61% 0.08% 1
## 4 560752 51.82% 17.24% 13.39% 11.16% 4.96% 1.43% 2
## 5 560781 53.14% 27.52% 12.96% 2.64% 2.06% 1.68% 3
## 6 560796 99.79% 0.21% 0.00% 0.00% 0.00% 4
## 7 6 98.91% 1.09% 0.00% 0.00% 0.00% 0.00% 4
## 8 560812 94.17% 5.83% 0.01% 0.00% 0.00% 0.00% 4
## 9 560821 35.60% 34.58% 17.09% 4.63% 4.26% 3.83% 5
## 10 560849 54.49% 45.50% 0.01% 0.00% 0.00% 0.00% 0.00% 6
```

Specialists: clusters 1+4+6 (7)

##		Profile	Archetypes	`1`	`2`	`3`	`4`	`5`	`6`
##	1	1	6	2	0	0	1	0	0
##	2	2	1,2	1	0	0	0	1	1
##	3	3	3,4,5	0	1	1	0	0	0
##	4	4	2	0	0	0	1	0	0
##	5	5	3	0	0	0	1	0	0

9 clusters => 10 clusters would go under 5% cluster size



```
## Cluster n rel

## 1 1 3519 0.05961477

## 2 2 3467 0.05873384

## 3 3 11151 0.18890715

## 4 4 3073 0.05205916

## 5 5 3946 0.06684850

## 6 6 21786 0.36907283

## 7 7 3330 0.05641295

## 8 8 5681 0.09624083

## 9 9 3076 0.05210998
```

```
Phase Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7 Comp.8 Comp.9
## 1 phase0 36.81% 34.39% 32.63% 44.28% 51.59% 31.97% 35.85% 70.98% 55.19%
## 2 phase1 25.93%
                       0%
                                                       0.29%
                                                              9.62%
  3 phase2 12.23%
                        0.25%
                               8.7%
                                    4.73% 11.85%
                    0%
                                                 6.75%
                                                               3.3%
  4 phase3 10.18% 0.01%
                         0.3% 10.05%
                                      4.7% 12.36%
                                                 7.06%
  5 phase4 12.8%
                 12.7%
                         5.23% 17.96%
  6 phase5
           0.78% <mark>34.32% 36.71</mark>%
                              1.87%
                                    5.95%
                                           0.21% 14.04%
                                                       10.3% 10.21%
  7 phase6
                 0.77%
                           0%
                              0.16%
                                    0.71%
                                           0.04%
                                                 0.17%
  8 phase7 0.37% 11.43%
                       3.53%
                              0.53% 1.85%
                                           0.35%
                                                 2.75%
                                                         6.8%
                                                             0.09%
## 9 phase8
            0.9% 6.38% 8.75% 1.87% 4.46% 2.71%
                                                 4.97% 6.25% 0.75%
```

```
## CaseStatus X1 X2 X3 X4 X5 X6 X7 X8 X9
## 1 G 100% 100% 94.76% 96.35% 89.39% 95.77% 90.44% 99.78% 39.35%
## 2 O 0% 0% 5.24% 3.65% 10.61% 4.23% 9.56% 0.22% 60.65%
```

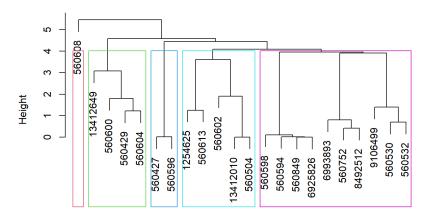
```
## Weekday Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7 Comp.8 Comp.9
          1 21.26% 14.4% 23.32% 20.73% 18.62% 19.13% 21% 12.92% 16.89%
## 1
          2 18.09% 25.42% 19.44% 24.44% 20.99% 19.94% 24.48% 38.37% 24.39%
## 2
         3 22.22% 30.38% 33.38% 20.45% 27.69% 26.09% 22.57% 3.66% 22.59%
         4 24.43% 21.23% 21.46% 19.63% 28.07% 20.46% 22.89% 20.11% 24.85%
## 4
         5 14% 8.4% 2.24% 14.72% 4.6% 14.37% 8.94% 24.65% 11.17%
## 5
              0% 0.13% 0.07% 0.03% 0.03%
                                              0% 0.06% 0.18% 0.01%
## 6
                                        0%
## 7
               0% 0.04% 0.09%
                                 0%
                                              0% 0.06% 0.11% 0.11%
```

```
## Weekday Comp.1 Comp.2 Comp.3 Comp.4 Comp.5 Comp.6 Comp.7 Comp.8 Comp.9
## 1 Begin/end of week 59.69% 44.02% 47.02% 55.07% 51.30% 53.96% 52.83% 57.67% 52.90%
## 2 Midweek 40.31% 55.80% 52.82% 44.89% 48.68% 46.04% 47.05% 42.03% 46.97%
## 3 Weekend 0.00% 0.17% 0.15% 0.03% 0.03% 0.00% 0.12% 0.29% 0.13%
```

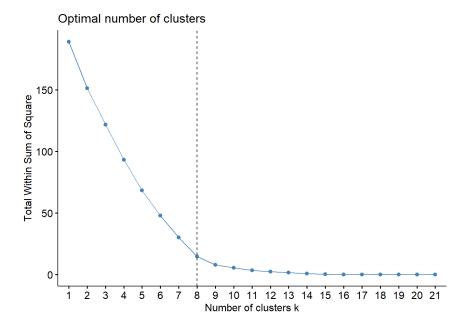
##		CasePart	X1	X2	хз	X4	X5	Х6	х7	X8	Х9
##	1	Aanleg	1.15%	9.77%	0%	25.3%	5.14%	0%	1.43%	0%	12.19%
##	2	Bouw	48.09%	43.13%	100%	0.57%	31.35%	100%	0%	100%	67.98%
##	3	Brandveilig	2.2%	7.04%	0%	24.93%	0.9%	0.43%	0%	0%	7.74%
##	4	FloraFauna	7.27%	0.89%	0%	0%	0%	0%	0%	0%	0%
##	5	Gebiedsbescherming	0.77%	0.32%	0%	0%	1.82%	0%	0%	0%	0%
##	6	HandelenInStrijd	15.62%	33.8%	14.03%	42.79%	15.02%	18.53%	0%	19.73%	61.95%
##	7	Kap	6.88%	4.27%	0.16%	0%	0.12%	0.45%	100%	0.49%	0.75%
##	8	InritUitweg	1%	2.53%	1.29%	3.1%	0%	1.53%	1.33%	1.23%	0%
##	9	Integraal	4.71%	0%	0%	0%	0%	0%	0%	0.2%	0%
##	10	Milieu	10.03%	8.12%	3.35%	0%	100%	5.24%	0%	6.76%	2.61%
##	11	Monument	5.58%	2.28%	2.47%	0%	0%	2.14%	0%	2.95%	1%
##	12	Reclame	0%	1.69%	1.52%	4.97%	0%	1.52%	0%	1.61%	5.85%
##	13	Roerende Zaken	0%	0%	0%	0%	0%	0%	0%	0%	1.06%
##	14	Sloop	87.17%	35.44%	0%	0%	2.94%	0%	0%	0.79%	0%

Clust	Label	Description	Size (%)
1	Demolition cases	Blank procedure, status G, spread over week	5.96%
2	Other cases in phase 0,5,7	Blank procedure, status G, spread over week, less likely Friday	5.87%
3	Construction cases in phase 0,5	Blank procedure, status G, spread over week, not Friday	18.89%
4	Other cases in phase 0,1,4	Blank procedure, status G, spread over week	5.21%
5	Environment cases	Comprehensive procedure, status G, spread over week, not Friday	6.68%
6	Construction cases in phase 0,1,4	Blank procedure, status G, spread over week	36.91%
7	Tree felling cases	Blank procedure, status G, spread over week, less likely Friday	5.64%
8	Construction cases in phase 0	Blank procedure, status G, spread over week, not Wednesday	9.62%
9	Other cases in phase 0,4	Blank procedure + sometimes comprehensive procedure, more likely status O, spread over week	5.21%

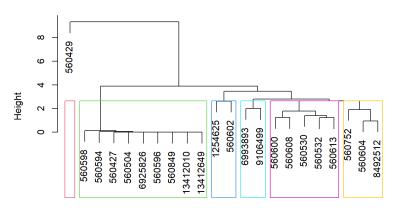
Profiles:



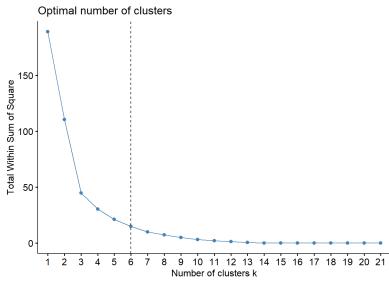
hclust (*, "average")



##	Re	esource	Clust1	Clust2	Clust3	Clust4	Clust5	Clust6	Clust7	Clust8	Clust9	Archetypes
##	1 1	1254625	1.18%	31.43%	38.23%	0.08%	5.50%	0.42%	6.00%	<mark>17.16%</mark>	0.00%	2,3,8
## :	2	560613	0.00%	39.58%	16.54%	0.00%	1.21%	0.94%	7.18%	34.56%	0.00%	2,3,8
##	3 13	3412010	0.01%	0.00%	99.98%	0.00%	0.00%	0.01%	0.00%	0.00%	0.00%	3
##	4	560504	0.03%	0.00%	99.92%	0.00%	0.00%	0.04%	0.00%	0.00%	0.00%	3
##	5	560602	0.04%	15.27%	63.50%	2.35%	5.46%	0.57%	5.13%	0.45%	7.24%	3
##	6 13	3412649	0.00%	0.00%	0.01%	0.00%	0.00%	99.99%	0.00%	0.00%	0.00%	6
##	7	560429	11.43%	2.84%	2.44%	2.45%	4.14%	52.49%	3.56%	11.80%	8.85%	6
##	8	560600	18.15%	0.03%	0.91%	4.74%	1.26%	60.66%	0.00%	14.26%	0.00%	6
##	9	560604	9.60%	0.00%	0.56%	2.93%	0.00%	81.94%	1.06%	0.19%	3.72%	6
##	10	560427	0.04%	0.00%	0.16%	0.00%	0.00%	0.00%	99.80%	0.00%	0.00%	7
##	11	560596	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	7
##	12	560530	2.42%	0.00%	28.25%	0.00%	7.65%	0.00%	12.19%	0.00%	49.49%	3,7,9
##	13	560532	0.00%	1.82%	32.60%	1.06%	0.00%	0.00%	9.02%	8.24%	47.26%	3,7,9
##	14 9	9106499	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	30.68%	18.47%	50.85%	3,7,9
##	15	560594	0.00%	0.00%	0.00%	0.00%	99.41%	0.59%	0.00%	0.00%	0.00%	5
##	16	560598	0.00%	0.00%	0.00%	0.00%	98.30%	0.00%	0.00%	0.00%	1.70%	5
##	17	560849	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	5
##	18 (5925826	0.00%	0.00%	0.01%	0.00%	99.99%	0.00%	0.00%	0.00%	0.00%	5
##	19	560608	0.00%	0.23%	0.00%	<mark>52.29%</mark>	0.00%	18.60%	5.56%	0.24%	23.09%	4,9
## :	20	560752	0.00%	1.94%	2.73%	8.90%	9.03%	0.00%	7.20%	70.20%	0.00%	8
## :	21 (5993893	0.00%	0.00%	0.00%	12.90%	0.00%	0.00%	0.00%	<mark>75.55%</mark>	11.55%	8
## :	22 8	3492512	0.84%	0.00%	0.00%	9.02%	5.72%	0.00%	5.08%	77.48%	1.86%	8







```
Resource Clust1 Clust2 Clust3 Clust4 Clust5 Clust6 Clust7 Clust8 Clust9 Specialism
##
              63.50% 15.27% 7.24% 5.46% 5.13% 2.35% 0.57% 0.45% 0.04% 1
##
   1 560602
   2 1254625 38.23% 31.43% 17.16% 6.00% 5.50% 1.18% 0.42% 0.08% 0.00% 1
             100.00% 0.00% 0.00% 0.00% 0.00%
   3 560596
                                               0.00% 0.00% 0.00% 0.00%
   4 560849
              100.00% 0.00%
                            0.00% 0.00%
                                         0.00%
                                                0.00%
                                                      0.00%
                                                             0.00%
             99.99%
                    0.01%
                            0.00%
                                  0.00%
                                         0.00%
   5 6925826
                                                0.00%
                                                      0.00%
                                                            0.00% 0.00%
   6 13412649 99.99%
                    0.01%
                            0.00%
                                  0.00%
                                         0.00%
                                                0.00%
                                                      0.00%
                                                            0.00% 0.00%
   7 13412010 99.98%
                    0.01%
                            0.01% 0.00%
                                         0.00%
                                                0.00%
                                                      0.00% 0.00% 0.00%
   8 560504
              99.92% 0.04% 0.03% 0.00% 0.00%
                                                0.00%
                                                      0.00% 0.00% 0.00%
   9 560427
             99.80% 0.16% 0.04% 0.00%
                                         0.00%
                                                0.00%
                                                      0.00% 0.00% 0.00%
## 10 560594
              99.41% 0.59% 0.00% 0.00%
                                         0.00%
                                                0.00%
                                                      0.00%
                                                            0.00% 0.00%
              98.30% 1.70% 0.00% 0.00%
## 11 560598
                                         0.00%
                                                0.00%
                                                      0.00%
                                                            0.00% 0.00%
## 12 560429
             52.49% 11.80% 11.43% 8.85%
                                                3.56%
                                                      2.84%
                                         4.14%
                                                             2.45%
                                                                   2.44%
## 13 560600
              60.66% 18.15% 14.26% 4.74%
                                         1.26%
                                                0.91%
                                                      0.03%
                                                            0.00% 0.00%
## 14 560608
              52.29% 23.09% 18.60% 5.56%
                                         0.24%
                                                0.23%
                                                      0.00%
                                                             0.00%
                                                                   0.00%
## 15 560530
              49.49% 28.25% 12.19% 7.65% 2.42%
                                                0.00%
                                                      0.00%
                                                             0.00%
## 16 560532
             47.26% 32.60% 9.02% 8.24%
                                         1.82%
                                                1.06%
                                                      0.00%
                                                             0.00%
## 17 560613
              39.58% 34.56% 16.54% 7.18% 1.21%
                                                0.94%
                                                      0.00%
                                                            0.00%
              81.94% 9.60% 3.72% 2.93% 1.06%
## 18 560604
                                                0.56%
                                                      0.19%
                                                            0.00%
                                                                   0.00%
## 19 8492512
             77.48% 9.02% 5.72% 5.08% 1.86%
                                                0.84%
                                                      0.00%
                                                            0.00% 0.00% 5
## 20 560752
              70.20% 9.03% 8.90% 7.20%
                                         2.73%
                                                      0.00%
                                                            0.00%
                                                                   0.00%
                                                1.94%
## 21 6993893
             75.55% 12.90% 11.55% 0.00% 0.00% 0.00%
                                                      0.00% 0.00% 0.00% 6
## 22 9106499 50.85% 30.68% 18.47% 0.00% 0.00%
                                               0.00%
                                                      0.00% 0.00% 0.00% 6
```

Specialists: clusters 2+5 (12)

##		Profile	Archetypes	`1`	`2`	`3`	`4`	`5`	`6`
##	1	1	2,3,8	1	0	0	1	0	0
##	2	2	3	1	2	0	0	0	0
##	3	3	6	0	1	1	1	1	0
##	4	4	7	0	2	0	0	0	0
##	5	5	3,7,9	0	0	0	2	0	1
##	6	6	5	0	4	0	0	0	0
##	7	7	4,9	0	0	0	1	0	0
##	8	8	8	0	0	0	0	2	1