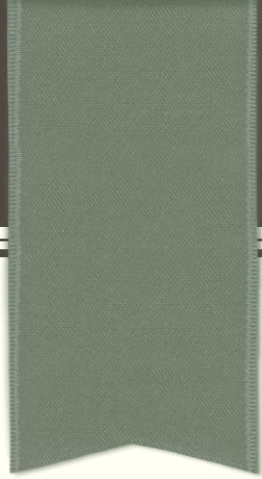




A Q-METHODOLOGY APPROACH FOR THE EVALUATION OF LAND ADMINISTRATION MERGERS





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EVALUATION APPROACH

Definition of the parameters of the evaluation.

- **Introduction and Background**
- **Objective and Research Question**
- **Description of the Qmethodology Approach**

From which observations is the evaluation going to be done

- **Qsorting Observations**
- **Factor Extraction and Analysis**
 - **Varimax and Manual rotation**
 - **Factor Loadings**

Contd

Factor Narratives

- **Comparison of Narratives**

Judgement and Hypothesis generated

INTRODUCTION AND BACKGROUND

The nature of Land administration accommodates diversity in terms of both spatial data handling activities and the expertise involved, which supposedly aims to satisfy the unpredictable demands of land data and the diverse demands of the customers arising from the land

- **Hannah et al. (2009) records an estimate of closer to 200 competencies of surveyors;**

HOWEVER

The changing names (determined by Stealth rather than Statute) from Surveying to Geomatics to Geosurveyor indicates the potential reservations that is within the spatial community.(Coutts et al, 2017)

The clash between the external drivers to merge with the internal perceptions on what to merge at operational level is an indication of the hidden and preferred deeper belief systems/value systems (de Vries et al, 2015)

Yet despite of this widely accepted knowledge, there is scanty theoretical knowledge concerning the psychological methodologies that can extract the deeper perceptions from the diverse spatial expertise in order to explain the invisible control arm of the polarised reception of change.

**Msc: EVALUATION OF
mergers OF
CADASTRAL
SYSTEMS: A corporate
cultural perspective**

**Objective : to evaluate
corporate culture changes in
cadastral mergers from the
organisational culture
perspective a Value system
was used as the key Indicator
for measuring Organisational
Culture**

**A research paper was
developed thereafter:
Mergers in land data
handling, the blending
of cultures**

**“what can a corporate
culture perspective
contribute to the
dilemmas, problems
and solutions when
land administration
agencies consider
pursuing**

This paper evaluates the effectiveness of Q methodology towards modelling the diverse psychological perceptions of spatial professionals who are in a widely contested decision of merging the cadastre and land registry components of Land administration using the Swedish Cadastral System as a case study.

Research Question

How does Q methodology enable effectiveness in modelling the diverse psychological perceptions of spatial professions in a merger of land registry and cadastre?

How can an evaluation of the effectiveness of Q methodology in modelling the perceptions of spatial professions in a merger of land registry and cadastre be done?"

Placed in layman terms the aim is to achieve a question: "Can Q methodology really achieve the role of modelling the diverse perception of cadastral experts in a merger?"

Q METHODOLOGY APPROACH

CONCOURSE DESIGN

- A value system is used to extract the deeper individual's perceptions as prescribed in Muparari 2013 & (de Vries et al, 2016); 36 statements are constructed (Competing Values framework)

PARTICIPANT SELECTION

- 18 participants with the Land administration merger of Land registry and Cadastre are nominated purposively

Q SORTING EXERCISE

- 18 participants rank the 36 statements/a condition of instruction is provided/

FACTOR EXTRACTION AND ANALYSIS

- PQMethod Software used
- Varimax Rotation (PCA)
- Manual Rotation (CFA)

Q METHODOLOGY APPROACH: NARRATIVE FORMULATION

Classification of Quantitative findings from statistical processing

- Statements scoring +5
- Statements ranking higher in that particular cluster of value system than any other cluster; statements ranking higher than other
- Statements ranking lower in that particular cluster of value system than any other cluster;
- Statements scoring -5

Qualitative data

- Both spontaneous and strategically collected from an interview (+5, 0 & -5)

OBSERVATIONS/RESULTS (DURING Q SORT)

Statement 1: We depend on each other to complete a task. We share information and knowledge amongst us

**Spontaneous reaction: “ I am a la
advisor.....they need my advice....
about their job.....Surveying is
them.....I do not belong to any
division but I serve the whole org**

OBSERVATIONS/RESULTS (DURING Q SORT)

Statement 3: We depend on improving standardised procedures which were established long ago. We therefore have low risk

Spontaneous reaction: “It’s all about data structures,....there are numerous around here....ask them.....”

- **The evidence of the effect of Q sorting scale in extracting the subjectivity were mainly reflected by spontaneous talking (of the participant) drawn from those spontaneous reactions documented during the Qsorting exercise.**
- **Freud's pleasure and Pain principle is reconfirmed and Reality principle**

FACTOR EXTRACTION AND ANALYSIS PCA AND VARIMAX ROTATION

QSORT		1	2
1	Qsort 1	0.0189	0.865
2	Qsort2	0.9012X	0.1629
3	Qsort3	0.1195	0.7327X
4	Qsort4	0.0973	0.8460X
5	Qsort 5	0.0973	0.3406
6	Qsort6	0.0973	0.3775
7	Qsort 7	0.0973	-0.0030
8	Qsort8	0.0973	0.4850
9	Qsort 9	0.0973	0.2875
10	Qsort 10	0.0973	0.5968X
11	Qsort 11	0.0973	0.3860
12	Qsort 12	0.2824	0.3150
13	Qsort 13	0.2113	0.1654
14	Qsort 14	<u>0.6952X</u>	0.1301
15	Qsort 15	0.3146	0.0993
16	Qsort 16	0.3508	-0.1191
17	Qsort 17	-0.0128	0.1071
18	Qsort 18	-0.1297	0.0074
% expl.Var.		13	15

A narrowed relationship between qsort1 and the factors 3 and 4, qsort 14 and factors 1 and 3 is required !!!!!

FACTOR EXTRACTION AND ANALYSIS: PCA AND VARIMAX ROTATION

QSORT

```
1 Qsort 1      e
2 Qsort2      e
3 Qsort3      -e
4 Qsort4      -e
5 Qsort 5      e
6 Qsort6      e
7 Qsort 7      e
8 Qsort8      e
9 Qsort 9      e
10 Qsort 10    e
11 Qsort 11    e
12 Qsort 12    e
13 Qsort 13    e
14 Qsort 14    e
15 Qsort 15    e
16 Qsort 16    e
17 Qsort 17    e
18 Qsort 18    e
```

% expl.Var.

Although the Automatic Varimax Rotation is now indicating a singular relationship between the Q sorts and the factors, Q sort 7 still reflects a significant loading on factor 1. However Factor arrays can be constructed.

A manual rotation is considered as an alternative to sharpen the positions of the Q sorts

22 degrees Manual Rotation

QSORT	1	2	3
1 Qsort 1	0.7427X	0.0262	0.0498
2 Qsort2	0.3597	-0.4229	-0.5133X
3 Qsort3	0.0825	-0.5333X	0.1761
4 Qsort4	0.2044	-0.6796X	0.3512
5 Qsort 5	0.1678	-0.3821	0.3226
6 Qsort6	0.4738	-0.4459	-0.2348
7 Qsort 7	0.6906X	-0.1250	-0.4261
8 Qsort8	0.5053X	-0.3158	0.1320
9 Qsort 9	0.6153X	-0.4019	-0.3345
10 Qsort 10	0.4241	-0.5768X	0.0216
11 Qsort 11	0.6985X	-0.3881	0.0791
12 Qsort 12	0.7804X	-0.1485	0.3549
13 Qsort 13	0.7055X	0.0772	-0.1376
14 Qsort 14	0.7973X	0.0773	-0.2401
15 Qsort 15	0.7803X	-0.2806	0.1698
16 Qsort 16	0.8113X	0.1627	-0.1250
17 Qsort 17	0.4959X	-0.0336	-0.0792
18 Qsort 18	0.4939	0.2185	0.4335
% expl.Var.	35	12	7

-66 degrees Rotation

QSORT	1	2	3
1 Qsort 1	-0.0052	0.7344X	0.0529
2 Qsort2	0.4560	0.3475	-0.5297X
3 Qsort3	0.5228X	0.0755	0.1800
4 Qsort4	0.7040X	0.1906	0.3728
5 Qsort 5	0.3431	0.1626	0.3030
6 Qsort6	0.5093X	0.4640	-0.2955
7 Qsort 7	0.1478	0.6740X	-0.3895
8 Qsort8	0.3117	0.4981X	0.1358
9 Qsort 9	0.4081	0.6061X	-0.3042
10 Qsort 10	0.5881X	0.4139	0.0439
11 Qsort 11	0.3955	0.6889X	0.0931
12 Qsort 12	0.1541	0.7858X	0.3829
13 Qsort 13	-0.0788	0.7258X	-0.1495
14 Qsort 14	-0.0464	0.7795X	-0.2082
15 Qsort 15	0.2974	0.7681X	0.1761
16 Qsort 16	-0.1378	0.8039X	-0.1079
17 Qsort 17	-0.0298	0.5840X	-0.1653
18 Qsort 18	-0.1964	0.4846	0.4083
% expl.Var.	13	35	8

OBSERVATIONS ON: Comparison of factor configurations

**Rotation
results in**

- **the visible adjustments amongst the Q sort configurations. Particular Q sorts cluster together after a new factor positioning has been done**
- **New Q sort relationships are introduced**
- **Following the rotation, new correlations are established: One can obtain a distortion but equally one can obtain a sharpened differentiation of views**

FACTOR ARRAYS: PCA VARIMAX ROTATION (3 FACTORS)

Statement no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Factor 1	2	-2	1	-3	3	0	1	-3	4	3	2	-1	1	0	4	-5	1	2
Factor 2	5	-3	-2	-3	4	-1	3	0	0	-1	1	0	3	-4	4	-5	1	-1
Factor 3	5	-4	0	0	4	-3	2	-5	3	2	0	0	1	-1	2	-2	1	4

Statement no	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Factor 1	1	-2	5	-1	0	0	-1	-2	-4	-1	4	0	3	-1	-3	-2	0	2
Factor 2	0	1	2	-1	-1	-2	-4	1	2	2	-2	0	-2	0	3	2	1	-3
Factor 3	-2	-1	-2	1	2	0	-3	-4	0	1	-2	3	3	1	-3	-1	-1	-1

FACTOR ARRAYS: CFA 22 DEGREES MANUAL ROTATION

Statement no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Factor 1	4	-2	1	-2	5	-2	1	-5	4	3	2	0	0	-1	3	-4	1	2
Factor 2	-5	2	3	3	-4	2	-3	1	-1	0	-2	0	-3	4	-4	5	-2	1
Factor 3	-5	2	1	0	-3	2	-1	3	-4	-3	3	0	-2	0	1	-1	-2	-4

Statement no	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Factor 1	1	-1	3	-1	1	0	-1	-3	-3	0	-4	0	2	-1	-3	-2	0	2
Factor 2	0	-1	-2	1	1	2	3	-1	-1	-1	1	0	2	0	-3	-2	0	4
Factor 3	1	0	1	-3	-1	-1	4	4	3	0	0	-2	-2	-1	2	1	2	5

FACTOR ARRAYS: CFA – 66 DEGREES MANUAL ROTATION

Statement no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Factor 1	5	-3	-2	-3	4	-1	3	-2	2	-1	3	0	3	-4	4	-5	2	-1
Factor 2	4	-2	1	-2	5	-2	1	-5	4	3	2	0	0	-1	3	-4	1	2
Factor 3	-5	2	1	0	-3	2	-1	3	-4	-3	3	0	-2	0	1	-1	-2	-4

Statement no	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Factor 1	0	0	1	-1	0	-2	-4	0	2	2	-2	1	-1	1	1	1	0	-3
Factor 2	1	-1	3	-1	1	0	-1	-3	-3	0	-3	0	2	-1	-4	-2	0	2
Factor 3	1	0	1	-3	-1	-1	4	4	3	0	0	-2	-2	-1	2	1	2	5

Factor 1 Comparison

Statement no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F(1) Varimax	2	-2	1	-3	3	0	1	-3	4	3	2	-1	1	0	4	-5	1	2
F(1) 22°Rotation	4	-2	1	-2	5	-2	1	-5	4	3	2	0	0	-1	3	-4	1	2
F (1) -66°Rotation	5	-3	-2	-3	4	-1	3	-2	2	-1	3	0	3	-4	4	-5	2	-1

Statement no	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
F(1) Varimax	1	-2	5	-1	0	0	-1	-2	-4	-1	4	0	3	-1	-3	-2	0	2
F(1) 22°Rotation	1	-1	3	-1	1	0	-1	-3	-3	0	-4	0	2	-1	-3	-2	0	2
F (1) -66°Rotation	0	0	1	-1	0	-2	-4	0	2	2	-2	1	-1	1	1	1	0	-3

Factor 2 Comparison

Statement no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F(2) Varimax	5	-3	-2	-3	4	-1	3	0	0	-1	1	0	3	-4	4	-5	1	-1
F(2) 22°Rotation	-5	2	3	3	-4	2	-3	1	-1	0	-2	0	-3	4	-4	5	-2	1
F(2) -66°Rotation	4	-2	1	-2	5	-2	1	-5	4	3	2	0	0	-1	3	-4	1	2

Statement no	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
F(2) Varimax	0	1	2	-1	-1	-2	-4	1	2	2	-2	0	-2	0	3	2	1	-3
F(2) 22°Rotation	0	-1	-2	1	1	2	3	-1	-1	-1	1	0	2	0	-3	-2	0	4
F(2) -66°Rotation	1	-1	3	-1	1	0	-1	-3	-3	0	-3	0	2	-1	-4	-2	0	2

Factor 3 Comparison

Statement no	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
F(3) Varimax	5	-4	0	0	4	-3	2	-5	3	2	0	0	1	-1	2	-2		4
F(3) 22° Rotation	-5	2	3	3	-4	2	-3	1	-1	0	-2	0	-3	4	-4	5	-2	1
F(3) -66° Rotation	-5	2	1	0	-3	2	-1	3	-4	-3	3	0	-2	0	1	-1	-2	-4

Statement no	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
F(3) Varimax	-2	-1	-2	1		0	-3	-4	0	1	-2	3	3	1	-3	-1	-1	-1
F(3) 22° Rotation	1	0	1	-3	-1	-1	4	4	3	0	0	-2	-2	-1	2	1	2	5
F(3) -66° Rotation	1	0	1	-3	-1	-1	4	4	3	0	0	-2	-2	-1	2	1	2	5

COMPARISON OF FACTORS 1, 2 & 3 OF ALL ROTATIONS

After the Varimax rotation, the 22 and -66 degrees rotation confirms that there are two additional factors to talk about.

Although factor 2 of the PCA and Varimax rotation looks exactly similar to factor 1 of -66 degrees rotation, the configuration of the two remaining factors in -66 degrees are different from factors 1 and 3 of the varimax rotation.

The additional two factors 2 and 3 of -66 degrees rotation are confirmed by factors 1 and 3 in the 22 degrees rotation.

CONTD

Factor 3 of the varimax rotation still shows its uniqueness and therefore it is kept as it is.

The comparison eventually calls for the utility of factor 2 and 3 in varimax rotation, factor 1, 2 and 3 of 22 degrees manual rotation.

OUTPUT FROM THE NARRATIVES

*Varimax
rotation Factor
2*

*“Adaptive Problem
solving approach:
Against hierachy
and surbordination”*

*Varimax
rotation Factor
3:*

*“Guarded
Flexibility”/
“Bounded
Flexibility”*

Contd

*22 degrees
Rotation:*

```
graph TD; A["22 degrees Rotation:"] --- B["Factor 1 Narration:"]; A --- C["Factor 2 Narration:"]; A --- D["Factor 3 Narration:"];
```

*Factor 1 Narration:
“flexibility in law/ a
positivist approach
to law”*

*Factor 2 Narration:
“Dedicated for
task execution”*

*Factor 3 Narration:
“Seperate roles
but integrated by
technology”*

conclusions

Q methodology achieves effectiveness through

- **The Qsorting exercise (conditions favourable must be chosen however)**
- **BOTH the varimax and manual rotation and Sharpened Q sort configurations that are key pointers to the Qualitative data**

Results of Q methodology may be used to solve current existing problems and to see the progress.

conclusions

Otherwise participants change due to various factors.

The methodology can be effectively used to check the developments in the same setting with the same participant. It be used successfully to vary the attitudes and moods of the individuals successfully.

Contd

Q methodology is effective
in Hypothesis generation
than Hypothesis testing

Thank you !!!!!

