CARDS – Computer Assisted Regulatory Decision Support
- jumping to greater effectiveness -

CARDS, what is it?
CARDS (in Dutch CATS, hence the CATS-emblem) is a combination of a method, a model and software to arrive at optimal effectiveness of oversight. Two work sheets containing various information and assessments suffice to get CARDS started to arrive a longitudinal (4-years), goal-directed strategy, combining various preventive and repressive methods to various subpopulations, e.g. an economic sector. CARDS uses transparent, plausible steps to specify the strategy, that will yield measurable output and outcome.

How does it work?
For CARDS to be able to formulate a strategy it needs information from internal data sources and input from expersts in the field. To specify the main element of the CARDS-model (see circles):
1. the size of subpopulations and the degree of (non)compliance.
2. assessment by domain experts of causes of non-compliance;
3. an indication of priorities.

Supervisor X	A. ta		B. complia nce analysis	C. risk-seriousness		D. T11-causal cluster analysis (10 point-scale; the lower, the more vulnerable)					E. prior-ities
Branch; catering industry with subbranches	nr. of org.	relative % of organ.	non-compli ance perc.	serious ness sub-branch	ser. per org.	a. know	b. can/ able	c. want	d. control	e. sancti on	% of total hours)
1 Hotel (5510)	34	5%	50	5%	0,15%	8	7	8	8	8	4
2 Restaurant/Snackbar (561)	492	78%	50	76%	0,16%	6	6	6	5	7	63
3 Café/Bar (5631, 8552)	80	13%	50	13%	0,16%	7	6	5	5	6	11
4 Disco/Pop-podium	6	1%	10	0,2%	0,03%	8	8	8	6	7	0,2
5 Events	6	1%	10	0,2%	0,04%	8	8	8	7	7	0,2
Other 6. special organizations (problematic)	15	2%	100	5%	0,33%	4	4	4	5	6	12
Total of all subsectors	633	100%	48	100%	0,16%	6,1	5,9	5,9	5,1	6,8	90

In addition CARDS asks experts to judge all available and potential preventive and repressive methods (circle, step 4). See table on the right.

Using these inputs CARDS calculates a varied preventive-repressive strategy specified for a number of years, usually 4 years, to allow supervisory bodies to achieve substantial impact. On this basis CARDS operationalizes the strategy outlined by defining a set of specific tasks, outlining the hours available and the

Column 1. Repressive methods (M1-5) and preventive methods of supervision (M6-10)	2. actual distribuio nin %	3. desired distributio n %	standar d time	4 Effect .Coeff .	5. Ef value actu %)
1. integral checks (checking all relevant standards) via inspection	57	29			
1a. random, sample or visit once in a while	47	5	12	1	
1b. select; visit depending on the risk per subgroup or company		12	12	2	
1c. selective, intensive control of attention companies	10	12	18	3	
2. specific controls; risk based, shorter (such as flash control, aspect or theme)	10	11			
2a. BRZO					
2b. theme control	10	5	8,5	2	
2c aspect / part control		4	7.5	3	
2d. flash control		2	4	4	
2nd. variable control					
3.special checks (responsive, i.e. with direct cause such as follow-up, incident investigation)	15	15			3
3a. follow-up	5	5	4	0,5	
3b. incident investigation (complaint, request or incident)	10	10	8,5	3	
3c. informative or advisory audit					
3d. admission or acceptance inspection					
4. Administrative digital controls	5	5			
4a. administrative control; paper	5	5	4	2	
4b. digital control in a general way (e.g. remote environmental accounting)					
5. sampling as a control method	3	5	12	3	
total repressive methods 1-5 (%)	90	65		(2,4	
total preventive methods 6-10 (%)	10	35		(3,0)	
6. Warning enforcement communications aimed at deterrence	10	5		4	
7. general communication aimed at information, explanation, conviction, eg fact sheets		5		3	
8. digital checklist by email		5		3	
9. consultation, cooperation with industry or fellow enforcers		5		2	
10. (other) projects (such as target group in order, improved risk analysis, developing innovative methods	0	15			
10 a. Supplement, purify or enrich target group,		4		3	
10b. setting up and developing digital checklists,		4		3	
10c. other developments, eg in communication methods or improved risk analysis		4		3	
10d. branch analysis and strategy formation;		3		3	
total 1-10 (in %)	100	100	nvt.	(2,6)	

tasks		stan dard time	number of controls year 1	availa ble hours	explanation	coopera tion yes/ no
	Repressive methods					
1.	1a. aselect sample	12	6	68	standard working method	no
2.	1b. selective sample; depending on risk or subbranch	12	14	163	together with meth. 10 a, c, project 13 en 15	yes
3.	1c. selective intensive control	18	41	734	high expertise required	no
4.	2b. theme control	8,5	8	68	in collaboration with meth. 7., project 11	yes
5.	2c. aspect control	7,5	7	54	together with meth. 7., project 11	yes
6.	2d. flash control	4	7	27	together with meth. 7., project 11	yes
7.	3a. follow up controls	5	6	30		no
8.	3b. incident follow up (complaint, request or accident)	8,5	4	34		no
9.	4. administrative control	4	43	170	together with meth. 7., project 11	yes
10	5. physical sampling	12	11	136	specific to norms	
	Preventive methods	144	nr. of projects			
11	7/8 general communication (e.g. factsheet)	144	2	272	together with partial controls	yes
12	9. consultation and cooperation with colleagues and stakeholders,	144	1,7	238	met 10a en 10c.	yes
	Development-innovation					
13	10a. information improvement e.g. through Chamber of Commerce check [2 projects; 13a en 13b]	144	2	272	t.b.v. selecte controles; 1b en 2b., samen met meth 10c	no
14	10b. digital checklists, also email [2 projects; 14a en 14b]	144	2	272	with respect to individual controls 2b	no
15	10c. other developments, e.g. communication methods or improved risk analyses, [2 projects 15a en 15b]	144	2	272	with respect to 10a-c.	no
16	10d. branch analysis, analysis of results of controls, evaluation of projects	144	0,3	41	cooperation with all projects	yes

qualities needed to execute the tasks well. Some of these tasks can be executed autonomously, other require cooperation with other, internal or external, parties. These specific tasks can be matched by the professional personnel and units that are best equipped and motivated to execute them.

CARDS as a method
CARDS is a content model and it is software, but above all CARDS is a method to help supervisory agencies to a better, more effective job, to see the options available, to weight them adequately, to explain the strategy arrived at to others. To do so, CARDS uses a number of key indicators or key performance measures ('kengetallen'), some of which are conventional (such as control density), others are new (e.g. contact density) and some can be considered revolutionary (.e.g. preventive impact value). CARDS will even yield a prediction of the change in compliance based on the new strategy.

key indicators	until now (act)	desirable (futu)	change index	explanation
time per organization (hours) (TO aver.)	2,3	2,3	100	capacity (fte) not increased
general control percentage (CooP)	52%	42%	81	decreased, ambivalent
control percentage of suspected compliers(CooPcomp)	41%	25%	60	decreased substantially; positive
control percentage of suspected offenders (CooPoff)	11%	17%	162	increased substantially; positive
contact percentage (CoaNotCooP)	94%	142%	150	strong increase, very positive
overall contact percentage; sum of control and contact	147%	184%	126	substantial increase, positive
basic ratio of prevention of repression	90/10/0	65/20/15	350%	strong change, more prevention and development
expected value				
expected effectiveness value repression(EEVR)	149	153	103	no decrease
expected effectiveness value prevention (EEVP)	40	105	263	strong increase
expected total supervisory effectiveness value (EEVT)	189	258	137	significant increase
percentage non compliance	49%	46%	106	will decrease

In effect CARDS is a logical evolution from its methodological foundation, a problem-solution cycle of management and operations, that follows a few basic steps; integrative analysis, flexible strategy, constructive execution and creative evaluation. This cycle will help supervisors to learn and to achieve better results each time by innovation, experiment, cooperation and comparison. CARDS gives new meaning and new tools to the concept of 'progressive insight'.

CARDS in the implementation stages
CARDS is well suited to formulate supervisory strategies, but its functionality does not stop here. We have distinguished various contexts, in which CARDS can be helpful, also in the implementation stages.
1. CARDS can be used as an **evaluation framework** to assess new and existing supervision plans.
2. The use of new performance indicators such as contact intensity and preventive/repressive 'effectiveness value' means that CARDS is a new and **operational method for optimizing effectiveness**, in planning, execution and evaluation. Improvement and **need for improvement** will be signaled by these parameters and indicators.
3. **Comparing practice and performance** Comparing these parameters and indicators between units and agencies helps to learn and cooperate between supervisors. Discussing and elaborating differences will yield numerous directions and clues for improvement and may lead to ambitions to make progress a collaborative effort.
4. CARDS is an **expert model,** a model integrating experience, expertise and expectations, that can be put to test by practice and that can adapted under the influence of practice, observation and results.
5. **Progressive insight.** CARDS may therefore help to evaluate plans, report evaluations and readjust plans for subsequent use. without CARDS
Overall CARDS helps supervisors to do their job in a more reflective, flexible and effective manner.

Components and examples
CARDS consists of a number of components. Below examples are given for each type:

Components	Examples
facts, data	size of subgroups, degree of non-compliance
assumptions	interventions should be proportional to the negative consequences of non compliance and to t he attribution of causes; supervisory agencies allocate or create space (time and money) for innovation and development of new methods and strategies and to improve their data for analysis and evaluation
estimates	T11-causal cluster analysis, (relative) seriousness of non-compliance
calculations	seriousness related to subpopulation, non-compliance; proportion of accidental or purposeful non compliance
performance indicators	'classic indicators' such as control frequency, supervision time per enterprise, new indicators: contact frequency, basic proportion prevention-repression, expected impact value expected degree of non-compliance

Variety of use:
CARDS can be used by internal or external advisors – in different ways:
- *support tool*; to formulate supervisory strategies in an expedient way, with limited resources but with extensive insight;
- *educational tool*; for existing or new professional staff to understand the basic principles of regulation and oversight;
- *discussion tool*; to discuss the most essential choices with management and policy departments
- *innovation tool*; integrated framework to assess the main needs for improvement of methods, processes and intervention strategies;

CATS is very flexible and can be adapted tot he vision as well as regulatory domains of supervisory agencies.

CARDS works/is effective!
CARDS has been tested, applied and improved in the context of 5 environmental agencies in the Netherlands on two different subjects and target groups. This application has given rise to its latest improvement, that is the specification of tasks that facilitate the attribution of tasks tot he varying expertise and motivation of professional supervisors and staff.

CARDS in practice
CARDS can be employed in two ways:
- as a (series of) project(s); CMC will collaborate with the supervisory agency to construct supervisory strategies.
- as a license: the supervisory agency will avail of the tool itself after transfer, not only of the software and additional instruments such as handbook and working sheets. The transfer includes inhouse training needed to understand and handle CARDS well and to increase expertise in effectiveness-directed methodology.

If you find it difficult to choose between the two, you may try the first method to judge for yourself whether it is attractive to switch to the second method.

Omgevingsdienst
Veluwe IJssel

Longitudinal supervisory strategy
Catering industry

Version	1.2
Date;	April 2020
Supervisory agent:	OVIJ
Branch:	Catering industry
Years:	2020-2023
Responsible profession.	Henk Brueren
Support	CARDS, CMC, Dick Ruimschotel

Advantages of CARDS laid out:
Let us summarize the advantages of CARDS as we see them:
1. *Information based*: CARDS combines objective information with insights acquired in practice
2. *Support*: wherever possible input from professionals is used in an efficient manner, saving time and money to be used elsewhere. This involvement is known to create commitment to the results.
3. *Effectiveness*; limited but essential input yields transparent strategies that are expected to increase effectiveness in ways that can be monitored.
4. *Speed and flexibility:* use of expert models and Artificial Intelligence speeds up process and creates room for experiment and improvement.
5. *Fit/custom made*; easy adaptation to specific area of supervision makes the general tool custom made/fit.

These qualities makes CARDS an innovative tool that will help supervisory agents not only to make a step ahead, but to jump ahead.

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