New Map Production Environment - optimizing map production

Morten Winkler & Stig Heinesen Danish Geodata Agency Data Visualization

and the second state of the

A Washington and

In the department of Data Visualization we produce maps for many purposes.

Sometimes it must be done quickly!











What if we had:

1 data model

1 database

1 method

1 tool

for producing 25 different topographical maps

out of always updated data

Bondebroen

Rønne





Aim:



- robust and flexible production environment
- common environment for development and production
- change to ESRI-ArcGIS platform
- DGA has a limited amount of applications and providers
- common platform = less dependency on key persons
- automatic continuous updating = "map alert"
- automation: Maps without hands



Effects:



- better quality assurance: better quality of maps
- production time reduced: efficiency
- reduced use of resources: efficiency
- automation, reuse of data and cartography: homogenous products
- shared knowledge: teamwork



2 main principles:

central production **database**, shared data MPEdb Visualization including introduction of _ cartographic representations very limited need for manual _ corrections Indelukket (OV

-

But input data have to be valid and complete!



MPE is worldwide



MPE has a common data model





Danish Geodata Agency

Danish Ministry of the Environmen	t		Map Production	n Enviro	nment
All Features V					
RapidsP	~	Roadi			
RecreationalPierA		Roade			
RecreationalPierL		Feature Name :	Road		
RecyclingSiteA		Feature Code : /	AP030		
ReefA		Source Scale :	. Line		
ReefL		Source Scale .			
ReservoirA					
RestrictedAreaA					
RiceFieldA		Object Definition	on		
RigP		A route with a sp	becially prepared surface that is inte	ended for use by w	heeled vehicles.
RiverA					
RiverL					
RoadInterchangeP		Object Descript	tion		
RoadL		Nono			
RoadsideRestAreaA		None			
RoadsideRestAreaP					
RockFormationA					
RockFormationL		Attributes			
RockFormationP		Attribute Code	Attribute Name	Attribute type	Domain / Description
RoundhouseA					35 Boad Interchange
RoundhouseP		CON	Route Width Constriction Type	Integer	998 : Not Applicable
RuinsA					0 : Unknown
RuinsP					1 : Under Construction
RunwayA					2 : Abandoned
RunwayL		FUN	Condition of Facility	Integer	3 Destroyed
RunwayP					Dismantied Eully Eulertional
SabkhaA					13 Damaged
SaltEvaporatorA					
SaltFlatA					1 Primary Route
SandDunesA		LUCT	Thoroughforo Close	Integer	2 : Secondary Route
SeawallL			Thoroughlare Class	integer	3 : National Motorway
SettlementA					4 : Local Route
SettlementP					101 : Minor Route
SettlingPondA					U : Unknown
SettlingPondP			Vertical Relative Location	Integer	44 : On Surface
SewageTreatmentPlantA			Chical Relative Location	meger	45 : Above Surface
ShantyTownA					101 : Above Waterbody Surface
ShedA		LTN	Track or Lane Count	Integer	
ShedP					0 : Unknown
SkiJumpL		MES	Median Present	Integer	1000 : Without Median
SKIJUMPP					1001: With Median
SlipwayA		NAM	Name	String	
SuiceGateL		NFI	Named Feature Identifier	String	
SiliceGateP		NFN	Name Identifier	String	
ShowlesEigldA					0 : Unknown
ShowiceFieldA		RST	Load-bearing Surface Type	Integer	1 : Hard/Paved
SolisuraceRegionA	V				2 : Loose/Unpaved
SolarPanelP					0 : Unknown

Content of the database

ArcCatalog - Database Connections\kpm_kpm_read.sde				
<u>File Edit View Go</u> <u>G</u> eoprocessing <u>C</u> ustomize <u>W</u>	indows <u>H</u> elp			
🗄 📤 📾 🗊 🖹 🗙 🎛 🏢 🎆 🎛 🔕 📮 🗔	🚳 🖸 । 加 📲 🔍 🔍 🧐 🎱 🗇 🔶 । 🗇 👘 ।	◎ 計算: 11 早見 15 資		
Database Connections \kpm_kpm_read.sde	· • -			
IRBB.	100			
Catalog Tree	# × Contents Preview Description	n	ArcToolbox	₽×
 Toolboxes Database Servers Database Connections Add Database Connection kpm_kpm.sde kpm_s10.sde kpm_s10n.sde kpm_s110m.sde kpm_s12.sde kpm_s180.sde kpm_s20.sde 	Name	Type SDE Feature Dataset SDE Feature Dataset	 ArcToolbox 3D Analyst Tools Analysis Tools Analysis Tools Cartography Tools Coverage Tools Coverage Tools Data Interoperability Tools Data Management Tools Data Reviewer Tools Data Reviewer Tools Editing Tools Geocoding Tools Geostatistical Analyst Tools KPM Linear Referencing Tools 	
 kpm_s50.sde kpm_s500.sde kpm_s50m.sde kpm_s50m.sde kpm_stihe.sde kpmtest2-kpmtest2.sde GIS Servers My Hosted Services Ready-To-Use Services Ready-To-Use Services Morkflow Manager Databases 			 Multidimension roots Network Analyst Tools Parcel Fabric Tools Production Mapping Tools Schematics Tools Server Tools Space Time Pattern Mining Tools Spatial Analyst Tools Spatial Statistics Tools Stracking Analyst Tools Workflow Manager Tools 	

Schema	No. rows	Size (MB)	Extent	Featureclasses	Representations
S10	25.810.558	5525	DK, GL	82	1
S50	100.516.149	28174	global	296	2
S250	127.234.243	25307	global	379	1

Automatic updating, $+/\div$ corrections



What are representations?



Rule GUID	Rule Type	Specifica I	Descr Proce	ssing - Rule Description	Workspace	Dataset	Layer	Rep/Field Name	Pre Code	SQL Statement
002D71D0	Representa	M718	106	Adm	kpmdb_m718-toma.sde	 NamedBuildingP	 NamedBuildin +	M718_NamedBuildingP	-	SELECT < Target Table
03EF295F	Representa	M718	47	AdministrativeRegionA_L		 AdministrativeRegior	 Administrative -	M718_AdministrativeRegionA_L		SELECT < Target Table
D78E8627	Representa	M718	95	ApronA	kpmdb_m718-toma.sde	 ApronA	 ApronA +	M718_ApronA		SELECT < Target Table
(E4788105	Representa	M718	115	Beacon	kpmdb_m718-larsho.sde	 MaritimeNavigationE	 MaritimeNavig 🗸	M718_MaritimeNavigationBeacor		SELECT < Target Table
06AFC060	Representa	M718	41	BerthingStructureL	kpmdb_m718-toma.sde	 BerthingStructureL	 BerthingStruct +	M718_BerthingStructureL	-	SELECT < Target Table
(2D63422D	Representa	M718	40	BreakLineL	kpmdb_m718-toma.sde	 BreakLineL	 BreakLineL -	M718_BreakLineL		SELECT < Target Table
[F97B335B	Representa	M718	75	Building	kpmdb_m718-toma.sde	 GeneralBuildingA	 GeneralBuildir +	M718_GeneralBuildingA	-	SELECT < Target Table
09DCDBE	Representa	M718	77	Camping	kpmdb_m718-larsho.sde	 NamedLocationA	 NamedLocatic 🗸	M718_NamedLocationA		SELECT < Target Table
62647B6F	Representa	M718	15	CemeteryA	kpmdb m718-toma.sde	CemeteryA	CemeteryA +	M718 CemeteryA		SELECT < Target Table



1

2

3

Road Type **RuleID Value** Freeways Roads Streets

Shape	RoadType	RuleID	Override
Polyline	Freeway	1	Blob
Polyline	Road	2	Blob
Polyline	Road	2	Blob
Polyline	Street	3	Blob
Polyline	Freeway	1	Blob
Polyline	Street	3	Blob

Feature Class Table with

Representation Fields





Ŵ



SERIES M 718 SHEET C43 EDITION 2 - FMTGEO



Production example: 50k defence map

Development of

- frame
- mapsheets, content
- texts
- grid
- legend
- SOP







Production example: 50k defence map

- Using Data Driven Pages to make a complete map series containing 115 map sheets

- Issue with overlapping UTM zones

Danish Geodata Agency



K/1

F81

STUBBEKØBING



Modernising 50k defence map

2010 (Maps without hands)

Total DK production from base scale (1:10.000) to end product (1:50.000) 1¹/₂ years (from start to print) 10-15 employees involved



2014 (Maps without hands 2.0)

Total DK production:

1¹/₂ years (but fewer resources) 5 employees involved

Cartographic production time: average **36 hours** pr. map sheet

Generalization process: 9 months for all of DK



Cartographic production time: 4¹/₂ hours pr. map sheet



Can potentially be improved



Trap Denmark Topographic Atlas



published 6.11.2015



Why map production alert?



MEDECINS SANS FRONTIERES LÆGER UDEN GRÆNSER

Support for the Defense and Emergency Management

Effectively and quickly produce maps

TLM 1:50.000 all over the Earth

Max 1 hour per map

Map production fully automated



Total: 37 minutes

Per map: 9 minutes

Conclusion:



Rule based automatic map production enables:

- a standardized production platform for products and services nationally as well as internationally
- products updated centrally and continuously (in MPEdb), thus always synchronised with updates in base data
- we avoid dependency on key persons
- minimal need for "handwork", when product-workflow developed
- each product can be produced faster and more often



Thank you!

Morten Winkler Project Manager mwink@gst.dk Stig Heinesen GIS Specialist stihe@gst.dk



