

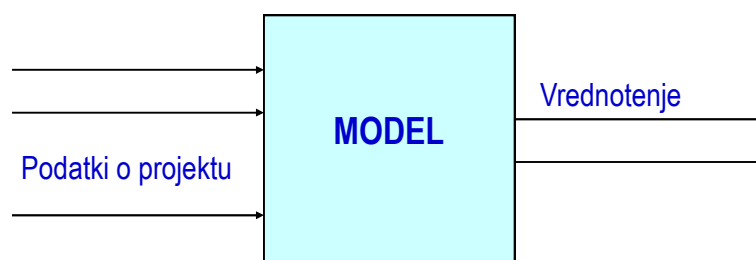
Praktični primeri uporabe
večkriterijskega modeliranja

Proizvodni program

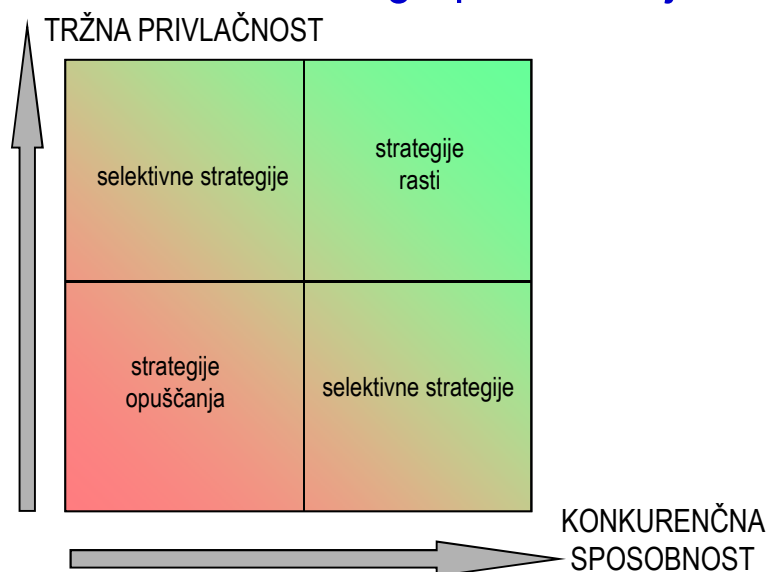
Vrednotenje proizvodnega programa

Problem: "Založba"

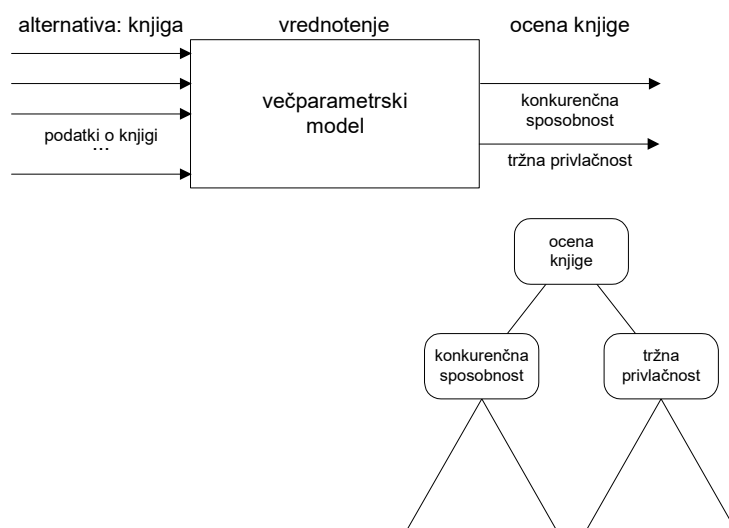
Razviti model za vrednotenje, analizo in spremljanje projektov (učbenikov) na nivoju izdaje posameznih knjig in na nivoju uredniških programov.



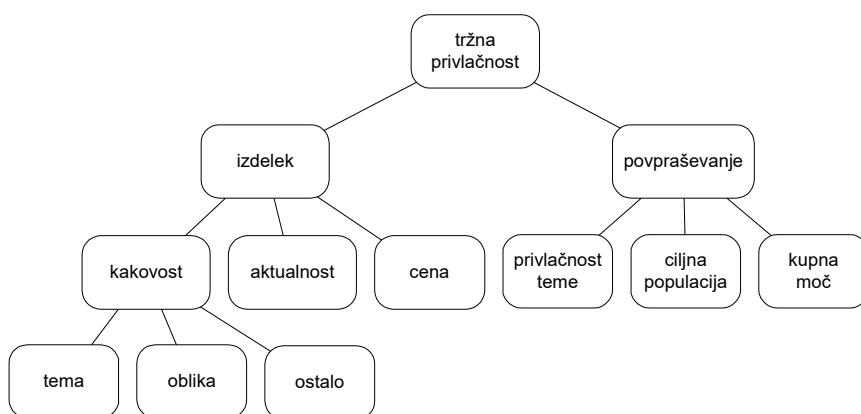
Matrika tržnega premoženja



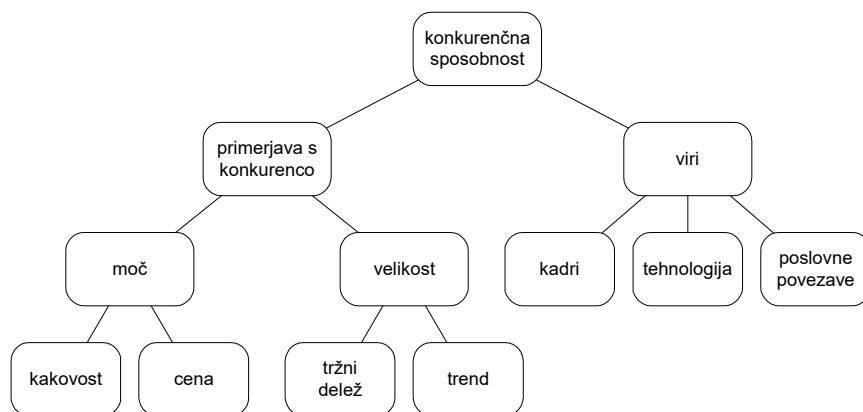
Model vrednotenja



Tržna privlačnost



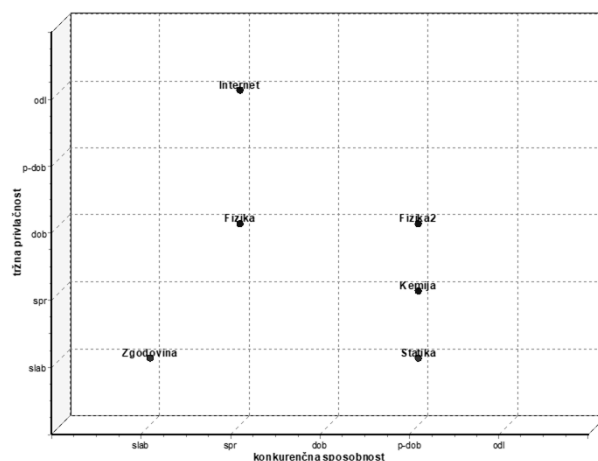
Konkurenčna sposobnost



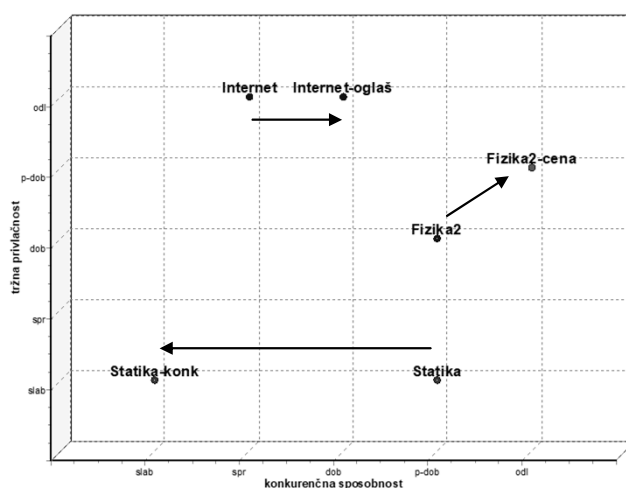
Model DEXi

Kriterij	Zaloga vrednosti	Fizika	Fizika2	Kemija	Zgodovina	Statika	Internet
ocena knjige	slab, spr; dob; p-dob; odl	spr	p-dob	dob	slab	slab	dob
konkurenčna sposobnost	slab, spr; dob; p-dob; odl	spr	p-dob	slab	slab	p-dob	spr
viri	slab, spr; dob; odl	spr	odl	dob	spr	spr	dob
kadri	slab, spr; odl	spr	odl	spr	spr	spr	odl
tehnologija	slab, spr; odl	odl	odl	odl	spr	odl	spr
poslovne povezave	slab, spr; odl	spr	spr	odl	spr	spr	spr
primerjava s konkurenco	šibki; prim; močni; ni	prim	prim	močni	šibki	ni	šibki
moč	slabši; prim; boljši; ni	prim	prim	boljši	prim	ni	prim
kakovost	slabši; prim; boljši; ni	prim	boljši	prim	slabši	ni	prim
cena	slabši; prim; boljši; ni	prim	slabši	boljši	boljši	ni	prim
velikost	majhen; srednji; velik	srednji	velik	srednji	majhen	velik	majhen
tržni delež	majhen; srednji; velik	srednji	srednji	srednji	majhen	velik	majhen
trend	pada; konst; raste	konst	raste	konst	konst	konst	konst
tržna privlačnost	slab, spr; dob; p-dob; odl	dob	dob	spr	slab	slab	odl
povpraševanje	slab, spr; dob; odl	spr	dob	spr	slab	slab	odl
privlačnost teme	neatr; nevtr; atrak	nevtr	atrak	nevtr	neatr	nevtr	atrak
ciljna populacija	minimalna; majhna; srednja; velika	velika	velika	srednja	srednja	minimalna	velika
kupna moč	nizka; povpr; visoka	nizka	nizka	nizka	nizka	povpr	povpr
izdelek	slab, spr; dob; odl	dob	spr	spr	slab	dob	odl
kakovost	slab, spr; dob; odl	dob	odl	spr	slab	dob	odl
tema	odl	odl	spr	spr	slab	spr	odl
oblika	slab, spr; odl	spr	odl	spr	spr	odl	odl
ostalo	ne; manj; več	manj	manj	manj	manj	manj	več
aktualnost	star; akt; nov	star	akt	star	star	akt	nov
cena	nespr; spr; ugod	spr	nespr	ugod	ugod	spr	spr

Vrednotenje: Matrika tržnega premoženja



Analiza: Kaj-če?



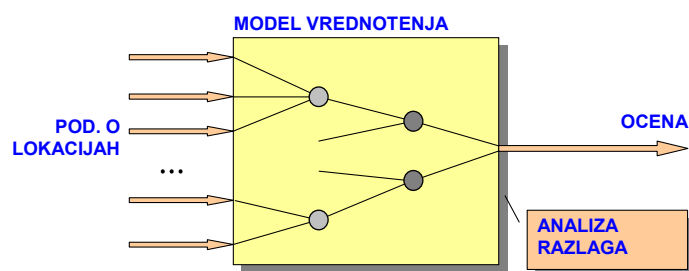
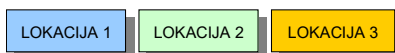
Goriške opekarne: lokacija glinokopa

Lokacije glinokopa

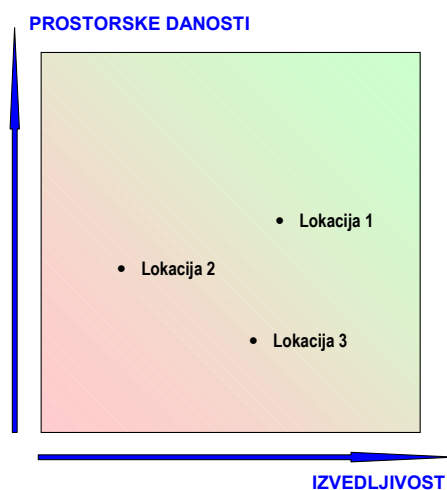


Vrednotenje glinokopov

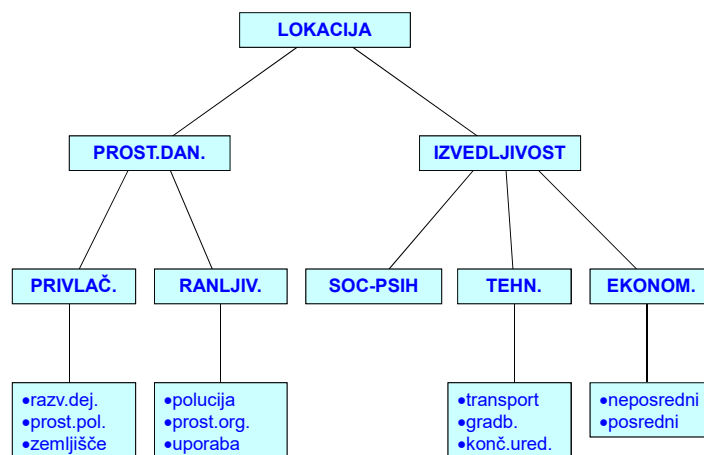
VARIANTE



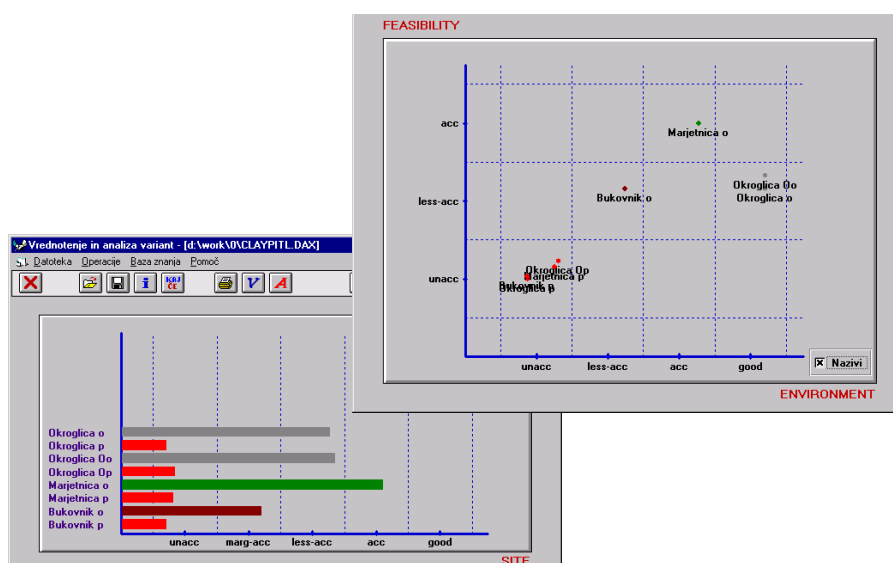
Vrednotenje glinokopov



Večkriterijski model vrednotenja



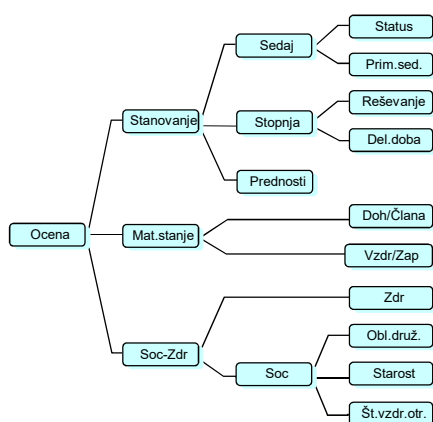
Vrednotenje lokacij



Dodeljevanje posojil

Dodeljevanje stanovanjskih posojil

Stanovanjski sklad Republike Slovenije

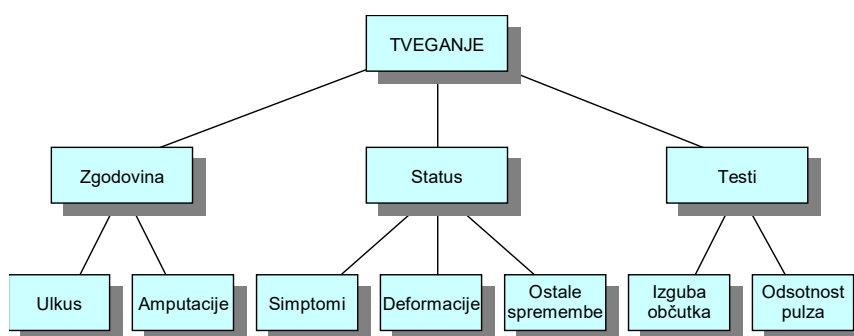


Ocenjevanje tveganja v zdravstvu

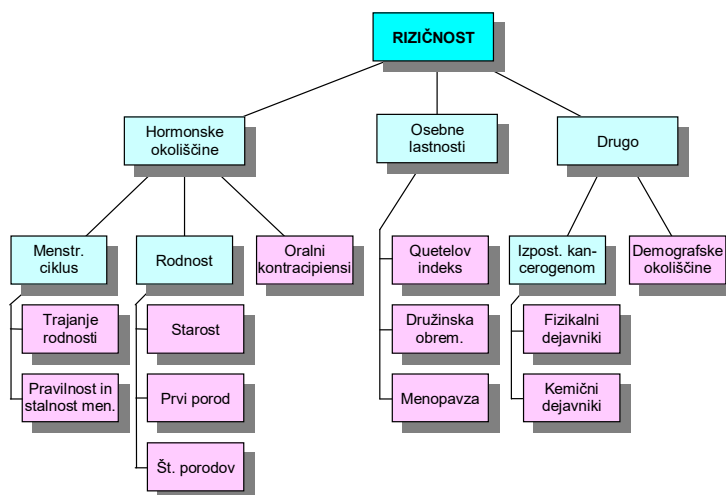
Marko Bohanec

Ocena tveganja pri diabetičnem stopalu

Večkriterijski model



Rak na dojki: ocena rizičnosti

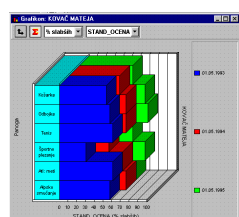
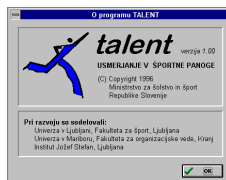


Usmerjanje v športne panoge

Usmerjanje v športne panoge



Sistem Talent



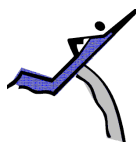
Tablica KOVAČ MATEJA

	01.05.1993	01.05.1994	01.05.1995
Ant. dolž. skoki	50,00	61,79	79,01
Ant. vz. dolga proga	67,55	62,08	79,01
Ant. meti	61,79	61,79	79,00
Ant. sprint	46,02	57,83	79,00
Ant. vz. skoki	61,79	65,54	79,01
Badminton	61,79	72,57	79,01
Sportna gimnastika	30,85	53,98	79,04
Kosarka	53,98	57,83	61,79
Novinarski testi	50,00	65,54	72,57
Ostalo	57,83	65,54	75,00
Plaz. dolga proga	69,15	61,79	79,04
Plaz. kratka proga	53,98	53,98	72,57
Sportno plezanje	30,85	46,02	79,00
Plaz. mešano	38,21	30,85	79,04

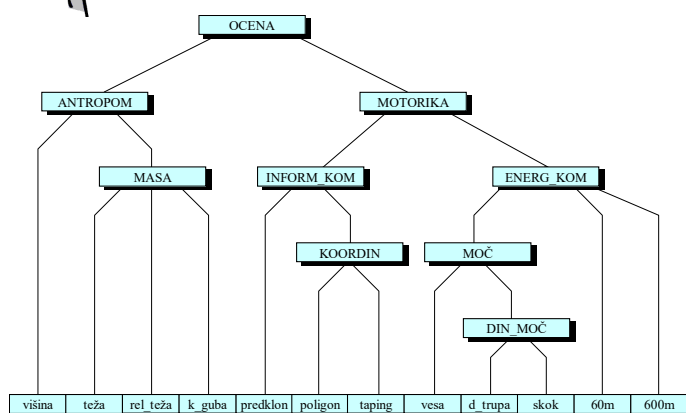
Košarka Model ID Datum meritev: 26.04.1996

ATRIBUT	test	uvelj	idm	id	ocena	opis
STAND. OCENA						79%
OCENA						50
ANTROPOM						60
višina	120,0	100	62	46	34	26
teža	60	50	51	42	34	26
rel. teža	21,5	40	82	46	36	22
koš. guba	8	20	79	55	21	82
MOTORIKA						79
INFORM. KOM						64
koordin	108	52	27	64	60	64
poligon	23,3	56	79	54	25	85
taping	21	62	79	50	26	60
ENERG. KOM						90
moč	1,22	86	13	90	100	100
DIN. MOČ						100
d. trupa	60	73	6	100	100	100
skok	150	60	79	73	6	100
60m	12,4	52	79	60	11	98
600m	241	20	79	43	36	42

Usmerjanje v športne panoge



Sistem Talent

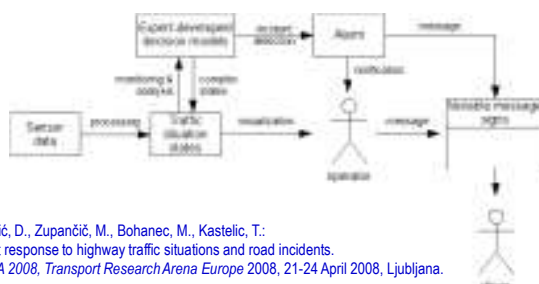


Krmiljenje in nadzorni sistemi

Avtocestni nadzorni center (Dragomelj)



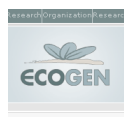
Avtocestni nadzorni center



Omerčević, D., Zupančič, M., Bohanec, M., Kastelic, T.:
Intelligent response to highway traffic situations and road incidents.
Proc. TRA 2008, Transport Research Arena Europe 2008, 21-24 April 2008, Ljubljana.

Podpora odločanju v kmetijstvu

EU projekti: Gensko spremenjeni organizmi



ECOGEN 2003-2006 <http://www.ecogen.dk/>
Soil ecological and economic evaluation of genetically modified crops

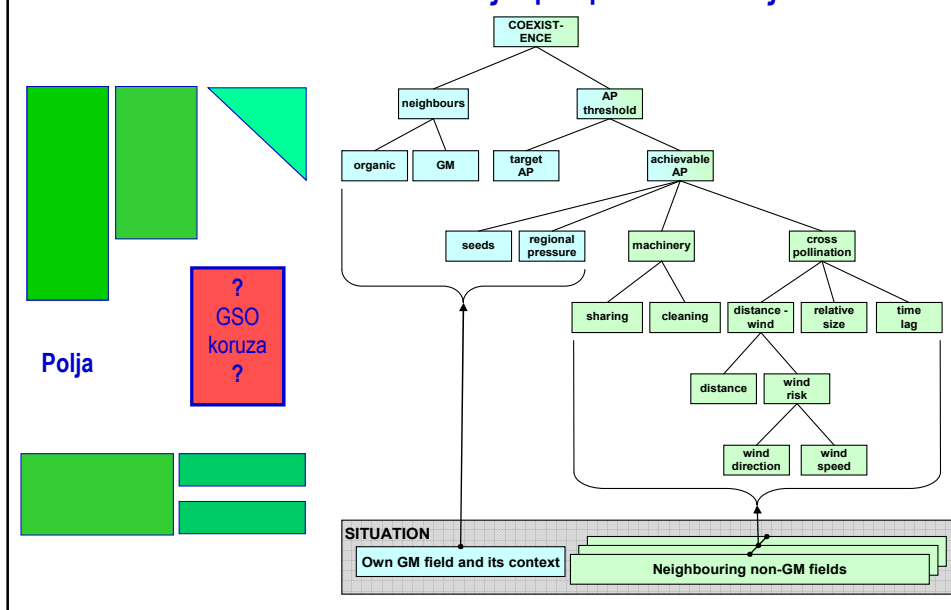


SIGMEA 2004-2007 <http://sigmea.dyndns.org/>
Sustainable introduction of genetically modified crops into European agriculture

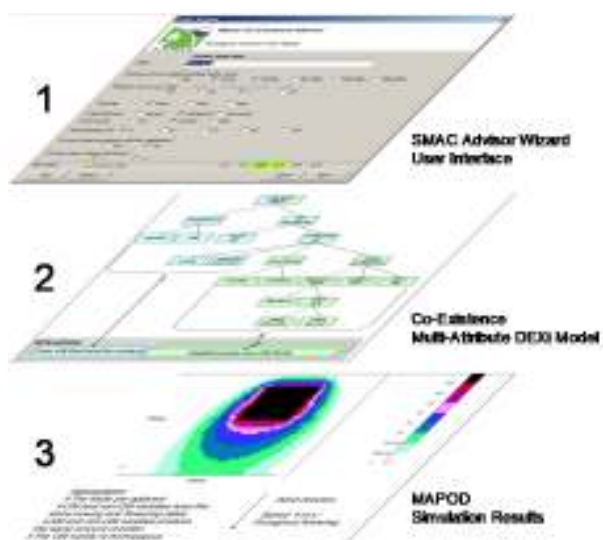


Co-Extra 2006-2009 <http://www.coextra.eu/>
Co-existence and traceability of GM and non-GM supply chains

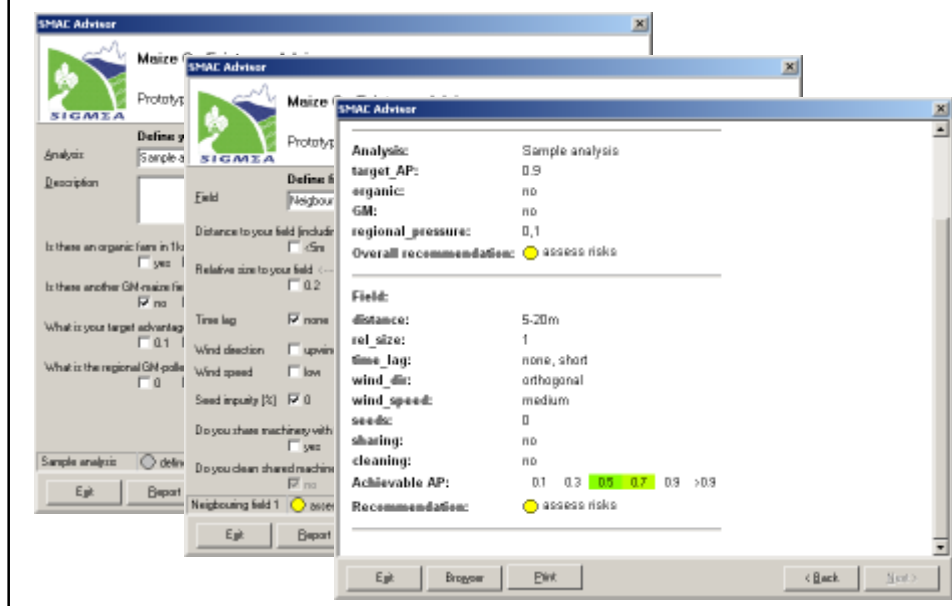
“SMAC Advisor”: Sožitje pri pridelovanju koruze



“SMAC Advisor”: Arhitektura sistema



“SMAC Advisor”: Arhitektura sistema

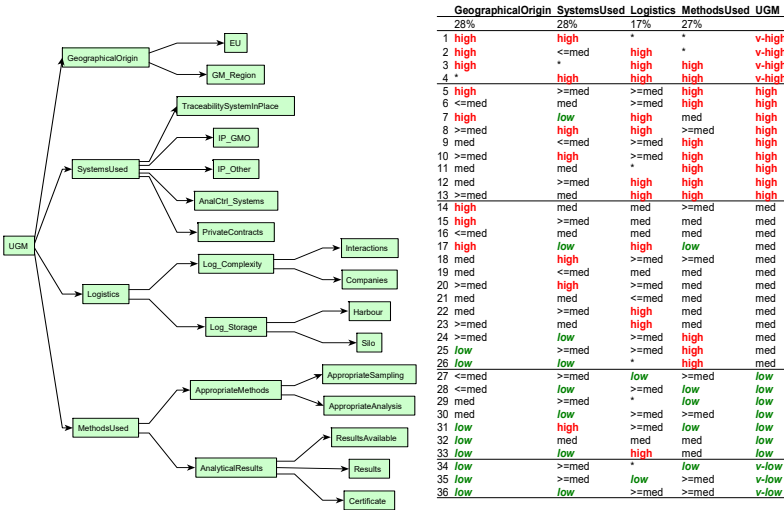


Vpliv na oblikovanje strategij EU

New case studies on the coexistence of GM and non-GM crops
in European agriculture
EUR 22102 EN

Non-GM field area	Flowering time-lag	Non-GM width	Cross-pollination rates											
			0.9%	0.8%	0.7%	0.6%	0.5%	0.4%	0.3%	0.2%	0.1%	0.05%	0.01%	
< 5 ha	0'day	0 m	100	100	100	100	100	100	150	200	300	X	X	
		9 m	20	20	20	20	20	20	20	20	20	20	20	
		18 m	20	20	20	20	20	20	20	20	20	20	20	
	30'days	0 m	20	20	20	20	20	20	20	20	200	300	X	
		9 m	0	0	0	0	0	0	0	0	0	20	200	
		12 m	0	0	0	0	0	0	0	0	0	20	150	
	60'days	0 m	0	0	0	0	0	0	0	0	0	0	0	
		9 m	0	0	0	0	0	0	0	0	20	100	150	
		12 m	0	0	0	0	0	0	0	0	0	20	150	
	90'days	0 m	0	0	0	0	0	0	0	0	0	20	150	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		12 m	0	0	0	0	0	0	0	0	0	0	0	
5 ha < x < 10 ha	0'day	0 m	20	20	20	20	20	20	20	20	20	20	20	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		18 m	0	0	0	0	0	0	0	0	0	0	0	
	30'days	0 m	0	0	0	0	0	0	0	0	0	0	0	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		12 m	0	0	0	0	0	0	0	0	0	0	0	
	60'days	0 m	0	0	0	0	0	0	0	0	0	0	0	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		12 m	0	0	0	0	0	0	0	0	0	0	0	
	90'days	0 m	0	0	0	0	0	0	0	0	0	0	0	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		12 m	0	0	0	0	0	0	0	0	0	0	0	
> 10 ha	0'day	0 m	20	20	20	20	20	20	20	20	20	20	20	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		18 m	0	0	0	0	0	0	0	0	0	0	0	
	30'days	0 m	0	0	0	0	0	0	0	0	0	0	0	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		12 m	0	0	0	0	0	0	0	0	0	0	0	
	60'days	0 m	0	0	0	0	0	0	0	0	0	0	0	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		12 m	0	0	0	0	0	0	0	0	0	0	0	
	90'days	0 m	0	0	0	0	0	0	0	0	0	0	0	
		9 m	0	0	0	0	0	0	0	0	0	0	0	
		12 m	0	0	0	0	0	0	0	0	0	0	0	

Odkrivanje nedovoljenih GSO na osnovi prometnih podatkov



Kok, E.J., Prins, T.W., Žnidaršič, M., Bohanec, M.: DSS modules on transportation (TM module) and on unapproved GMOs (UGM module). Co-Extra International Conference, 2-5.6.2009, Paris, France. 67-68, 2009.



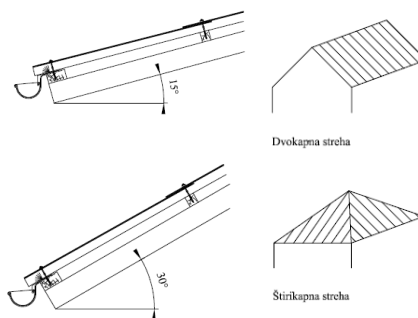
Vrednotenje strešnih kritin (v kontekstu)

Vrednotenje strešnih kritin

Strešne kritine



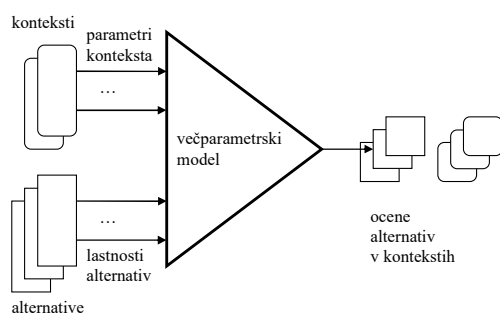
Kontekst



Marinič, S., Bohanec, M.: Večparametrsko vrednotenje variant v odvisnosti od konteksta: Model za vrednotenje strešnih kritin. 15. mednarodna konferenca Informacijska družba, IS 2012, 8.-12.10.2012, Ljubljana, 76-79, 2012.

Večparametrsko modeliranje in kontekst

Pristop s parametriziranjem konteksta



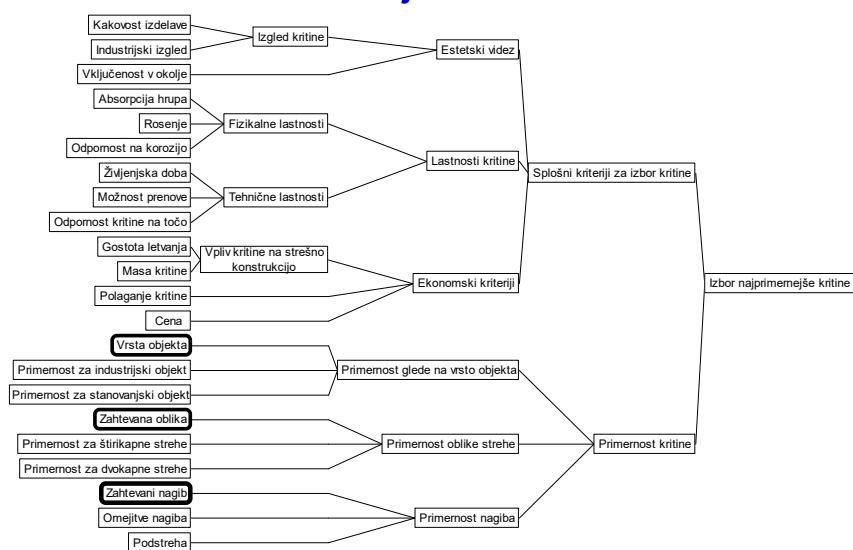
Prednosti

- eksplicitno modeliranje konteksta
- en sam model
- lažje vzdrževanje

Slabosti

- potrebno je zajeti tudi kontekst
- večji, zahtevnejši model

Večkriterijski model



Vrednotenje tehnologij za proizvodnjo električne energije

Kontić, B., Kontić, D., Zagorc, S., Matko, M., Dermol, U., Bohanec, M., Trdin, N. (2014):
Ocena vzdržnosti za razvoj energetike v Sloveniji do leta 2030 s poudarkom na jedrski tehnologiji, Knjiga 1,
IJS delovno poročilo DP-11583.

Kontić, B., Bohanec, M., Kontić, D., Trdin, N., Matko, M.: Improving appraisal of sustainability of energy options - A
view from Slovenia. *Energy Policy* 90, 154-171, 2016.

Bohanec, M., Trdin, N., Kontić, B.: A qualitative multi-criteria modelling approach to the assessment of electric
energy production technologies in Slovenia. *Central European Journal of Operations Research*, 1-15, 2016.

Metode vrednotenja

1. Model za vrednotenje posameznih tehnologij

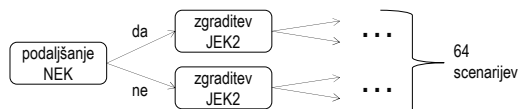
- Kvalitativni večkriterijski model
- Tehnologije: *hidro, premog, kurilno olje, plin, jedrska energija, bio, sončna, vetrna, (uvoz)*

2. Model za vrednotenje mešanic tehnologij

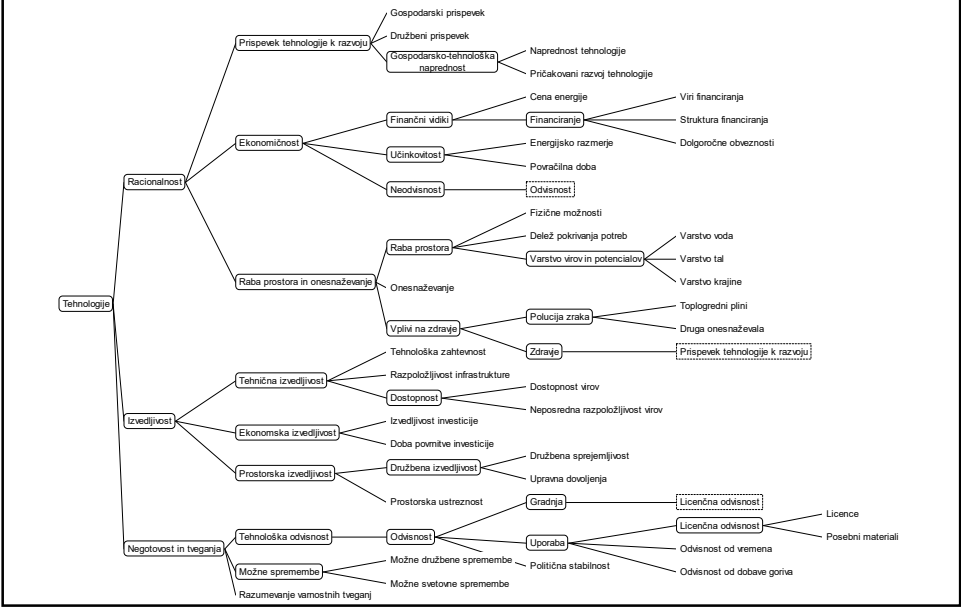
- Kvalitativni večkriterijski model
- Delež tehnologije v mešanici: instalirana moč
- Tehnologija prispeva k proizvedeni energiji skladno s svojo razpoložljivostjo (letnim obratovalnim časom).

3. Vrednotenje scenarijev

- Vrednotenje mešanic v obdobju 2013–2050
- Upoštevajoč dogodke



1. Vrednotenje posameznih tehnologij



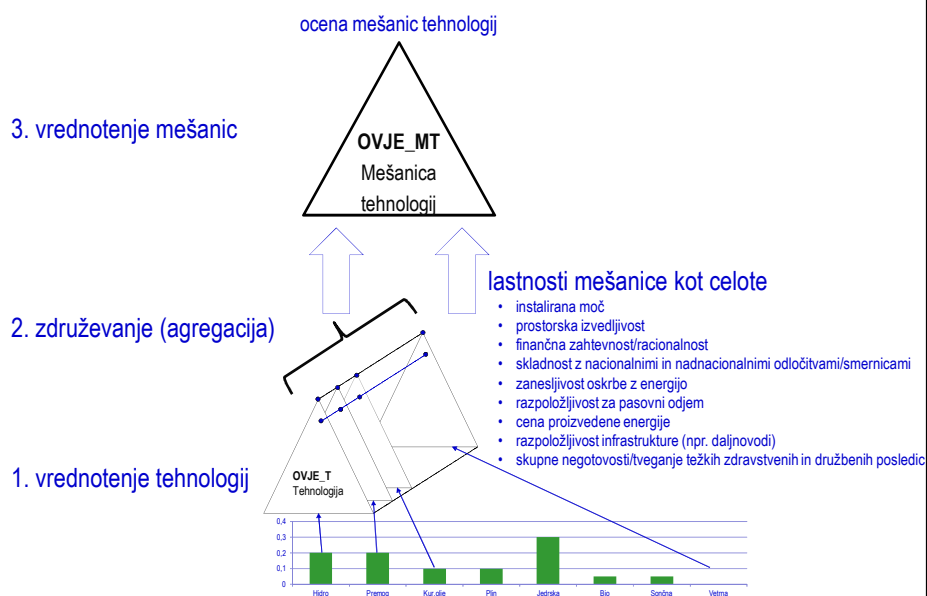
Rezultati vrednotenja tehnologij

Kriterij	Hidro	Hidro	Prepomp	Prepomp	Kur zija	Kur zija	Plin	Plin	Jedrsko	Jedrsko	Bio	Sonca	Sonca	Vetro	Vetro	Uvo
Tehnologije	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Racionalnost																
Prirpvek tehnologije k razvoju	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Gospodarski prispevek	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Družbeni prispevek	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Gospodarsko-tehnološka naprednost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Ekonomičnost																
Cena energije	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Financiranje	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Učinkovitost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Neodvisnost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Raba prostora in onesnaževanje																
Onesnaževanje	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Raba prostora	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Fizične možnosti	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Delež pokrivanja potreb	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Varstvo virov in potencialov	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Polucija zraka	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Zdravje	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Izvedljivost																
Tehnična izvedljivost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Razpoložljivost infrastrukture	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Dostopnost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Ekonomska izvedljivost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Izvedljivost investicije	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Doba povrnitve investicije	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Prostorska izvedljivost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Družbena sprejemljivost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Uprava dovoljenja	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Negotovitost in tveganja																
Tehnološka odvisnost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Odvisnost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Uporaba	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Licenčna odvisnost	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Odvisnost od vremena	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Odvisnost od dobave goriv	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Možne spremembe	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj
Razumevanje varnostnih tveganj	manj usti	zelo usti	manj	manj	manj	manj	zelo usti	zelo usti	zelo usti	zelo usti	manj	manj	manj	manj	manj	manj

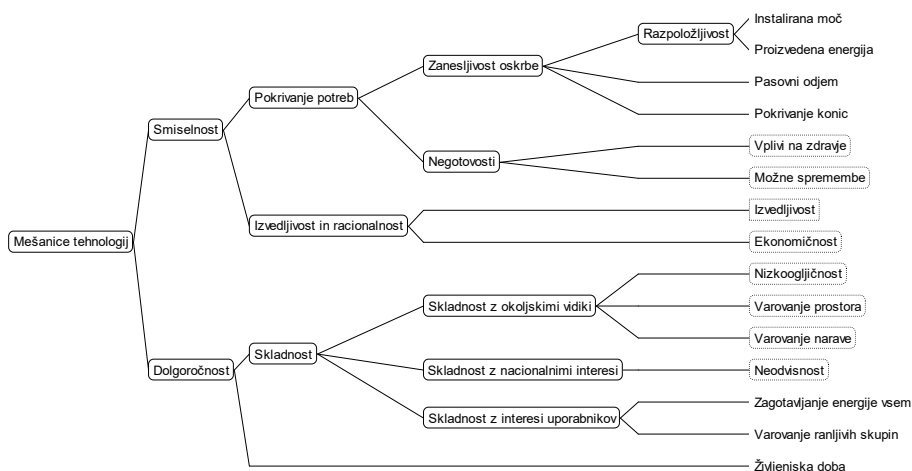
Rezultati vrednotenja tehnologij

Hidro:	manj ustr – zelo ustr
Premog:	neustr
Kur.olje:	neustr
Plin:	še ustr – ustr
Jedrska:	še ustr – zelo ustr
Bio:	neustr
Sončna:	neustr
Vetрна:	neustr
Uvoz:	neustr

2. Vrednotenje mešanic tehnologij



2. Vrednotenje mešanic tehnologij



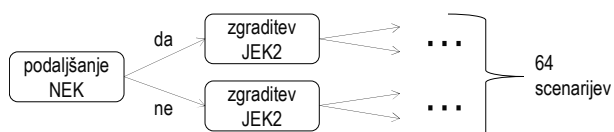
3. Vrednotenje scenarijev

Scenarij: Časovni potek odločanja oz. izvedbe rešitev

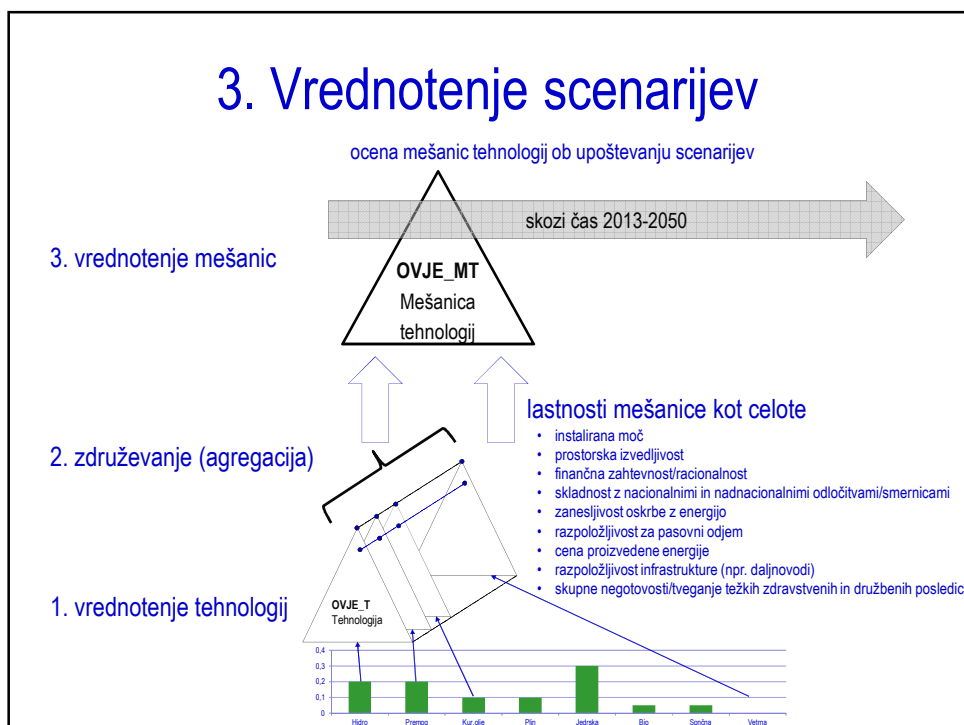
Scenarij je opredeljen z zaporedjem dogodkov

Dogodek: Realizacija enega od dveh možnih izidov

Dogodek	Leto
Ustavitev TEŠ5 2027 (namesto 2023)	2027
Ne podaljšamo NEK	2023
Zgraditev JEK2	2025
HE Srednja Sava	2035
HE Spodnja Sava	2025
Plinske elektrarne	2025

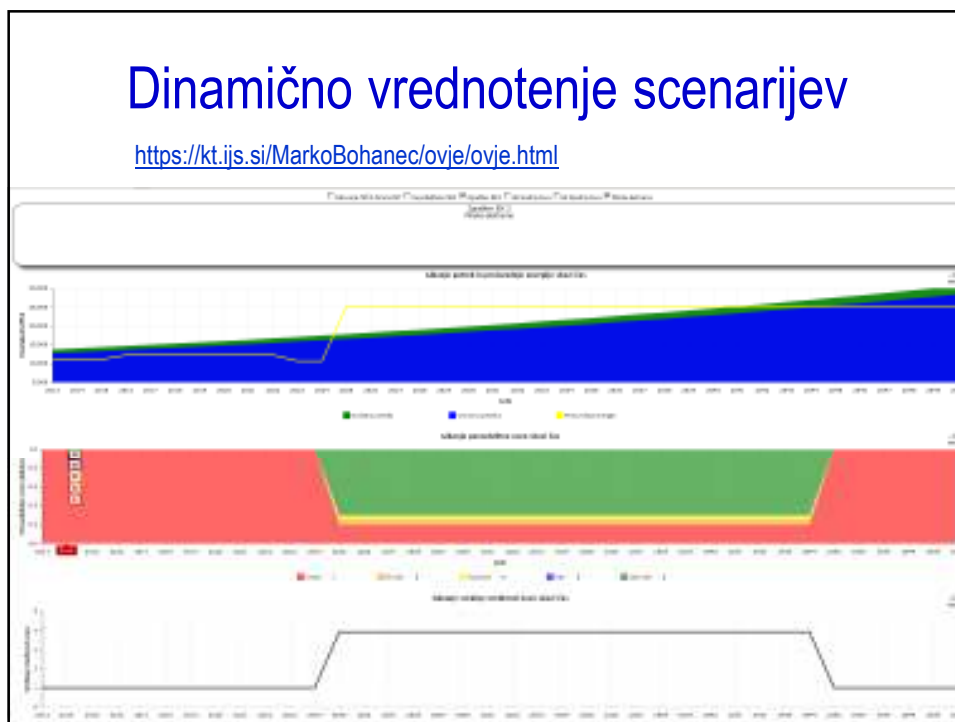


3. Vrednotenje scenarijev



Dinamično vrednotenje scenarijev

<https://kt.ijs.si/MarkoBohanec/ovje/ovje.html>



Sprememba terapije pri parkinsonovi bolezni

Marko Bohanec, et al. (2018) A decision support system for Parkinson disease management: Expert models for suggesting medication change, *Journal of Decision Systems*, 27:sup1, 164-172, DOI: 10.1080/12460125.2018.1469320
Mileva Boshkoska, et al.: Decision support for medication change of Parkinson's disease patients. *Computer Methods and Programs in Biomedicine* 196, 105552., 2020.

Projekt PD_manager



PD_manager: *mHealth platform for Parkinson's disease management*

Projekt Evropske skupnosti, program Horizon 2020



Trajanje: 2015-2018

Sodeluje 11 partnerjev iz Italije, Grčije, Velike Britanije, Španije, Nemčije in Slovenije

Koordinator:

Institut Jožef Stefan, Odsek za tehnologije znanja
dr. Dragana Miljković



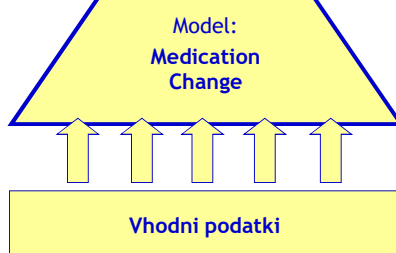
Druga dva slovenska partnerja:

Institut Jožef Stefan, Odsek za računalniške sisteme
Univerzitetni rehabilitacijski institut RS - Soča

Modeli za svetovanje o spremembi terapije

Spremeniti: Da/Ne?  Kako spremeniti?

- povečati/zmanjšati odmerek
- zamenjati zdravilo A z B
- dodati/odvzeti zdravilo C



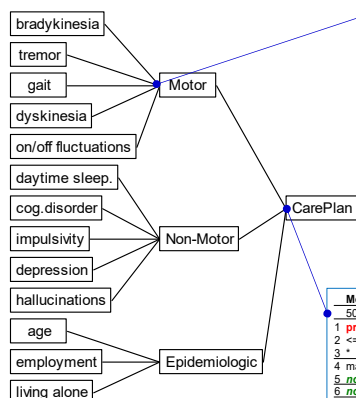
Vhodni podatki:

Vsi podatki o pacientu, ki so na voljo v sistemu PD_manager v določeni časovni točki.

Pretežno so to obdelani podatki o simptomih in njihovi zgodovini.

Odločitvena pravila: Model B

Struktura



Odločitvena pravila

	bradykinesia	tremor	gait	dyskinesia	on/off fluctuations	Epidemiologic	Motor
1	19%	19%	24%	13%	15%	10%	problematic
2	problematic	problematic	*	<=problematic	*	*	problematic
3	problematic	*	*	*	problematic	*	problematic
4	problematic	*	*	*	*	*	problematic
5	*	problematic	*	<=problematic	*	*	problematic
6	*	problematic	*	*	problematic	*	problematic
7	*	problematic	*	*	*	active	problematic
8	*	*	problematic	*	*	*	problematic
9	*	*	*	severe	*	*	problematic
10	*	*	*	*	problematic	active	problematic
11	problematic	normal	normal	normal	normal	passive	maybe
12	normal	problematic	normal	normal	normal	passive	maybe
13	normal	normal	normal	problematic	*	passive	maybe
14	normal	normal	normal	>=problematic	problematic	passive	maybe
15	normal	normal	normal	problematic	normal	*	maybe
16	normal	normal	normal	normal	normal	*	normal

	Motor	Non-Motor	Epidemiologic	CarePlan
1	50%	50%	0%	problematic
2	problematic	*	*	change
3	<=maybe	<=maybe	*	change
4	*	problematic	*	change
5	maybe	normal	*	maybe
6	normal	maybe	*	maybe
7	normal	normal	*	no change

Uporaba modelov

Kot opozorilo,
oznaka



Z razlago: pregledovanje v globino

Attribute	Model A	Model B	Model C
CarePlan	maybe	change	change
Motor	maybe	problematic	problematic
bradykinesia	normal	normal	normal
tremor	normal	normal	normal
gait	problematic	problematic	problematic
dyskinesia	problematic	problematic	problematic
on/off fluctuations	normal	normal	normal
Epidemiologic	[not used]	passive	passive
Non-Motor	normal	problematic	problematic
daytime sleep.	normal	normal	normal
cog. disorder	normal	normal	normal
impulsivity	normal	normal	normal
depression	problematic	problematic	problematic
hallucinations	normal	normal	normal
Epidemiologic	[not used]	passive	passive
Epidemiologic	passive	passive	passive
Epidemiologic	passive	passive	passive
age	older	older	older
employment	unemployed	unemployed	unemployed
living alone	no	no	no
disease duration	[not used]	long	long

Informacijski sistem za zdravnika



Podpora odločanju pri resnih nezgodah v nuklearnih elektrarnah

Bohanec, M., Vrbanić, I., Bašić, I., Delalak, K., Štrubelj, L.: A decision-support approach to severe accident management in nuclear power plants. *Journal of Decision Systems*, 2020.

Prototipni program Severa

A DSS for Severe Accident Management in Nuclear Power Plants



Interpretacija, diagnostika, napovedovanje

[illegible]

Eden od modelov DEX v Severi

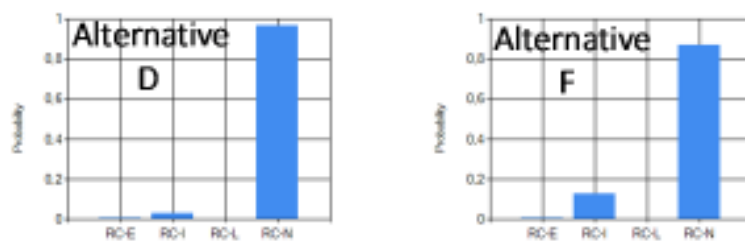
	Description	Scale
Environment & Acoustic Parameters		
Acoustic		
ISO 9612-1 Acoustic Program: Without operator action		
Re: suitable for determining barrier classes		
Core		
CoreState	Core State	CD or CK CD, CK, REC, OK
CoreType	Chattering Children	yes/no
CoreType1200	Duration of CEST = 1000 ms(±) 100ms	yes/no
CoreType1500	RPV = 100%	yes/no
CoreType1800	Duration of CEST = 1000 ms(±) 100ms	yes/no
CoreType2100	RPV = 100%	yes/no
CoreType2400	Core State	yes/no
CoreType2700	CEST = 254 ms(±)	yes/no
CoreType3000	Duration of CEST = 1000 ms(±) 100ms	yes/no
CoreType3300	Core Progression	yes/no
CoreType3600	Progression: Core Damage	yes/no
CoreType3900	Progression: Containment Challenge	yes/no
CoreType4200	Progression: Core Damage	yes/no
CoreType4500	Progression: Core Damage	yes/no
CoreType4800	Progression: Core Damage	yes/no
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CoreType81900	Progression: Core Damage	yes/no
CoreType82200	Progression: Core Damage	yes/no
CoreType82500	Progression: Core Damage	yes/no
CoreType82800	Progression: Core Damage	yes/no
CoreType83100	Progression: Core Damage	yes/no
CoreType83400	Progression: Core Damage	yes/no
CoreType83700	Progression: Core Damage	yes/no
CoreType84000	Progression: Core Damage	yes/no
CoreType84300	Progression: Core Damage	yes/no
CoreType84600	Progression: Core Damage	yes/no
CoreType84900	Progression: Core Damage	yes/no
CoreType85200	Progression: Core Damage	yes/no
CoreType85500	Progression: Core Damage	yes/no
CoreType85800	Progression: Core Damage	yes/no
CoreType86100	Progression: Core Damage	yes/no
CoreType86400	Progression: Core Damage	yes/no
CoreType86700	Progression: Core Damage	yes/no
CoreType87000	Progression: Core Damage	yes/no
CoreType87300	Progression: Core Damage	yes/no
CoreType87600	Progression: Core Damage	yes/no
CoreType87900	Progression: Core Damage	yes/no
CoreType88200	Progression: Core Damage	yes/no
CoreType88500	Progression: Core Damage	yes/no
CoreType88800	Progression: Core Damage	yes/no
CoreType89100	Progression: Core Damage	yes/no
CoreType89400	Progression: Core Damage	yes/no
CoreType89700	Progression: Core Damage	yes/no
CoreType90000	Progression: Core Damage	yes/no
CoreType90300	Progression: Core Damage	yes/no
CoreType90600	Progression: Core Damage	yes/no
CoreType90900	Progression: Core Damage	yes/no
CoreType91200	Progression: Core Damage	yes/no
CoreType91500	Progression: Core Damage	yes/no
CoreType91800	Progression: Core Damage	yes/no
CoreType92100	Progression: Core Damage	yes/no
CoreType92400	Progression: Core Damage	yes/no
CoreType92700	Progression: Core Damage	yes/no
CoreType93000	Progression: Core Damage	yes/no
CoreType93300	Progression: Core Damage	yes/no
CoreType93600	Progression: Core Damage	yes/no
CoreType93900	Progression: Core Damage	yes/no
CoreType94200	Progression: Core Damage	yes/no
CoreType94500	Progression: Core Damage	yes/no
CoreType94800	Progression: Core Damage	yes/no
CoreType95100	Progression: Core Damage	yes/no
CoreType95400	Progression: Core Damage	yes/no
CoreType95700	Progression: Core Damage	yes/no
CoreType96000	Progression: Core Damage	yes/no
CoreType96300	Progression: Core Damage	yes/no
CoreType96600	Progression: Core Damage	yes/no
CoreType96900	Progression: Core Damage	yes/no
CoreType97200	Progression: Core Damage	yes/no
CoreType97500	Progression: Core Damage	yes/no
CoreType97800	Progression: Core Damage	yes/no
CoreType98100	Progression: Core Damage	yes/no
CoreType98400	Progression: Core Damage	yes/no
CoreType98700	Progression: Core Damage	yes/no
CoreType99000	Progression: Core Damage	yes/no
CoreType99300	Progression: Core Damage	yes/no
CoreType99600	Progression: Core Damage	yes/no
CoreType99900	Progression: Core Damage	yes/no
CoreType100200	Progression: Core Damage	yes/no
CoreType100500	Progression: Core Damage	yes/no
CoreType100800	Progression: Core Damage	yes/no
CoreType101100	Progression: Core Damage	yes/no
CoreType101400	Progression: Core Damage	yes/no
CoreType101700	Progression: Core Damage	yes/no
CoreType102000	Progression: Core Damage	yes/no
CoreType102300	Progression: Core Damage	yes/no
CoreType102600	Progression: Core Damage	yes/no
CoreType102900	Progression: Core Damage	yes/no
CoreType103200	Progression: Core Damage	yes/no
CoreType103500	Progression: Core Damage	yes/no
CoreType103800	Progression: Core Damage	yes/no
CoreType104100	Progression: Core Damage	yes/no
CoreType104400	Progression: Core Damage	yes/no
CoreType104700	Progression: Core Damage	yes/no
CoreType105000	Progression: Core Damage	yes/no
CoreType105300	Progression: Core Damage	yes/no
CoreType105600	Progression: Core Damage	yes/no
CoreType105900	Progression: Core Damage	yes/no
CoreType106200	Progression: Core Damage	yes/no
CoreType106500	Progression: Core Damage	yes/no
CoreType106800	Progression: Core Damage	yes/no
CoreType107100	Progression: Core Damage	yes/no
CoreType107400	Progression: Core Damage	yes/no
CoreType107700	Progression: Core Damage	yes/no
CoreType108000	Progression: Core Damage	yes/no
CoreType108300	Progression: Core Damage	yes/no
CoreType108600	Progression: Core Damage	yes/no
CoreType108900	Progression: Core Damage	yes/no
CoreType109200	Progression: Core Damage	yes/no
CoreType109500	Progression: Core Damage	yes/no
CoreType109800	Progression: Core Damage	yes/no
CoreType110100	Progression: Core Damage	yes/no
CoreType110400	Progression: Core Damage	yes/no
CoreType110700	Progression: Core Damage	yes/no
CoreType111000	Progression: Core Damage	yes/no
CoreType111300	Progression: Core Damage	yes/no

Severa

A DSS for Severe Accident Management in Nuclear Power Plants



Vrednotenje alternativ (aktivnosti za zmanjšanje posledic nesreče)



RC-E: Early release (hours)
RC-I: Intermediate (~ 1 day)
RC-L: Late (several days)
RC-N: Long-term concern

Izkušnje (1/2)

- DEXi se je uveljavil za pomoč pri odločanju na številnih področjih doma in v tujini ...
- ... in pri izobraževanju na gimnazijah in univerzah.
- Kaj ponuja?
 - modeli vrednotenja, razviti na osnovi ekspertnega znanja, kjer prevladuje presoja
 - preprostost, "lahkotnost", relativno hiter razvoj modelov
 - možnost integracije različnih področij (npr. ekologija in ekonomija)
 - podpira komuniciranje med eksperti
 - rezultat razvoja modelov: *eksplicitno formulirano znanje* s problemskega področja ter možnost *vrednotenja* in *analize* odločitvenih alternativ
 - možnost realizacije orodij (sistemov) za podporo pri odločanju (namenski programi, spletne storitve)

Izkušnje (2/2)

- Slabosti, pasti, problemi:
 - modeli so kvalitativni, torej tudi nenatančni, približni
 - možna je (pre)slaba ločljivost modela
 - "plitva" (vzročno-posledična) pravila, brez globljih zakonitosti modeliranega sistema
- Omejitve programa DEXi: (izboljšave DEXiWin)
 - težavno obravnavanje pravih hierarhičnih modelov
 - slabše podprto povezovanje z zbirkami podatkov
 - podpira le kvalitativne spremenljivke, ne pa tudi numeričnih
 - omejitve pri izražanju nepopolnega in nenatančnega znanja oz. podatkov (npr. verjetnostne porazdelitve)
- Potrebe po razširitvi metodologije ter razvoju splošnih in namenskih orodij