Knowledge Crystallization

Card, Mackinlay, Shneiderman (1999), "Information Visualization",
Introduction to "Readings in Information Visualization: Using Vision to Think"

Knowledge crystallization

The process of:

- wanting to find out some information (your task)
- looking at all the data you can find relating to the task
- creating a schema/framework to describe the data
- packaging it so that it can be communicated to others
- … and using it to solve your task

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The Knowledge Crystallization process, CMS p10, edited

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She can then present this information to her colleagues in a way that **shows the insight that she herself has gained during this process**

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	New Dell Inspiron Black	HUAWEI MateBook D	HP 15-dw1004na	Lenovo V15 ADA 15.6" Full HD Laptop	Lenovo IdeaPad	Lenovo V15 ADA
Price	£524.00	£599.99	£435.23	£399.00	£529.93	£524.40
Sold By	COMPSOLUK	Amazon.co.uk	Amazon Warehouse	MESH Computers	TEKshop	Techno world Plc
Computer Memory Size	8 GB	8 GB	8 GB	8 GB	8 GB	8 GB
Connectivity Technology	Bluetooth; USB; HDMI; Wi-Fi	Bluetooth; Wi-Fi; USB	Bluetooth; Ethernet; HDMI; USB; Wi-Fi	—	—	Wi-Fi
CPU Model	Ryzen 5 3500U	Ryzen 5 3500U	Core i3	Athlon	Core i5 Family	R Series
CPU Model Manufacturer	AMD	AMD	Intel	AMD	Intel	AMD
CPU Speed	3.7 GHz	3.4	2.1 GHz	2.4 GHz	1 GHz	2.6 GHz
Item Weight	2 kg	1.53 kg	2 kg	0 grammes	1.7 kg	2.1 kg
Screen Size	15.6 in	15.6 in	15.6 in	15.6 in	15.6 in	15.6 in
Display Technology	LED	—	—	—	—	—
Resolution	1080p	1920 x 1080	1080p	1920 x 1080	1920 x 1080	1920 x 1080
Hard Disk Description	Flash Memory Solid State	Flash Memory Solid State	Flash Memory Solid State	SSD	SSD	SSD
Hard Disk Size	256 GB	256 GB	—	256 GB	256 GB	256 GB
Operating System	Windows 10	Windows 10 Home	Windows 10 Home	Windows 10 Home	Windows 10 S	Windows 10 Home
Processor Count	1	1	2	2	4	2
Processor Description	AMD Ryzen	AMD R5, Win 10 Home	Intel Core	AMD Athlon	Intel Core i5 10th Gen	AMD Ryzen
RAM Type	DDR4 SDRAM	DDR4 SDRAM	DDR4 SDRAM	DDR4 SDRAM	DDR4 SDRAM	DDR SDRAM

https://www.amazon.co.uk/dp/B08NQ1VX6Z/ (08/07/21)

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He realises that the race dates are an important attribute, and so changes his schema to a timetable representation, where the number of days between each race is clearly seen

This makes it easier to find a sensible schedule through the summer that identifies the races he will take part in.

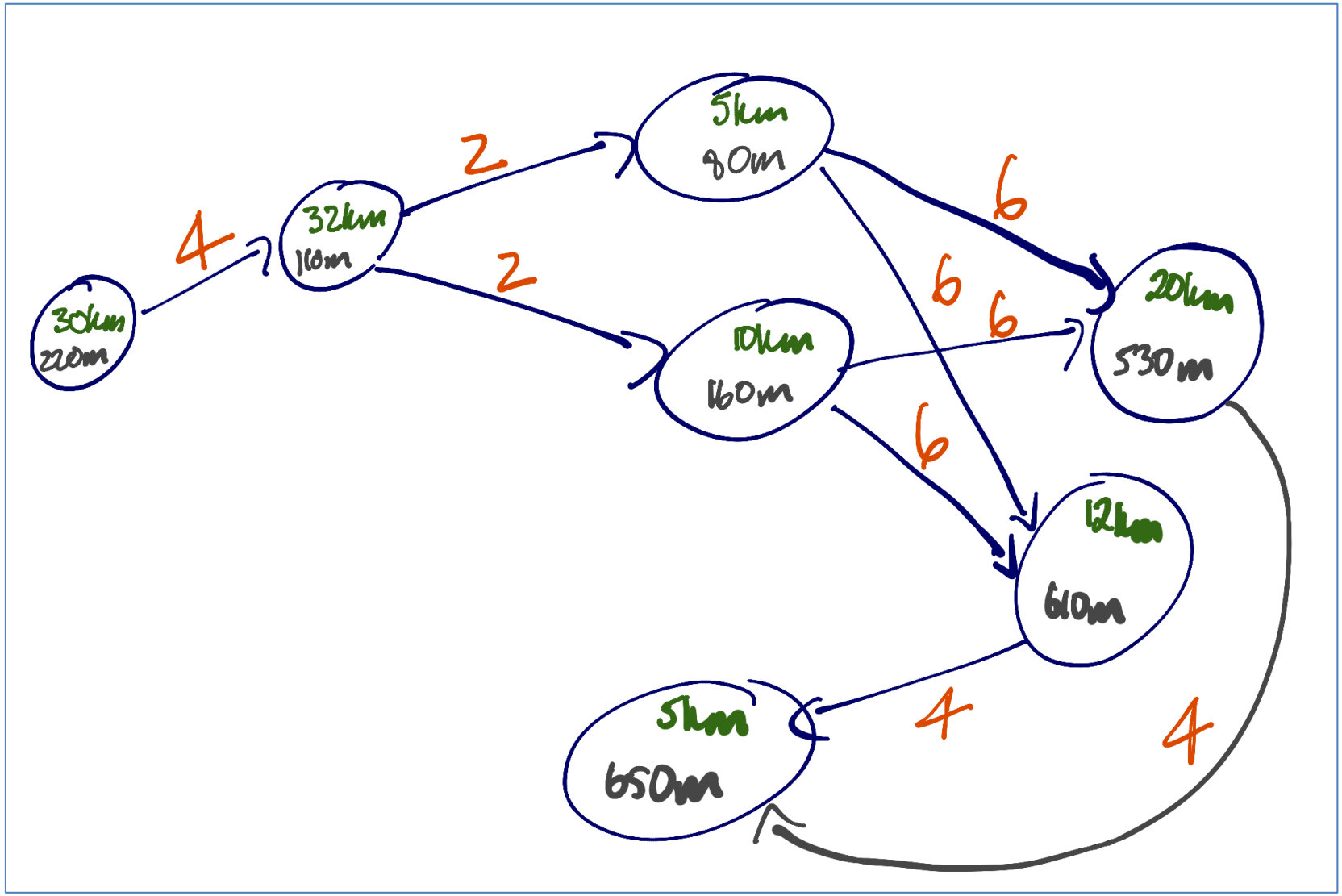
John's first schema

	distance	climb	cost	route	date
A	30km	220m	£10	P2P	4 June
B	12km	610m	£15	loop	16 June
C	5km	650m	£5	P2P	20 June
D	32km	110m	£7	loop	8 June
Ea	5km	80m	£8	loop	10 June
Eb	10km	160m	£10	loop	10 June
F	20km	530m	£12	loop	16 June

John's second schema

4	5	6	7	8	9	10	11	12	13
A (30km,220m)				D (32km,110m)		Ea (5km,80m) Eb (10km,160m)			
14	15	16	17	18	19	20	21	22	23
		F (20km,530m) B (12km,610m)				C (5km, 650m)			

John's third schema



The steps of Knowledge Crystallization

1. Forage for information/data
2. Create schema – the framework for holding the information
3. Instantiate the schema by putting the information in it
    a. solve the problems that emerge: change or extend schema, add or remove information
    b. manipulate the schema to reveal insight about the information gathered along the way
    c. repeat until the most effective and efficient schema is found
4. Present the information to others, using the best schema
5. Use it to solve your task

Requirements for Knowledge Crystallization:

data, task, existing or potential schema

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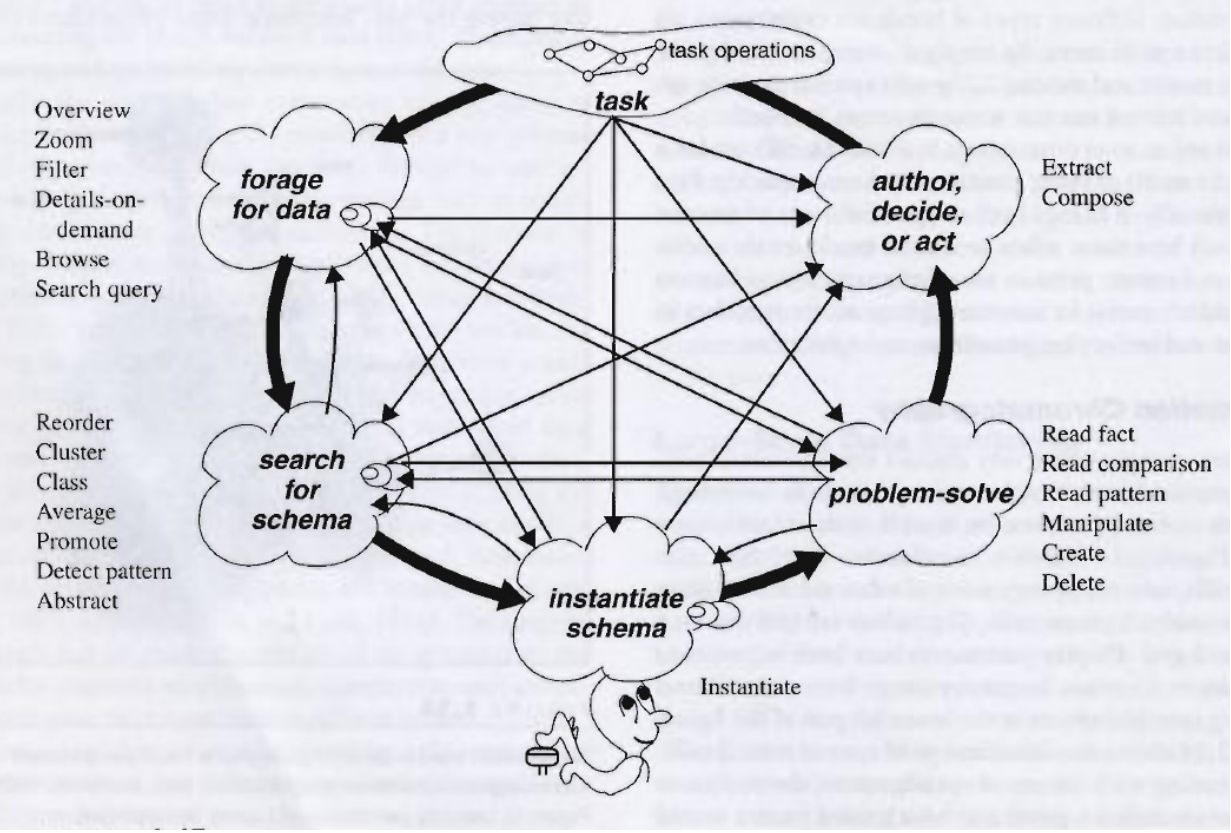
Knowledge crystallisation



Information Visualisation can support all stages

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