

# From flipchart to glossy visualization through collaboration and d3.js

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ORGANISATION EUROPÉENNE POUR LA RECHERCHE NUCLEAIRE  
CERN EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH

Action to be taken

Vote Procedure

For Information:	FINANCE COMMITTEE 67 <sup>th</sup> Meeting 19 March 2014	
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KNOWLEDGE TRANSFER AT CERN  
REPORT ON 2013 ACTIVITIES



# KNOWLEDGE TRANSFER 2011



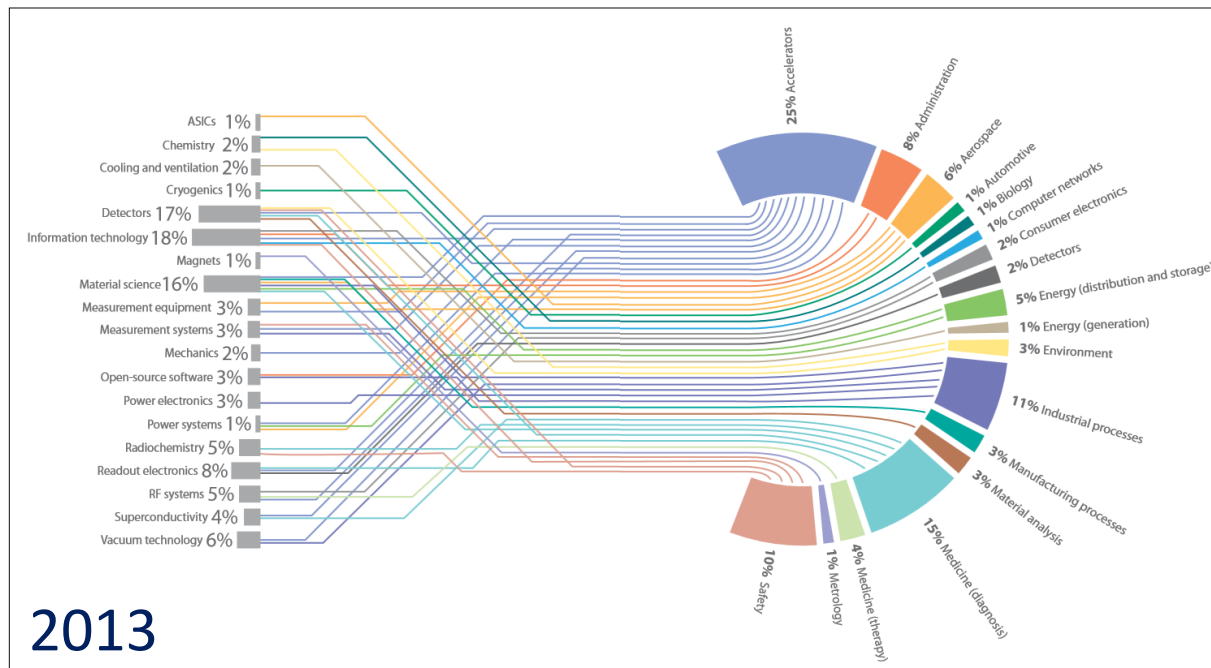
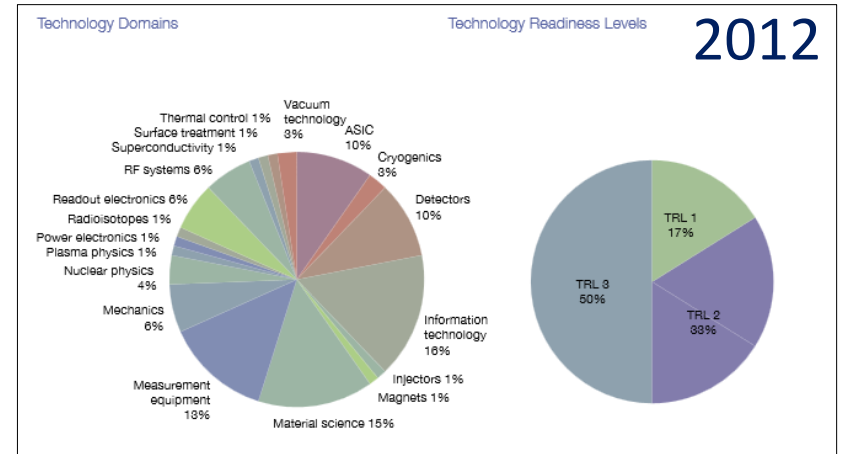
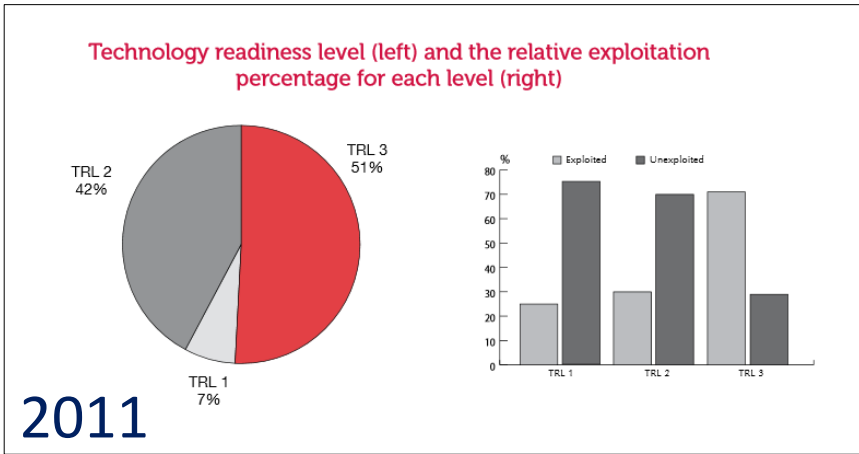
Knowledge Transfer **2012**



Knowledge Transfer **2013**



# Data Visualization



Internal Reference		Assigned KTO	Support KTO	Technical Contact	Originator Department	Originator Group	External Partner	Year	Type	Status
3M collaboration - internal coolants		KTFP-2015-01	N. Ziogas	T. Baron, P. Ferreira	IT	CIS	University of Montpellier	2015	KTF	UASS
2 KT- Fund Fostering Global Cooperation through Indico		KTFP-2015-02	E. Chesta	M. Brugger	EN	STI	Institute of Plasma Physics, Turno	2015	KTF	UASS
3 Celesta - A CubSat Demonstrator for RadMon and CHARM applications		KTFP-2015-03	E. Del Castillo	J. Devine	EN	MEF	Politecnico Di Milano, Italy	2015	KTF	UASS
1 Emergency Lighting Power Converter		KTFP-2015-04	Z. Lawson	A. Henriques	DGS	SEE	KIT, Germany	2015	KTF	UASS
3 3D Multiline Interferometry KT Fund Project		KTFP-2015-05	Z. Lawson	J.C. Gayde	BE	ABP	TRIUMF, Canada	2015	KTF	UASS
3 Kryolize KT Fund project		KTFP-2015-08	Z. Lawson	A. Lombardi	BE	ABP	GSI, Germany	2015	KTF	UASS
3 Design of a linear accelerator for light ions to inject into LEAR		KTFP-2015-09	T. Tsardati	F. Wenander	DGS	RP	DAES, SA, Switzerland	2015	ITD	UASS
2 Electron gun for EBIS injector		KTFP-2015-10	Z. Lawson	M.Silari	DGS	SEE	ELSE Nuclear, Italy	2015	ITD	UASS
2 RaDoM radon detector		KTFP-2015-11	Z. Lawson	A.Henriques	DGS	SEE	Technical University of Liberec, Cz	2015	ITD	UASS
2 Kryolize, to KIT		KTFP-2015-12	Z. Lawson	A.Henriques	EN	STI	University of Houston, USA	2015	ITD	UASS
2 Kryolize, to TRIUMF		KTFP-2015-13	Z. Lawson	M.Vagnoni, T.Stora	DGS	RP	ESRF, France	2015	ITD	UASS
2 Remote Handling System (MEDICIS), to DAES		KTFP-2015-14	Z. Lawson	M.Silari	EN	MEF	Oxford nanoSystems, UK	2015	ERS	UASS
2 B-RAD, to ELSE-Nuclear		KTFP-2015-15	Z. Lawson	J.C. Gayde	TE	UIS	Arktis Radiation Detectors Ltd., Sw	2015	ITD	UASS
3 STFC-CERN BIC request from Oxford nanoSystems		KTFP-2015-16	Z. Lawson	S.Izquierdo	PH	RP	Chiyoda Technol Corporation, AIS	2015	ITD	UASS
3 NINO32 for Neutron Detection		KTFP-2015-17	Z. Lawson	K.Johnston	DGS	ESE	X Ray Imatek, Spain	2015	ITD	UASS
2 Monitoring of radioactive waste at CERN		KTFP-2015-18	E. Del Castillo	M.Silari	PH	ESE	University of Illinois, United State	2015	ITD	UASS
2 Production license on Medipix3		KTFP-2015-19	E. Del Castillo	P.Petagna	PH	ESE	Samway Electronic S.R.L., Romania	2015	ITD	UASS
2 License on Scalable Readout System		KTFP-2015-20	E. Del Castillo	Michael Campbell, Cri	PH	DT	WIDEPIX, Czech Republic	2015	ITD	UASS
4 Production license on Medipix3		ERS-2015-21	E. Del Castillo	Michael Campbell	PH	AIO	CEA, CNRS, France	2015	ERS	UASS
3 SAMPET		ERS-2015-22	E. Del Castillo	Eraldo Oliveri	PH	CMX	Radiation Monitoring Devices Inc.	2015	ERS	UASS
3 Photonic crystals for homeland security		ERS-2015-23	E. Del Castillo	Michael Campbell	PH	ESE	Amsterdam Scientific Instruments	2015	ERS	UASS
4 Production license on Medipix3		ERS-2015-24	E. Del Castillo	Crispin Williams	PH	ESE	INFN, Italy	2015	ERS	UASS
4 R&D license on Timepix3		ERS-2015-25	E. Del Castillo	Michael Campbell	PH	ESE	WIDEPIX, Czech Republic	2015	ERS	UASS
4 R&D license for educational purposes		ERS-2015-26	E. Del Castillo	Etiennette Hillemanns	PH	ESE	NSRL (Hefei)	2015	ERS	UASS
2 NINO for global security		ERS-2015-27	E. Del Castillo	Michael Campbell	PH	AIO	A.Nowack ? G.Lestaris	2015	ERS	UASS
Accelerator alignment software - PLANE		ERS-2015-28	N. Ziogas	Michael Campbell	PH	MEF	KIRAMS	2015	ERS	UASS
CERNVM-FS		ERS-2015-29	N. Ziogas	Crispin Williams	PH	SFT	CosyLab	2015	ERS	UASS
RF & SSA for a medical facility Korea Institute of Radiological & Medical Sciences		ERS-2015-30	N. Ziogas	D. Missiaen	EN	RF	ITEL	2015	ERS	UASS
Request for support by CosyLab for RF Cavities		ERS-2015-31	N. Ziogas	J. Blomer	BE	RF	ANSALDO	2015	ERS	UASS
FLUKA licence			N. Ziogas	E. Jensen	BE	STI	ESS	2015	ERS	UASS
FLUKA licence			N. Ziogas	P.Sala, A.Ferrari	EN	STI	Novartis	2015	ERS	UASS
ActiWiz licence			N. Ziogas	P.Sala, A.Ferrari	DGS	CIS	GEANT	2015	ERS	UASS
Vidyo dashboard			N. Ziogas	H.Vincke & C.Theis	IT	CIS	Obuda University	2015	ERS	UASS
Global Services			N. Ziogas	J. Correia Fernandes	PH	ASE	University of Magdeburg	2015	ERS	UASS
Platform (C2MON)"			N. Ziogas	O.Beltramo	GS	AIS		2015	ERS	UASS
			N. Ziogas	J. Correia Fernandes	GS	ICE		2015	ERS	UASS
			N. Ziogas	Matthias Braeger	EN	VSC		2015	ERS	UASS
			N. Ziogas	D.Mathieson	TE			2015	ERS	UASS
			N. Ziogas	M.Zimny				2015	ERS	UASS
			N. Ziogas	P.Chigiato				2015	ERS	UASS
			T. Tsarfati					2015	ERS	UASS
			T. Tsarfati					2015	ERS	UASS

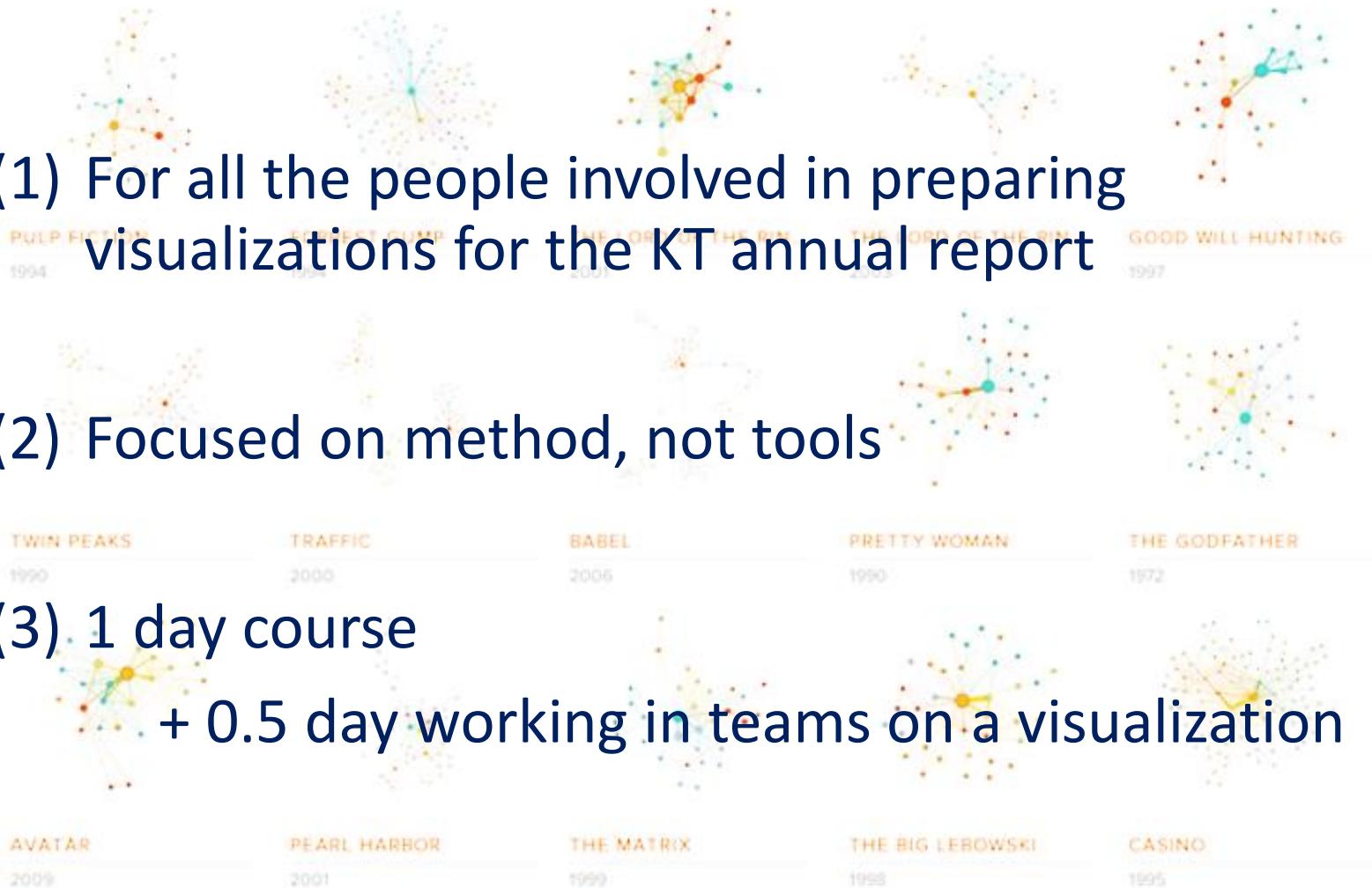
# Data visualization course

(1) For all the people involved in preparing visualizations for the KT annual report

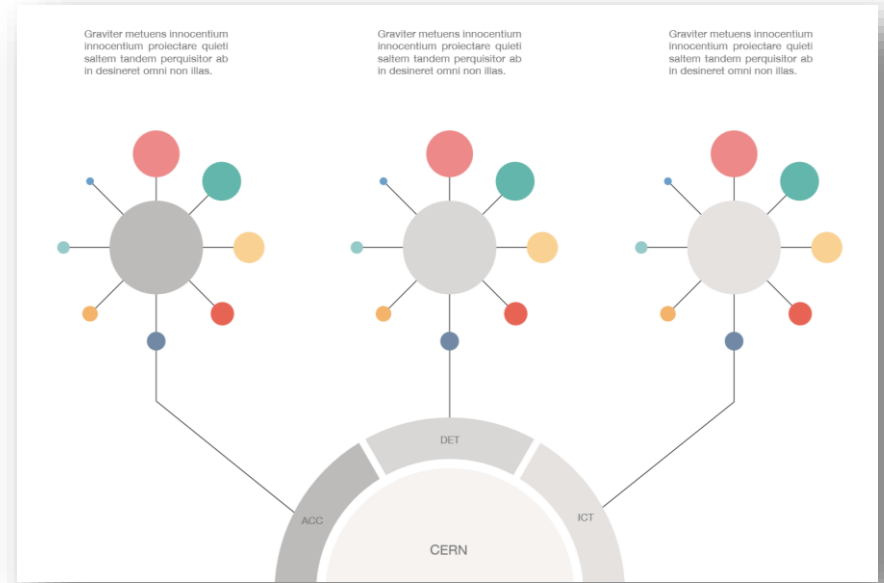
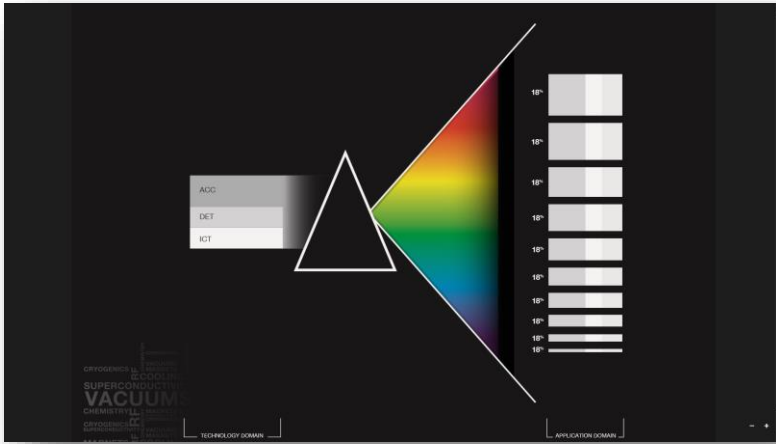
(2) Focused on method, not tools

(3) 1 day course

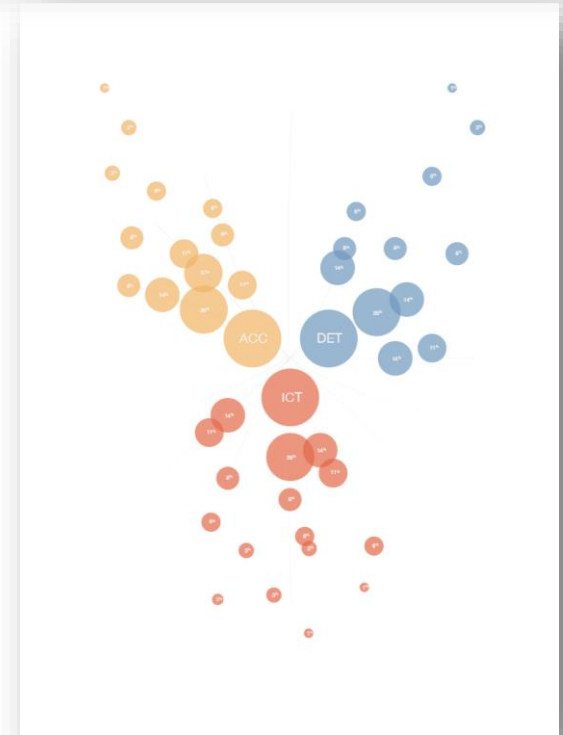
+ 0.5 day working in teams on a visualization







# Step 2: Mockups



# D3 JS

## Javascript Data Visualization library

- Selections

```
d3.selectAll("p").style("color", "white");
```

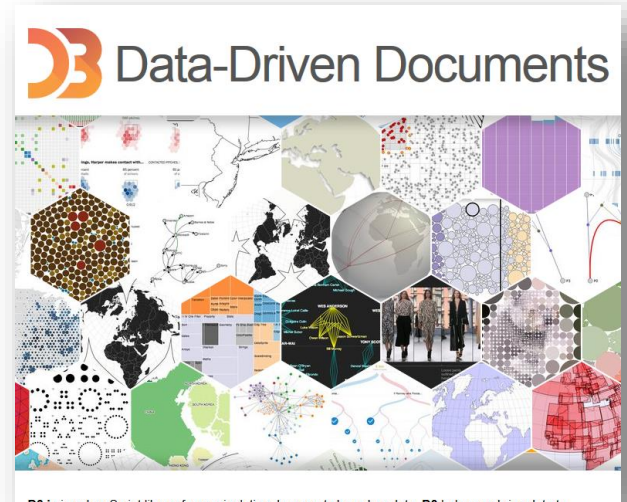
- Dynamic properties

```
d3.selectAll("p").style("color", function() {  
  return "hsl(" + Math.random() * 360 + ",100%,50%)";  
});
```

- Transitions – Interactions and animations

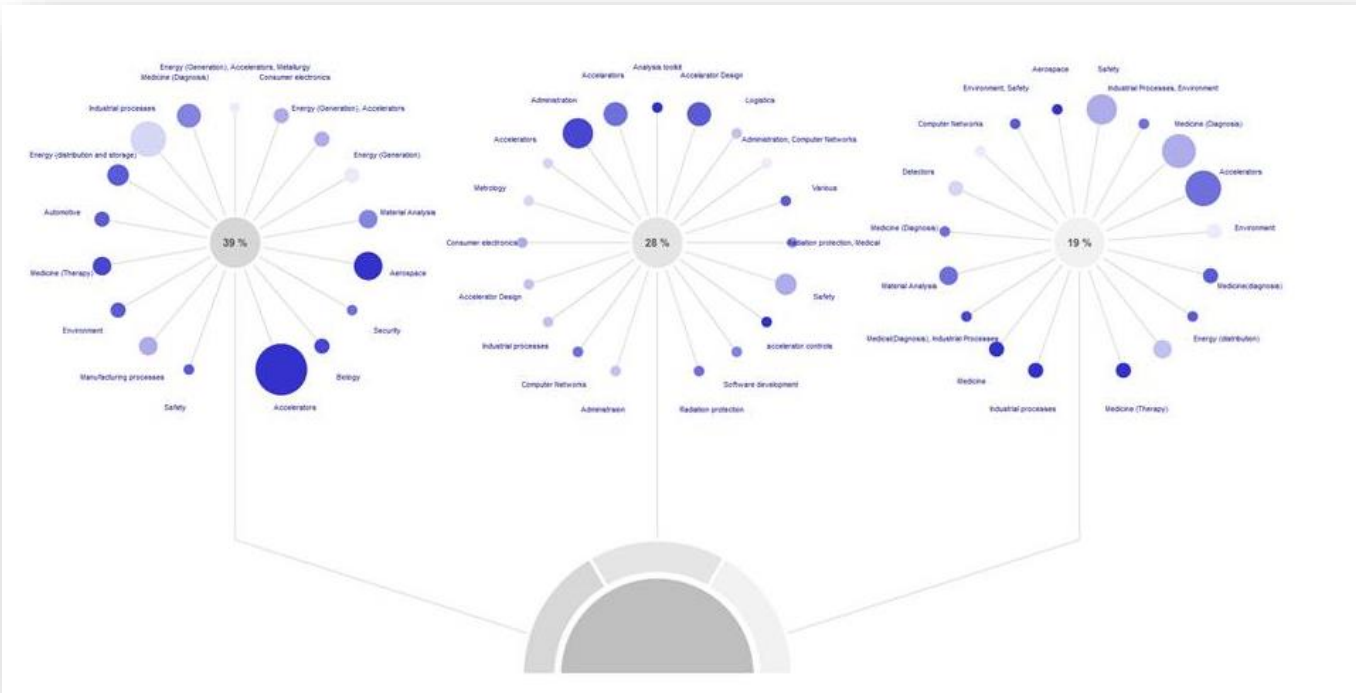
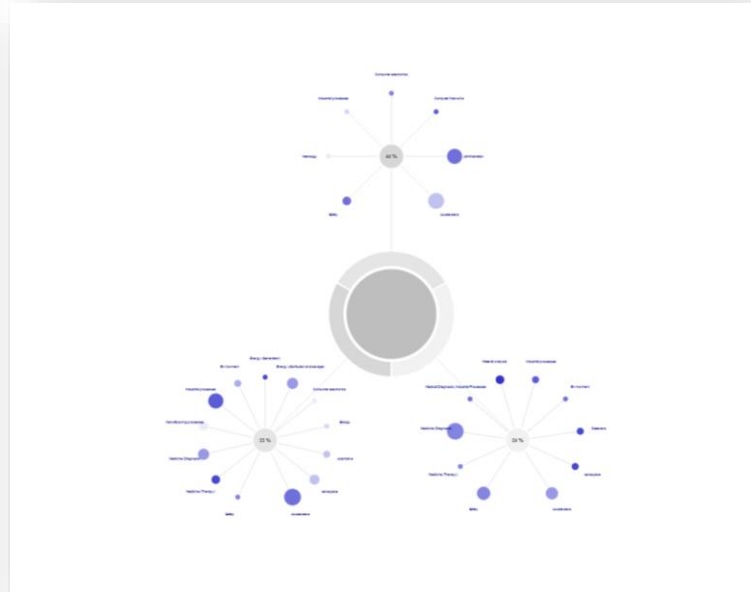
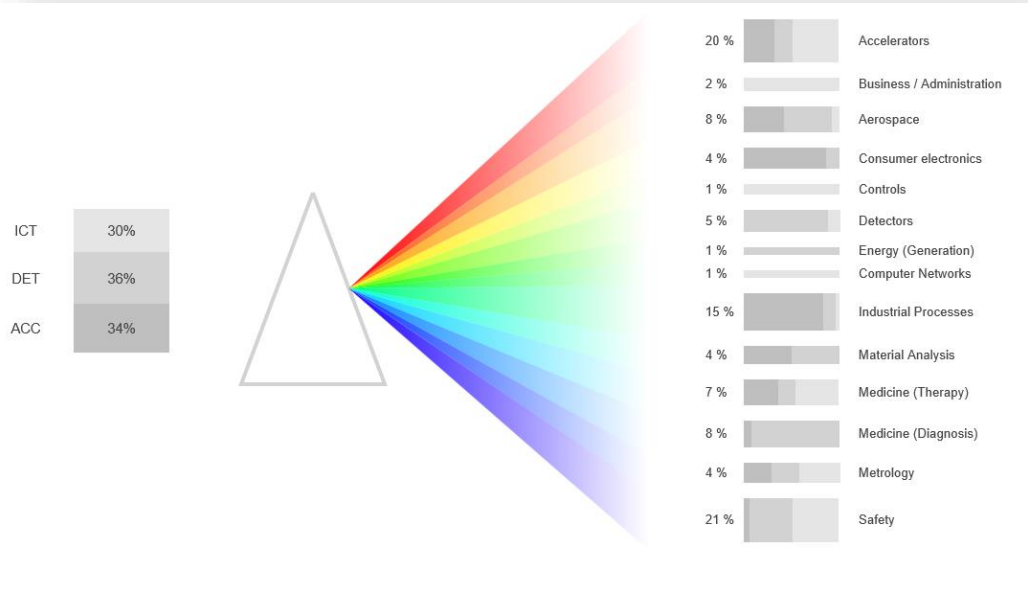
```
d3.selectAll("circle").transition()  
  .duration(750)  
  .delay(function(d, i) { return i * 10; })  
  .attr("r", function(d) { return Math.sqrt(d * scale); });
```

+ loading of CSV files !



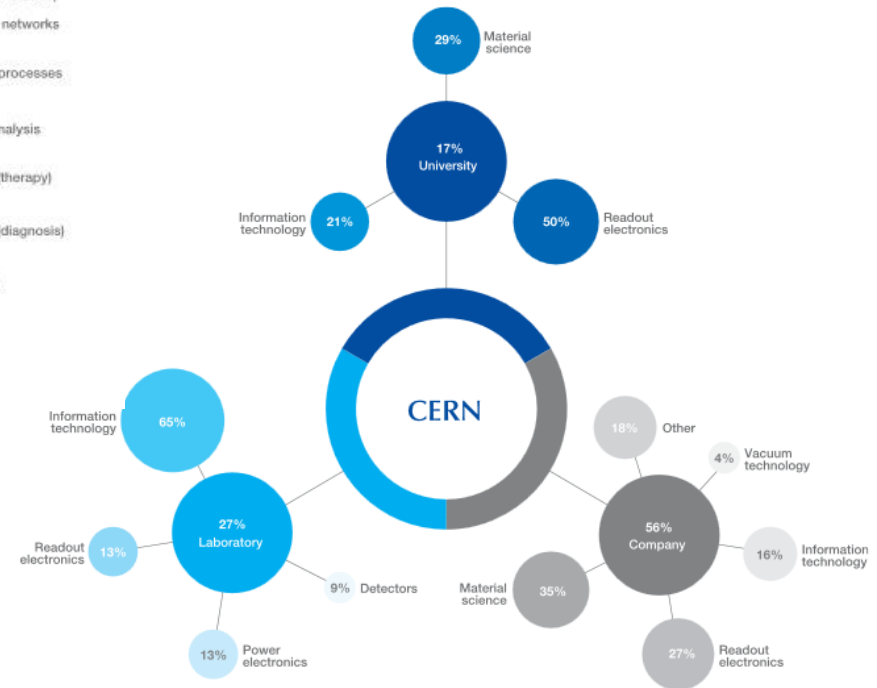
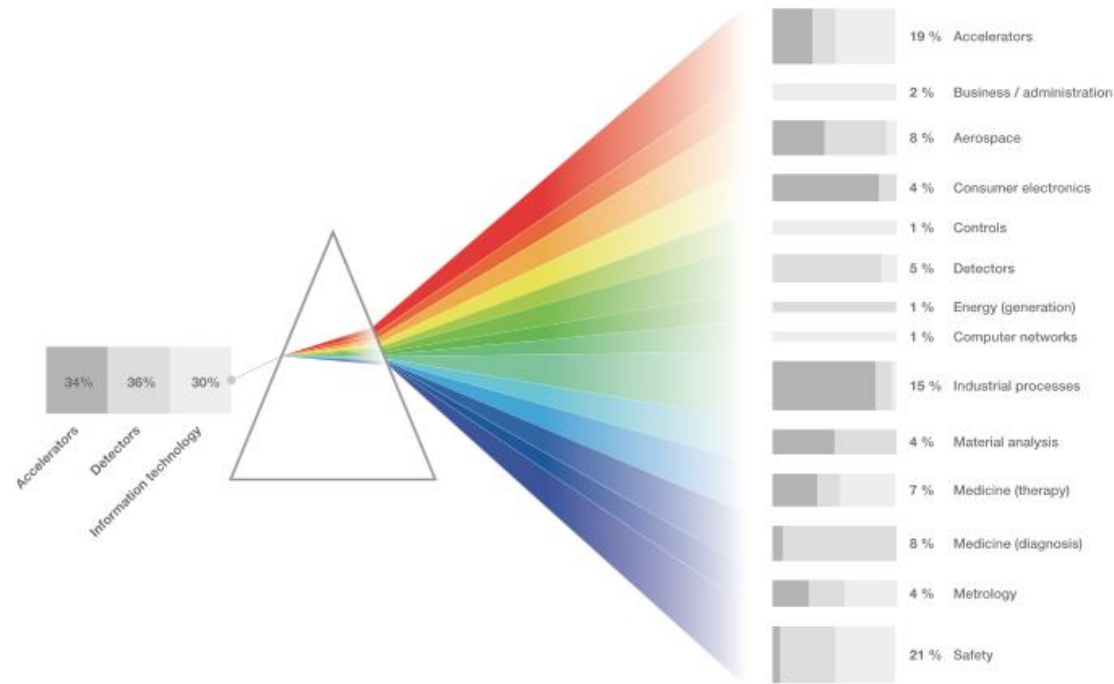
<http://d3js.org>





Step 3:  
D3 JS  
models

# Step 4: Graphical design



# Lessons and question

1. Data visualization is a multidisciplinary team sport
2. Tools like D3 JS help to see how the final visualization looks like
3. Important to play around

Question: data visualization community at CERN ?