open
source
.construction

Open Material Data

Leveraging the power of Open Data
to boost the usability of material data
in the construction industry

What to expect from today's workshop

10:00 - 10:05	Introduction & expectations
10:05 - 10:10	Problem
10:10 - 10:15	Solution
10:15 - 10:20	Operating Model
10:20 - 10:55	Discussion along prepared questions
10:55 - 11:00	Wrap-up

Introduction

Maximilian Vomhof
Head of Products & BD
@ vyzn AG
linkedIn

Markus Steinbrecher
CTO
@ Swiss Property AG
linkedIn

vyzn

open
source
.construction

- **OpenMaterialData**
- OpenSource.Studienauftrag
- further examples from the industry

open
source
.construction

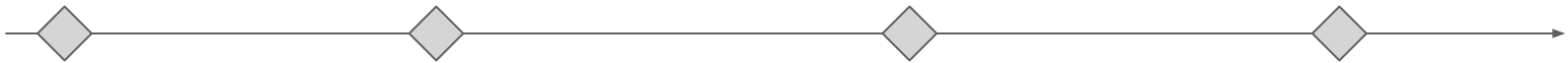
Status Quo

We got positive feedback from all stakeholders involved.

Project is nearing the end of the conception phase.

We welcome constructive feedback on technology and operating model.

Timeline



start 12/22

"best overall project"
@ AEC Hackathon in CPH
03/23

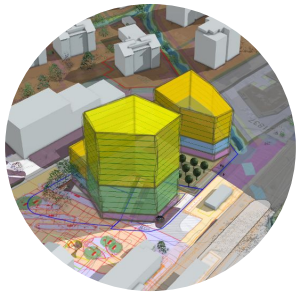
workshops tech setup and
operating model
Q2/23

MVP
Q3/23

PROBLEM

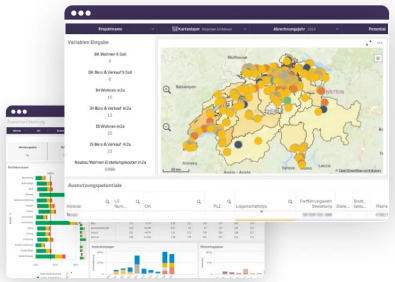
open
source
.construction

The effort to obtain material data is too high



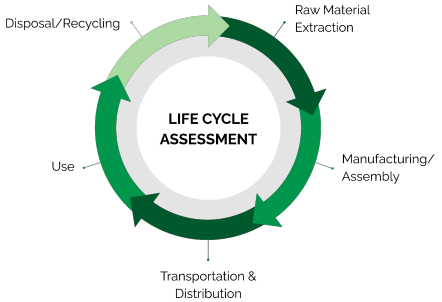
get
location
information

low



understand
value
potential

low



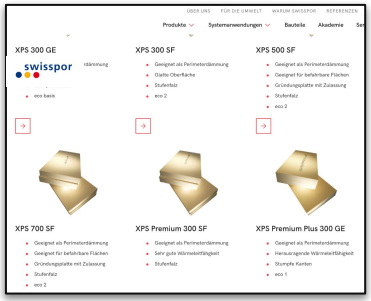
**make
optimised material
choices**

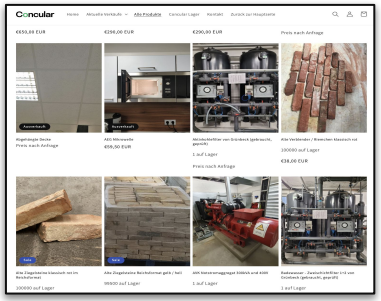
high

open
source
.construction

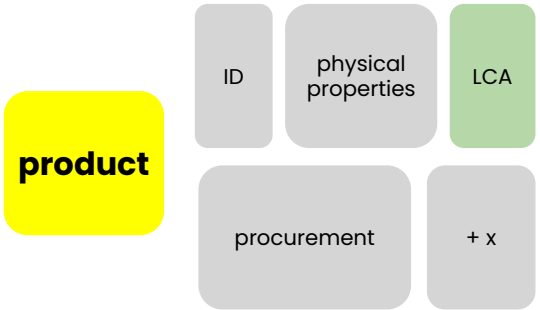
Search for products is highly analogue + experience driven

What (innovative) products are there?





What are their properties?



open
source
.construction

Example I: Database for LCA data, published by KBOB

KBOB / ecobau / IPB 2

	D	E	F	G	H	I	J	K	L	M	N	O	P
4	ID-Nummer Entsorgung	Entsorgung	Rohdichte/ Flächen-masse	Bezug Référence	UBP'21			gesamt globale					
5	No d'identification Déchets				UBP'21								
6					Total	Herstellung	Entsorgung	Total	Herstellung total	Herstellung energetisch genutzt	Herstellung stofflich genutzt	Entsorgung	Tota
7			Masse volumique/ surface		Total	Fabrication	Élimination	Total				Élimination	Tota
8					UBP	UBP	UBP	kWh oil-eq	kWh oil-eq	kWh oil-eq	kWh oil-eq	kWh oil-eq	kWh oi
9			-										
10	91.074	Entsorgung, Baugrubensicherung, Bohrpfahlwand, gespriesst	-	m^2	1'390'000	1'230'000	169'000	2'360	2'100	2'100	0	258	13
11	91.075	Entsorgung, Baugrubensicherung, Bohrpfahlwand, unverankert	-	m^2	1'320'000	1'160'000	169'000	2'160	1'910	1'910	0	258	12
12	91.076	Entsorgung, Baugrubensicherung, Bohrpfahlwand, verankert	-	m^2	1'000'000	889'000	111'000	1'680	1'510	1'510	0	170	11
13	91.077	Entsorgung, Baugrubensicherung, Nagelwand	-	m^2	222'000	198'000	24'500	361	323	323	0	37.4	24.
14	91.078	Entsorgung, Baugrubensicherung, Rühlwand, auskragend	-	m^2	447'000	407'000	39'300	994	934	934	0	60.0	10
15	91.079	Entsorgung, Baugrubensicherung, Rühlwand, gespriesst	-	m^2	317'000	294'000	23'000	698	663	663	0	35.2	47.
16	91.080	Entsorgung, Baugrubensicherung, Rühlwand, verankert	-	m^2	340'000	313'000	26'600	711	671	671	0	40.6	46.
17	91.081	Entsorgung, Baugrubensicherung, Schlitzwand, 400mm	-	m^2	913'000	828'000	84'800	1'410	1'290	1'290	0	129	96.
18	91.082	Entsorgung, Baugrubensicherung, Schlitzwand, 800mm	-	m^2	1'650'000	1'480'000	167'000	2'580	2'320	2'320	0	255	18
19	91.083	Entsorgung, Baugrubensicherung, Spundwand, auskragend	-	m^2	289'000	287'000	1'710	778	773	773	0	4.27	44.
20	91.084	Entsorgung, Baugrubensicherung, Spundwand, gespriesst	-	m^2	163'000	162'000	935	438	436	436	0	2.34	24.

Erläuterung Explication | Baumaterialien Matériaux | Gebäudetechnik Technique | Energie Énergie | Transporte Transports | Entsorgung Déchets | +

Example II: Product documentation by swisspor & Knauf

TP-KD 430

Januar 2023

GLASWOLLE

EN 13162 / sia 279.162
MW-EN 13162-T4-WS-WL(P)-AFr5

ANWENDUNG

TECHNISCHE DATEN

Eigenschaften	Zeichen	Beschreibung / Daten	Einheit	Norm
Brandverhalten	Euroclass	A1	–	EN 13501-1
Anwendungstemperatur	–	bis 150	°C	–
Rohdichte ca.	ρ	25	kg/m³	EN 1602
Wasserdampfdiffusions-widerstandszahl	μ	~1	–	EN 12086
Längenbezogener Strömungswiderstand	Ξ	5	kPa s/m²	EN 29053
Hydrophobierung	–	ja	–	EN 13162
Grenzabmasse für die Dicke	Ti	T4 (– 3 % oder – 3 mm/+ 5 % oder + 5 mm)	mm	EN 13162
Wasseraufnahme bei kurzzeitigem, teilweisem Eintauchen	WS	erfüllt	kg/m²	EN 1609
Wasseraufnahme bei langzeitigem, teilweisem Eintauchen	WL(P)	erfüllt	kg/m²	EN 12087
Spezifische Wärmekapazität	Cp	850	J/(KgK)	–

GLASS Vento 032 white

Produktbeschreibung
Halbsteife und formstabile Wärmedämmplatten aus Glaswolle mit auflaminiertem, hellem Glasvlies und wasserabweisender Oberfläche.

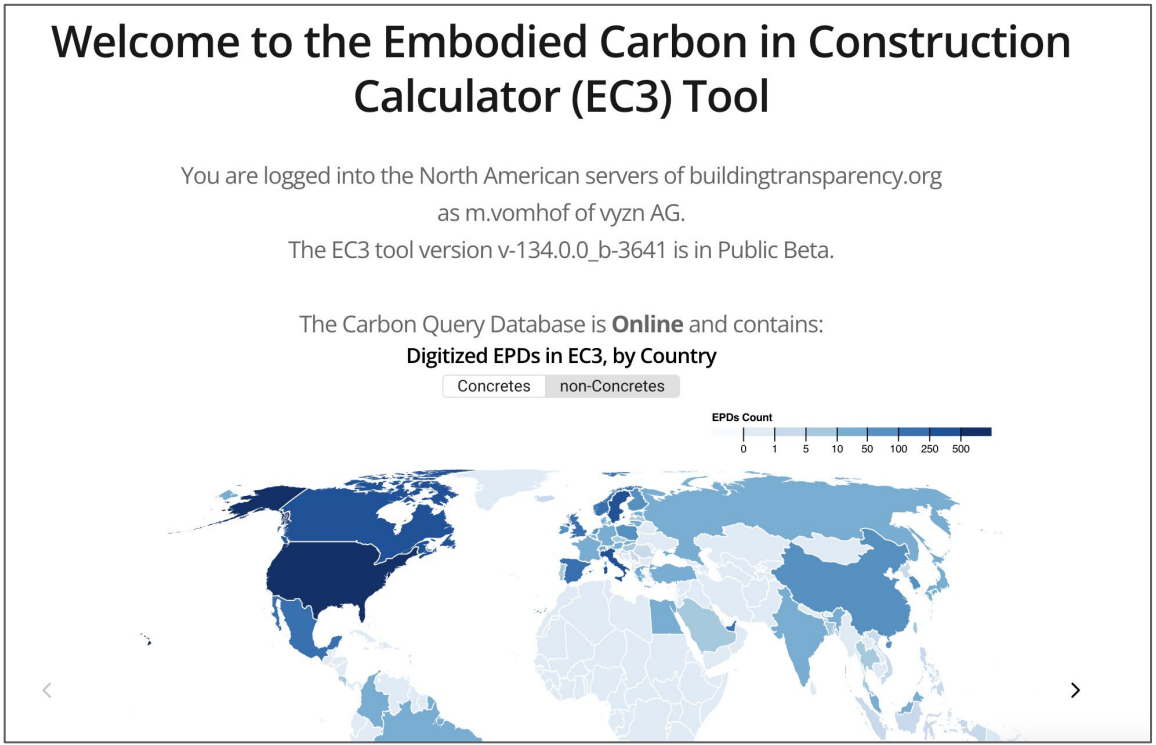
Format	1250 x 600 mm
Dicke	30 - 300 mm

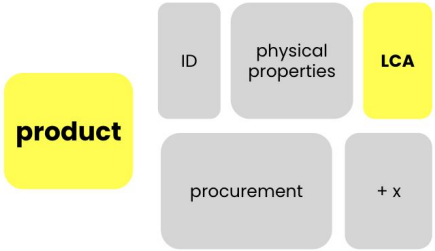
Technische Daten

Merkmal	Symbol	Norm	Wert	Einheit
Nennwert Wärmeleitfähigkeit	λ_D	279	**0.032**	**W/(m·K)**
Brandverhalten		13501-1	**A1**	
Brandverhaltensgruppe		VKF	**RF1**	
Dichte			**~ 29**	**kg/m³**
Diffusionswiderstandszahl	μ	12086	**~ 1**	

open
source
.construction

Example III: EPD data by EC3





EPD = environmental product data

Why do we still have to copy and paste with Excel?

Problem: available data is not usable

Datasets that cover
a) mechanical properties
b) physical properties
c) sustainability indicators
d) supplier information
of construction materials are not „digitally“ available.

Data is spread across a variety of sources:

- websites of manufacturers
- websites of suppliers
- websites of service providers that create proprietary data collections, often with a focus on LCA or procurement
- generic data from norms

Data has to be compiled manually by the individual players in a planning team, which leads to intransparency and redundant work.

Manufacturers would be the reliable source of material and product data but have difficulties to deliver

Manufacturers have difficulties for a number of internal and external reasons. Key problems with the available data are:

1. Data is published according to **varying standards**.
2. Data is **distributed across different sources** (e.g. mechanical and physical properties in a fact sheet, LCA indicators in an EPD which is stored separately).
3. Data is **incomplete** to some extent.
4. Data is usually **not accessible via API** but “hidden” in .pdf documents or tables.

Problem is currently being tackled from various angles

On the one hand, there are **efforts on the legislative side** to further standardise the requirements for digital product data.

The EU Digital Product Passport shapes the future of value chains:
What it is and how to prepare now

The challenge here is speed: it takes a long time for laws to be passed and to be implemented by market participants.

On the other hand, there are **private-sector initiatives** that strive to build up comprehensive, cross-manufacturer material and product databases.

2050 materials
buildup.
madaster
ProMaterial The digital construction network
bimobject
Building Material Scout

To date, these databases, for which a registration fee is usually charged, failed to be relevant in the market (from a global perspective) and probably will have difficulties to do so in comparison to standardised, open approaches.

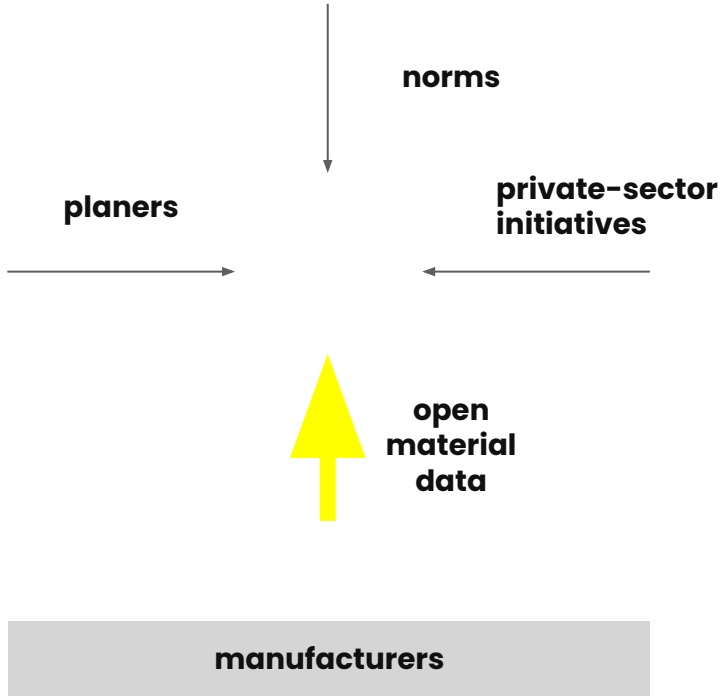
SOLUTION

Can open data make the difference?

Main goals:

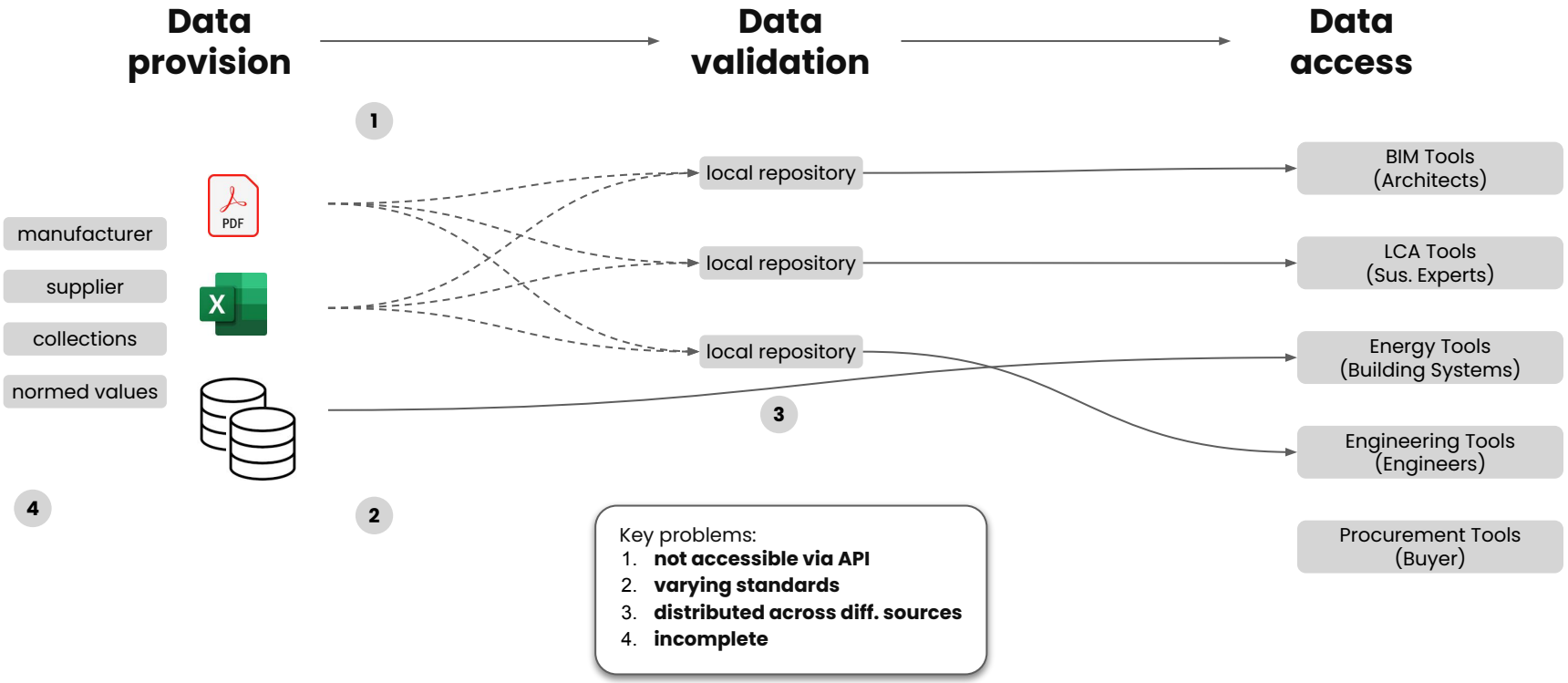
Discoverability: cross-manufacturer search and filtering for materials and products

Usability: same data sets for individual materials/products can be used in different software tools

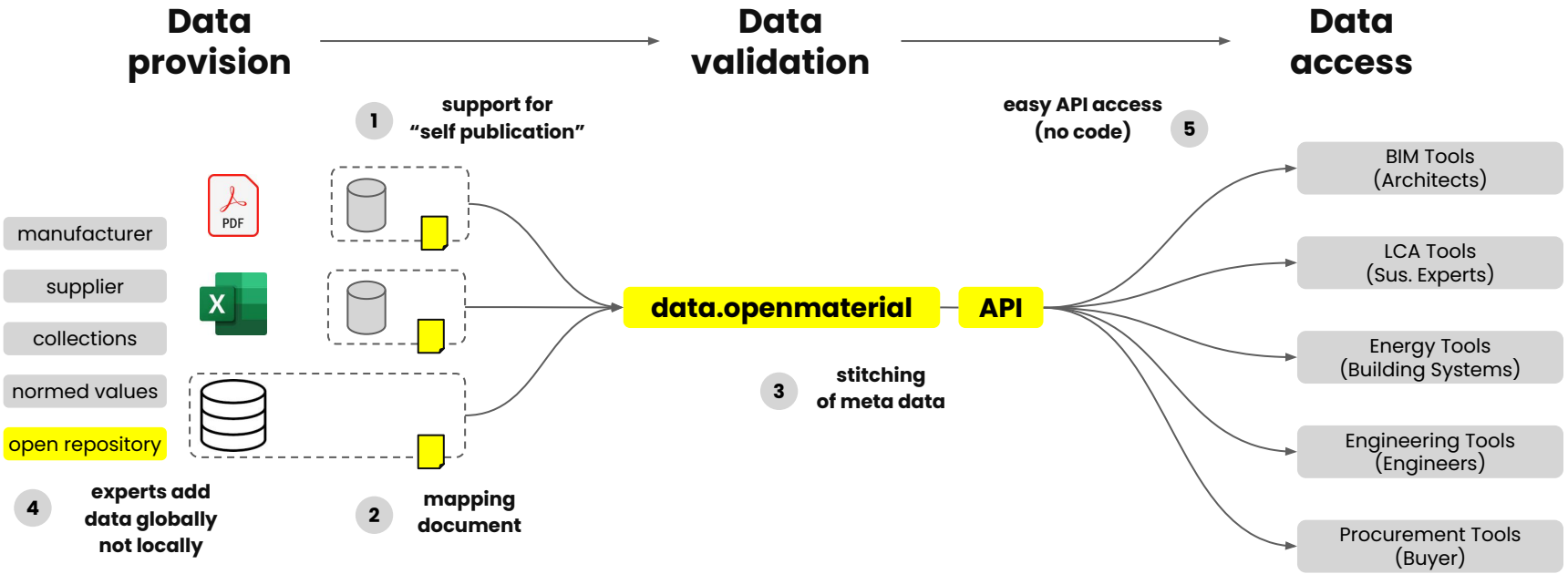


open
source
.construction

Initial situation



Tackling the problem at its root



OPERATING MODEL

Core development guidelines

Decentralisation

The OMD project supports decentralised publication efforts of manufacturers instead of collecting all data in one central database.

#enablement

Collaboration

Experts are empowered to validate and improve available data globally instead of maintaining individual data sets locally.

#uniting #efforts

Open Data

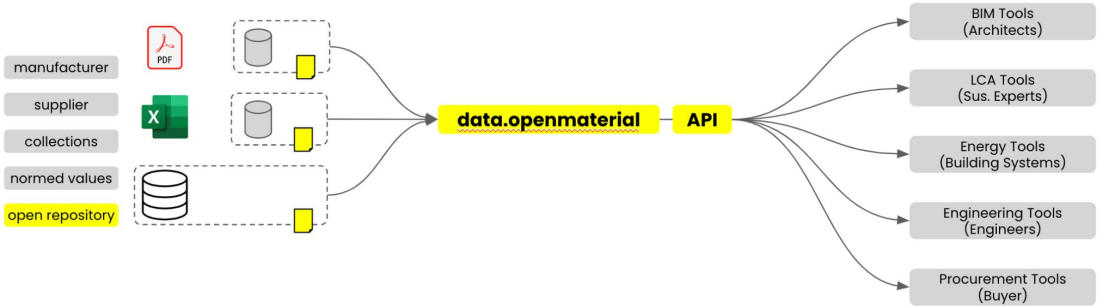
A “central API” will allow any data consumer to freely access data registered in the open data environment.

To secure open access and create trustworthiness, core components are managed by a not-for-profit organisation.

#no code

open
source
.construction

Operating Model



Key deliverables of the association:

1. setup and maintenance of open data environment (registration of sources, stitching, commenting)
2. setup and documentation of API
3. provision of neutral webserver to enable data adding by experts

Role of commercial service providers:

1. setup of webserver & technical support for manufacturers
2. development of user specific tools & websites to interact with the data
3. ...

THANK YOU!