A background network diagram consisting of numerous nodes (dots) connected by thin lines, forming a complex web. The nodes are in shades of brown, tan, and grey, and the lines are thin and light brown. The overall effect is a dense, interconnected network.

From physical to digital

ALEXIS BECK &
KAMIL DOBOSZ

Presentation of the specimen

- Apodemus alpicola, MHNG-MAM-1863.050
- Its value comes from the historical data we gathered
- Let's try to organize it !

Activity 1

From the data we have gathered about the specimen, try to create a datamodel (possibly a relational datamodel) which could host them

Activity 1 – core data (10 min)

- MHNG-MAM-1863.050
- *Apodemus alpicola* Heinrich, 1952
- Determinavit : Gilliéron, Jacques
- Full without skull & Skull
- Collecting date : 29 July 1933
- WGS84 : 46.6° N / 10.06° E, uncertainty in meters : 7070
- Grabunden, Switzerland
- Male
- Collectors : Revilliod, P. & Baer, J.G.

Activity 1 - presentation

2 or 3 groups present their proposition

Pre-digitization : cataloguing a specimen

- Possible on paper (entry book)
- Basics information to retrieve the physical specimen
 - Reference number
 - Genus and Species
 - Collecting date
 - Collecting location
 - Specimen parts
 - Main attributes

Pre-digitization : cataloguing a specimen

V.B. 23802	1863								
01	<i>Sorex harrisi</i>	♂	Entier	Finlande: Oulu, Kuhmo	23.08.1964	Don. A. Moilan	α 274		
02	"	♂	"	"	24.08.1964	"	α 275		
03	"	"	"	"	25.08.1964	"	α 280		
04	"	"	"	"	"	"	α 281		
05	"	"	"	"	"	"	α 282		
06	"	♂	"	Lapland, Rovaniemi	27.08.1964	"	α 284		
07	"	♂	"	"	"	"	α 283		
08	"	♂	"	" , Mutsa	30.08.1964	"	α 306		
09	"	♂	"	"	31.08.1964	"	α 307		
10	<i>Crocidura leucodon</i>	♂	"	Allemagne: Baden-Württemberg, Ludwigsburg	- 09.1964	"	α 434		
11.902	<i>Sorex araneus</i>	"	P+c	CH: Vaud, Chésaux	21.06.1964	"	VD 98		
12	<i>S. araneus</i> <i>scroonatus</i>	"	Crâne	" , Lausanne	26.08.1965	"	VD 298		
23902	<i>Talpa europaea</i>	ind.	"	"	-	"	JNF 1		
14	"	"	"	"	-	"	JNF 10		
15	"	"	"	"	-	"	JNF 14		
16	"	"	"	"	-	"	JNF 16		
17	"	"	"	"	-	"	JNF 17		
18	"	"	"	"	-	"	JNF 18		
19	"	"	P+c	"	-	"	JNF 23		
20	"	"	Entier	Vaud, -	-	"	VD 1674	Voix 1658041	
21	"	"	P+c	"	-	"	VD 1675	" 1653022	
22	"	"	"	"	-	"	VD 1676	" 1653023	
23	"	"	Entier	"	-	"	VD 1677	" 1653024	
24	"	"	"	"	-	"	VD 1678	" 1653025	
25	"	"	"	"	-	"	VD 1679	" 1658042	
26	"	"	"	"	-	"	VD 1680	" 1659091	
27	"	"	"	"	-	"	VD 1681	" 1659092	

27	"	"	"	"	"	"	"	VD 1681	" 1659092
28	"	♀	"	France: Pyrénées-Orientales, Rutes?	01.09.1963	"	F 6		
29	<i>Sorex minutus</i>	♂	P+c	Slovaquie: Zilinsky, Zuberec	27.08.1965	"	β 22		
61002	<i>Pitymys subterraneus</i>	"	Crâne	CH: Vaud, St.-Cergue	16.10.1969	"	VD 766		
31	"	"	"	"	09.12.1969	"	VD 771		
32	"	"	"	" , Bullet	01.11.1979	"	VD 1684		
41002	<i>Crocidura russula</i>	ind.	Entier	" , Bois de Chêne	27.06.1974	"	FM 2		
34	<i>Clethrionomys glareolus</i>	"	"	"	"	"	FM 5		
35	<i>Arvicola terrestris</i>	"	"	"	05.07.1973	"	-		
36	<i>Meriones persicus</i>	♀	P+c	- , Bachtaga	-	"	-		
37	"	♂	"	- , Talow	-	"	-		
38	<i>Ellobius lutescens</i>	♀	"	-	-	"	-		
151002	<i>Sorex araneus</i>	♂	"	France: Hautes-Alpes, Les Albets	21.05.1969	"	F 66		
40	"	"	"	" Bas-Rhin, Kolbsheim	01.07.1969	"	F 84		
41	<i>Pitymys multiplex</i>	♀	"	" Hautes-Alpes, -	07.06.1971	"	EL 487		
42	" sp.	"	Crâne	CH: Tessin, Magadino	- 11.1977	"	TI 450		
43	"	♂	Entier	" Valais, St. Martin	26.07.1986	"	VS 824		
44	<i>Apodemus flavicollis</i>	"	Crâne	" Grisons, Parc National	- 07.1933	Don. P. Revilliod	PNCH 23		
45	" <i>alpata</i>	"	Entier	"	"	"	" 24		
46	" <i>alpata</i>	♀	"	"	"	"	" 28		
47	" <i>alpata</i>	"	"	"	"	"	" 30		
48	" <i>alpata</i>	ind.	"	"	27.07.1933	"	" 56		
49	" <i>alpata</i>	"	"	"	29.07.1933	"	" 64		
50	" <i>alpata</i>	"	"	"	"	"	" 66		

Flat file digitization

- Possible on paper (offline)
- Enhancing data by adding more information
- Verbatim data (original data) and Interpreted data (inferred)
- Basis for a digital specimen in a simple way

mhn-mamo-mam (taranis)

Fichier Edition Affichage Insertion Format Enregistrements Scripts Fenêtre Aide

1 / 46392
Trouvés (Non triés)
Enregistrements

Afficher tout Nouvel enregistrement Supprimer l'enregistrement Rechercher Trier Partager

Modèle : Saisie_2 Format affichage : Prévisualisation AA Modifier.

Numéro sci...	Mots_Clés	Genre	Espèce	Sous esp...	Document annexe	Emplacement	Pays	Province	Localité	Station	Parties	Sexe	Age	
1863.050	Parc national suisse; Apodemus alpicola;	Apodemus	alpicola		Armoire -1 (couloir	-1	Suisse	Grisons	S-chanf, Parc National	Val Trupchun /	Entier+crâne	M.	juv.	Gilléron 2009

Flat file digitization

mhn-mamo-mam (taranis)

Fichier Edition Affichage Insertion Format Enregistrements Scripts Fenêtre Aide

1 / 46'392
Trouvés (Non triés)
Enregistrements

Modèle: Saisie_2 Format affichage: Prévisualisation

FICHER Mammifères archive seulement !

Collection	Mammifères	Numéros Coll.	PNCH 66
Numéro scientifique MHNG	1863.050	Famille:	Muridae
Ordre	Rodentia	Sous famille:	Murinae
Genre	Apodemus	Aut.et date sp.	Heinrich, 1952
Espèce	alpicola	Aut. et date ssp.	
Sous espèce			

Région Géo	Paléarctique	Parties	Entier+crâne	Nb.	1
Pays	Suisse	Mode	Alcool	Alt. (m)	
Province	Grisons	Sexe	M.	LT (mm)	Q (mm)
Localité	S-chanf, Parc National	Age	juv.	PP (mm)	Or (mm)
Station	Val Trupchun / Trupchun (rive gauche)	Type		AB (mm)	Pds (g)

Déterminavit	J. Gilliéron	Collecteur	P. Revilliod & J. G. Baer
Date de récolte	29 / 7 / 1933	Mode d'acquisition	Don
Année d'acquisition		Source d'acquisition	Coll. Parc National

Genre ancien		Ssp.ancien	
Espèce ancien		Cré.de la fiche:	20.11.2002 7.12.2022
Aut. et date sp. anc.		Emplacement	-1
Aut. et date ssp anc.			-70°C
			-20°C

Document annexe	Armoire -1 (couloir)	Mots_Clés	Parc national suisse; Apodemus alpicola;
Remarques	Gilliéron 2009		

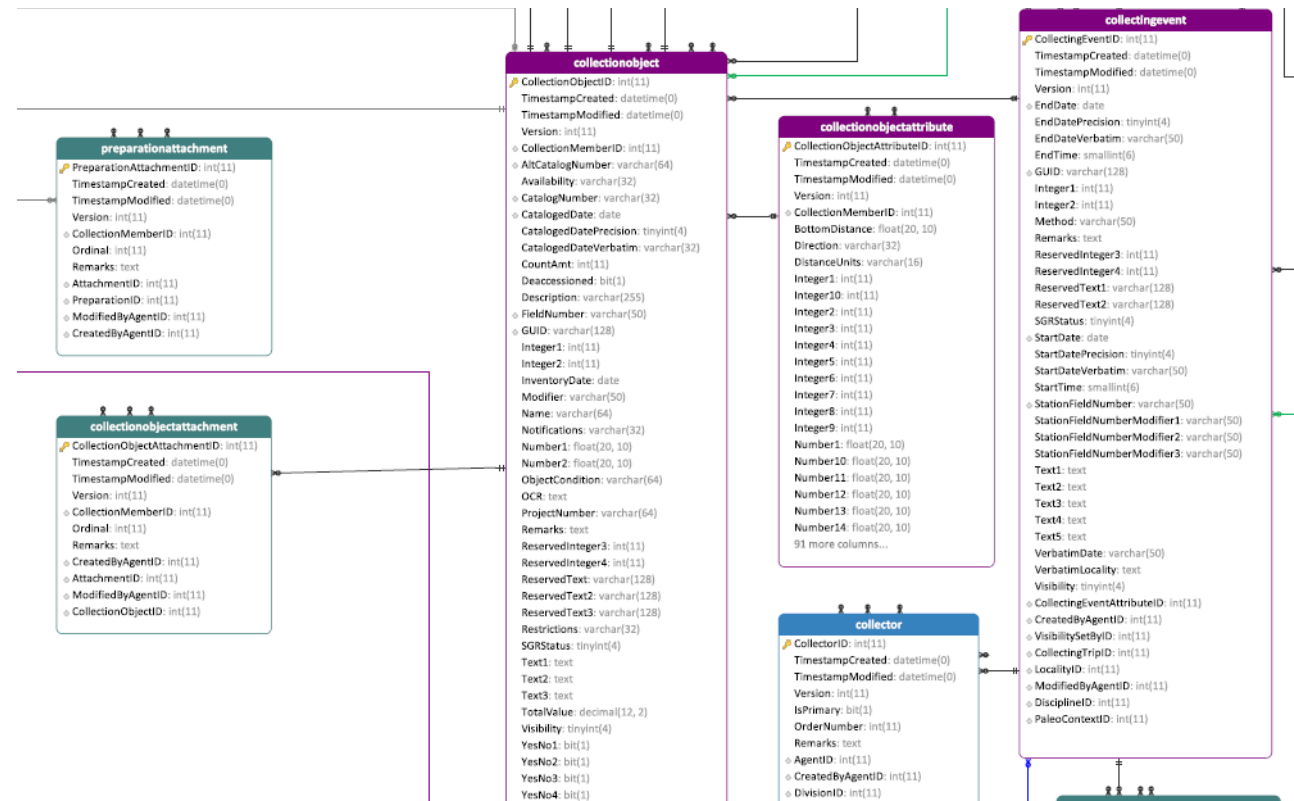
References	
GenBank	
Saisie V.B.	LatitudeDecimale 46.600901 LongitudeDecimale 10.063767 5

MHNG-MAMO-0033465

Donnée protégée non

PrecisionGEO

Relational vs Flat database



Relational vs Flat database

Example

You want to modify an error on a person's name whose appears 100 times in the database in different fields.

+ if you want to add its phone number/email address?

Relational vs Flat database

PROS

- Global error correction
- Storage space-saving
- Possibility of enriching data models
- Modifications with global information propagation

CONS

- Increases data complexity
- Increases maintenance costs
- Steep learning curve

CMS :

Modern digitization

- Relational database
- Complex and domain-specific data model
- Functionalities grouped within a single software, including :
 - Thesauri management
 - Loans management
 - Attachments
 - Labels creation
 - Facilitate the export to data aggregators (SVNHC, GBIF)

a CMS doesn't make it for you :

Data interoperability

- Resilient database model
 - For specific cases
 - For future needs
 - Non-aggregate fields
- Use of standards when possible (DwC or ABCD)
- Build you database around vocabularies
- Include identifiers and not only free text
 - Taxonomy (eg. catalog of life Ids, Gbif Ids)
 - Persons (ORCID, WikiData, VIAF)

TAXON IDENTIFIERS

Catalogue of Life ID : [FRHS](#) • ITIS TSN : [585126](#) •
NCBI taxonomy ID : [100381](#) • Freebase ID : [/m/02vscbw](#) •
MSW ID : [13001205](#) • Encyclopedia of Life ID : [1178738](#) •
GBIF taxon ID : [2437769](#) • Fauna Europaea ID : [305581](#) •
IUCN taxon ID : [1907](#) • iNaturalist taxon ID : [45559](#) •
TAXREF ID : [61494](#) • ADW taxon ID : [Apodemus_alpicola](#) •
Fauna Europaea New ID : [23871372-9a8f-4f5b-b291-b6cf47f9354e](#) •
IRMNG ID : [10220065](#) • EUNIS ID for species : [11236](#) •
Observation.org taxon ID : [81785](#) • CAB ID : [38751](#) •
ZOBODAT taxon ID : [174693](#) • UMLS CUI : [C1046166](#)

source: [wikidata: Q302765](#)

References

- Greeff, M., Kolbmann, W., Burri, T., Stöckli, E., Klaasen, S., Beck, A., Chervet, N., Tschudin, P., Menkveld-Gfeller, U. & Frick, H. 2021: Databasing, Digitalisation & Data storage. In: Frick, H. & Greeff, M. (eds.). Handbook on natural history collections management – A collaborative Swiss perspective. Swiss Academies Communications 16(2): 135-176.
- Dillen M, Groom Q, Hardisty A (2019) Interoperability of Collection Management Systems. ICEDIG Deliverable D4.4 <https://doi.org/10.5281/zenodo.3361598>

Activity 2

Based on the key elements given during the presentation, try to make a version 2 of your *Apodemus alpicola* database (correct it)

Activity 2 – core data (10 min)

- MHNG-MAM-1863.050
- *Apodemus alpicola* Heinrich, 1952
- Determinavit : Gilliéron, Jacques
- Full without skull & Skull
- Collecting date : 29 July 1933
- WGS84 : 46.6° N / 10.06° E, uncertainty in meters : 7070
- Grabunden, Switzerland
- Male
- Collectors : Revilliod, P. & Baer, J.G.

Demo

Let's see how Apodemus alpicola is organized in a modern CMS and how its data can be then transferred to an aggregator like the SVNHC