



National Genbank System

Asya Stoyanova-Doycheva
Plovdiv University, Bulgaria

DAAD 2023, Workshop

The impact of pandemic years to informatics education: review and next steps

Introduction

- BG PLANTNET “Establishment of National Information Network GenBank – Plant genetic resources”.
- National Gene Bank in Institute of plant genetic resources in Sadovo town, Bulgaria

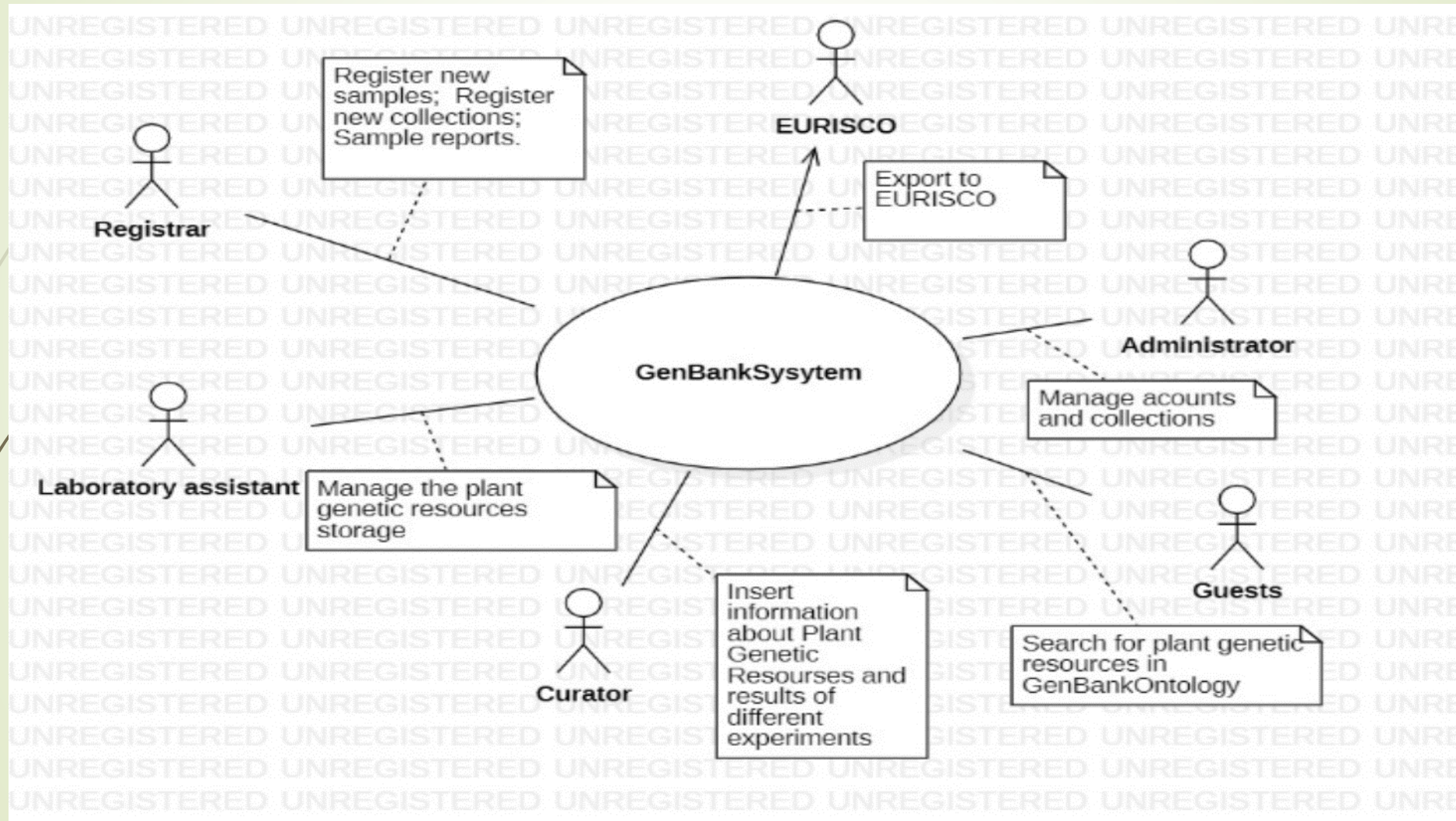




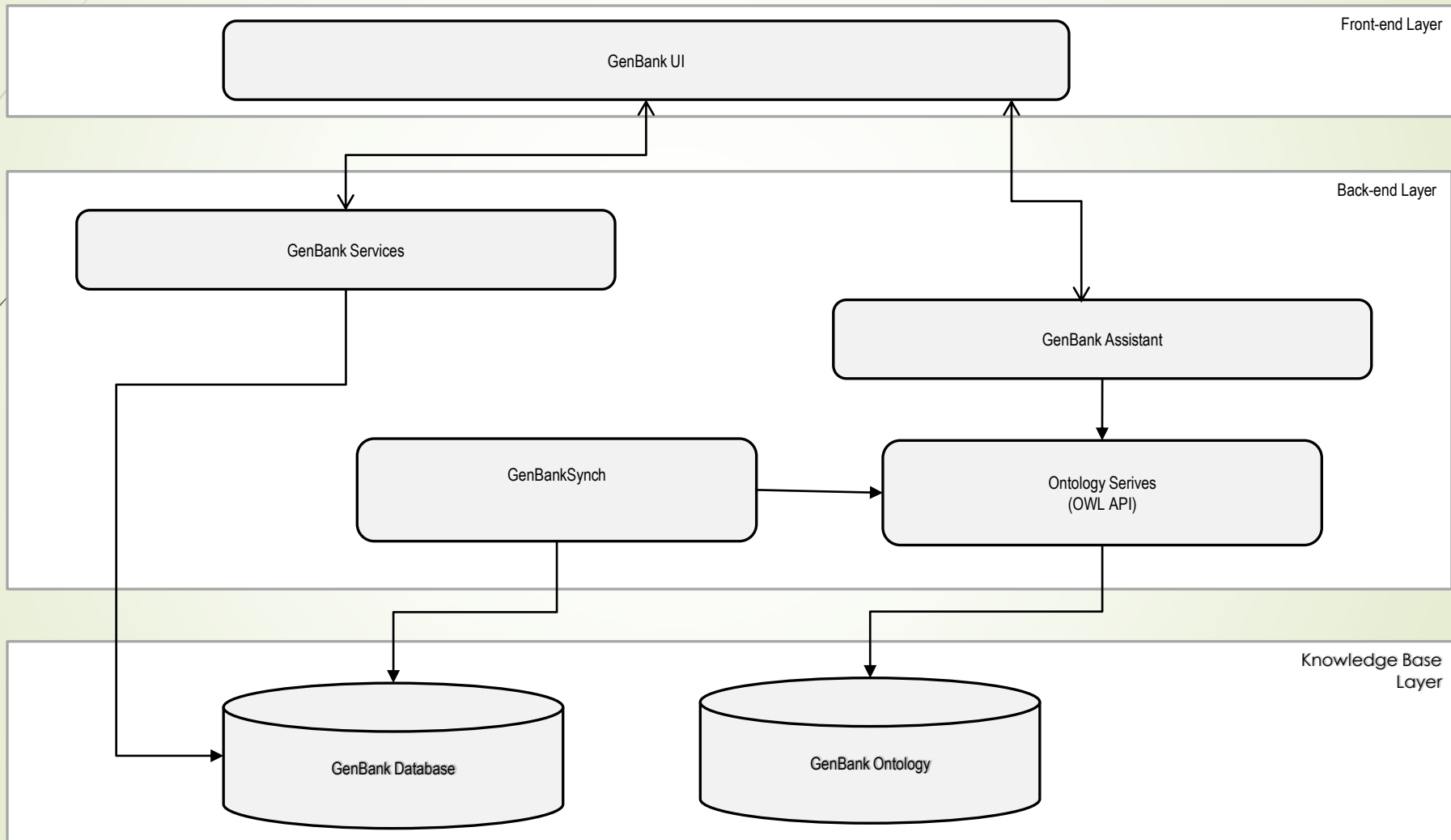
The goals of the project

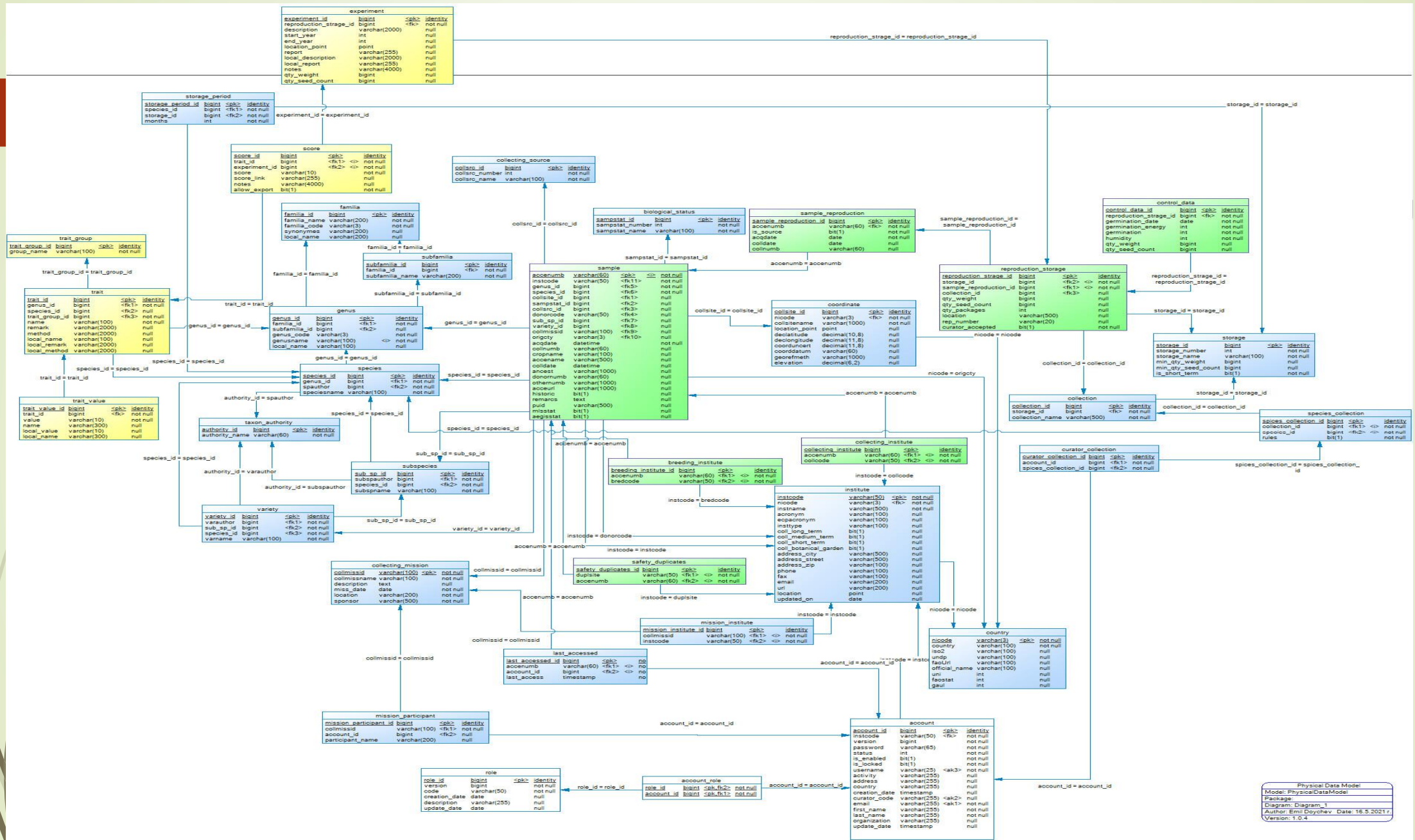
- ▶ Development of management system for plant genetic resources.
 - ▶ Store the information about the samples according the EURISCO standard.
 - ▶ Create an export of passport data about plant genetic resources to exchange it with Europe gene bank systems.
 - ▶ To be used by different users in the Institute of plant genetic resources in Sadovo town.
- ▶ In accordance with the International Plant Genetic Resources Treaty and the Nagoya Protocol, Japan the data on the various genetic resources must be available to all stakeholders – institutes, universities, farmers, and others. This obliged the Gene Bank System to provide a module, through which these stakeholders could access information on plant genetic resources.

Gene Bank Management System



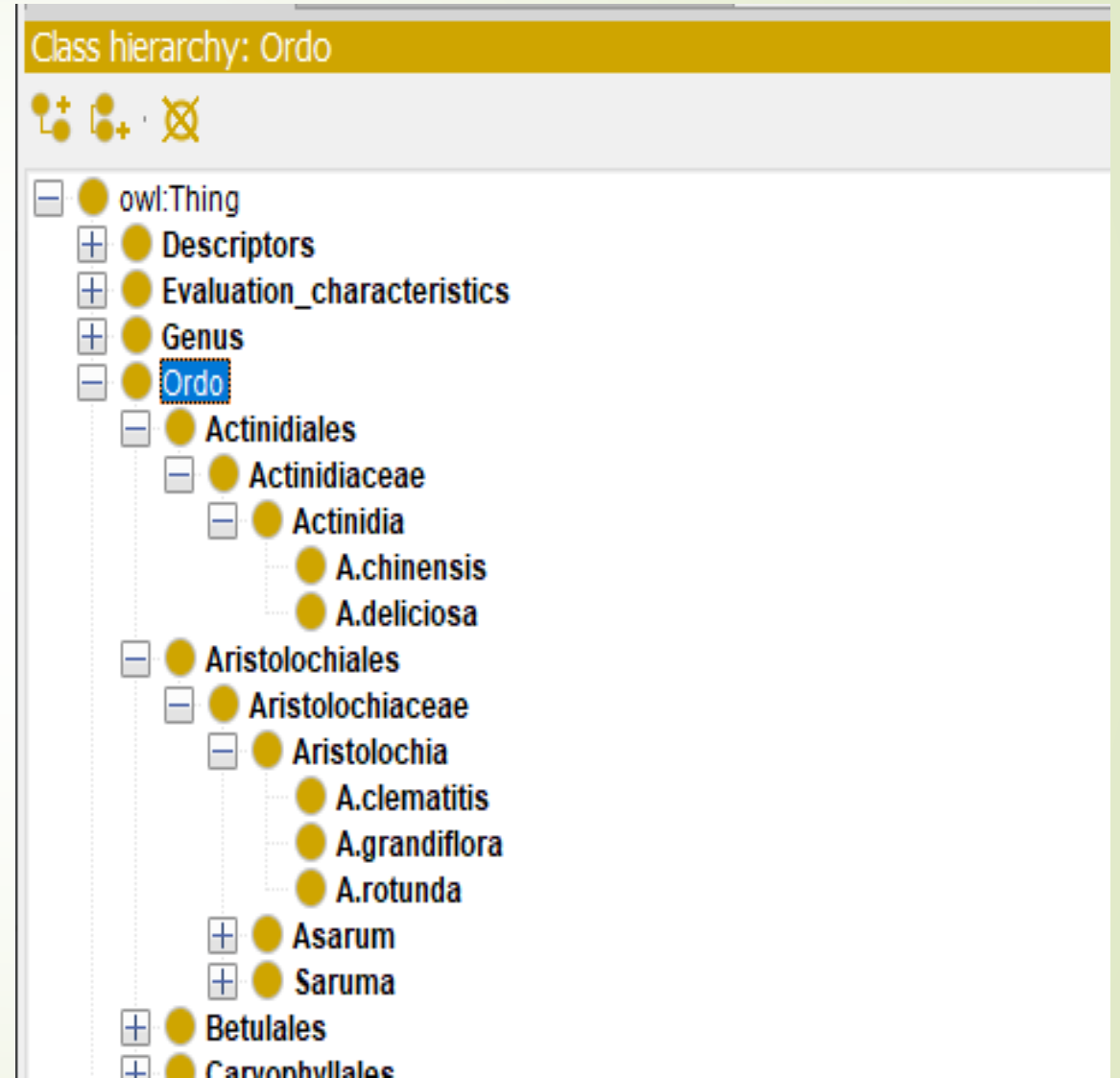
Architecture of the Gene Bank System










Gene Bank Ontology

- The ontology of plant genetic resources has been developed based on the plant taxonomy and the requirements of the EURISCO standard for the description of plant passport data. In developing the ontology, some specific characteristics of the plants were considered.














Descriptors class


2017-TRT-MC-5 — <http://www.semanticweb.org/astoyanova/ontologies/2020/1/GenBank#2017-TRT-MC-5>


Description: 2017-TRT-MC-5     





Property assertions: 2017-TRT-MC-5


Types 


-  **Descriptors**    
-  **vulgare**    


Same Individual As 



















Different Individuals 


   

Object property assertions 

-  **hasEvaluationCharacteristics** EvCh-2017-TRT-MC-5

Data property assertions 

-  **INSTCODE** "BGR001"^^xsd:string
-  **LONGITUDE** "0254109E"^^xsd:string
-  **COLLSRC** 20
-  **ORIGCTY** "BGR"^^xsd:string
-  **ELEVATION** "172"^^xsd:string
-  **COLLSITE** "v. Rabovo, Stambolovo, Haskovo"^^xsd:string
-  **COLLNUMB** "B7E0027"^^xsd:string
-  **LATITUDE** "413738N"^^xsd:string
-  **SPAUTHOR** "L."^^xsd:string
-  **ACQDATE** "2017.00.00"^^xsd:string
-  **STORAGE** 12
-  **COLLDATE** "2017.07.05"^^xsd:string
-  **ACCENAME** "Local"^^xsd:string
-  **SAMPSTAT** 300
-  **NICODE** "BGR"^^xsd:string
-  **CROPNAME** "Eincorn"^^xsd:string
-  **SUBTAUTHOR** "Koern"^^xsd:string
-  **ACCENUMB** "2017-TRT-MC-5"^^xsd:string

Negative object property assertions 

Evaluation characteristics

EvCh-2017-TRT-MC-5 — <http://www.semanticweb.org/astoyanova/ontologies/2020/1/GenBank#EvCh-2017-TRT-MC-5>

Description: EvCh-2017-TRT Property assertions: EvCh-2017-TRT-MC-5

Types +

- PoaceaeEvaluationCl

Same Individual As +

Different Individuals +

Object property assertions +

Data property assertions +

- Number_of_brothers "max: 4-5 brothers"^^xsd:string
- Sustainability "It has high field resistance to brown, black and yellow rust and powdery mildew."^^xsd:string

Negative object property assertions +

Negative data property assertions +

Annotation properties


The screenshot displays a web ontology editor interface. On the left, a class hierarchy is shown for *C. colocynthis*, listing various plant species. The right panel shows the annotations for *C. colocynthis*, including comments in Bulgarian and English, an image of melons, and a list of synonyms.

Class hierarchy: C. colocynthis

- Avena
- Bambusa
- Berberis
- Bergenia
- Beta
- Betula
- Bistorta
- Boehmeria
- Brassica
- Bromus
- Broussonetia
- Bruckenthalia
- Bryonia
- Cakile
- Calepina
- Calluna
- Caltha
- Camellia
- Cannabis
- Capsella
- Cardaria
- Carpinus
- Carya
- Castanea
- Celosia
- Celtis
- Cheiranthus
- Cheidonium
- Chenopodium
- Chloris
- Cinnamomum
- Citrullus
- C. colocynthis**
- C. lanatus
- Clematis
- Consolida
- Corydalis
- Corylus
- Crassula
- Cucumis
- Cucurbita

Annotations: C. colocynthis

Annotations +

- rdfs:comment** [language: bg]
Колоцинт, горчива диня
- rdfs:comment** [language: en]
Abu Jahl's melon
- schema:image**

- Synonyms** [language: en]
Citrullus colocynthoides Pangalo
Citrullus pseudocolocynthis M.Roem.
Colocynthis officinalis Schrad.
Colocynthis vulgaris Schrad.
Cucumis colocynthis L.

Description: C. colocynthis

Equivalent To +

Sub-Class Of +


- Citrullus**
- Species**

General class axioms +

SubClass Of (Anonymous Ancestor)

- Familia** or **SubFamilia**
- hasEvaluationCharacteristics** some **Evaluation_characteristics**

User Interface



☰ Регистратор на Образци

Образци

Роли

Потребители

Държави

Институти

Таксономия

Експедиции

Кураторски колекции

Оценъчни характеристики

Изход

Основни данни
Репродукции и съхранение
Забележки
Експерименти

Европейски номер *

Име на образец

Таксономия *

Институт

Каталожен номер

Култура

Дата на регистрация *

Държава

Местоположение

Дата на колекциониране

Източник на Събиране

MLS статус AEGIS статус Поддържа се активно

Селекционен институт

Биологичен статус

Родословие

Род

Вид

Автор на вида

Каталожен номер

BGR номер на съхранение

Биологичен статус

Източник на колекциониране

Тип на съхранение

Регистриран между

MLS статус

AEGIS статус

Европейски номер

Име на образца

Култура

Държава на произход

Институт

Населено място

Надморска височина от М. Надморска височина до М.

Дата на колекциониране

Европейски номер	Таксономия	Име на образец	Култура	Действие
1956-TRT-DU-1	род: Triticum; вид: durum;	LOCAL	durum wheat	<input type="button" value="i"/> <input type="button" value="p"/> <input type="button" value="d"/>
1957-TRT-DU-100	род: Triticum; вид: durum;	LOCAL	durum wheat	<input type="button" value="i"/> <input type="button" value="p"/> <input type="button" value="d"/>
1957-TRT-DU-101	род: Triticum; вид: durum;	LOCAL	durum wheat	<input type="button" value="i"/> <input type="button" value="p"/> <input type="button" value="d"/>
1957-TRT-DU-102	род: Triticum; вид: durum;	LOCAL	durum wheat	<input type="button" value="i"/> <input type="button" value="p"/> <input type="button" value="d"/>
1957-TRT-DU-104	род: Triticum; вид: durum;	LOCAL	durum wheat	<input type="button" value="i"/> <input type="button" value="p"/> <input type="button" value="d"/>
1957-TRT-DU-105	род: Triticum; вид: durum;	LOCAL	durum wheat	<input type="button" value="i"/> <input type="button" value="p"/> <input type="button" value="d"/>



Институти

Код	Име	Държава	Акроним	Тип	Д.	С.	К.	Б.	Email	url	Улица
AFG001	Plant Genetic Resources Unit, Crop Improvement Division, Ministry of Agriculture	Afghanistan	PGRU	Governmental	true						
AFG002	Agriculture Research Institute of Afghanistan	Afghanistan	ARIA	Governmental	false	true	false	false			
AFG003	Faculty of Agriculture, Kabul University	Afghanistan		Governmental							
AFG004	FAO Representation	Afghanistan	FAO	United Nations					FAO-PAK@field.fao.org		P.O. Box 1476
AFG005	United Nations Development Programme	Afghanistan	UNDP	United Nations							P.O. Box 5
AFG006	Ministry of Agriculture Irrigation and Livestock	Afghanistan		Governmental						http://mail.gov.af	
AGO001	Institut de Recherche Agronomique	Angola	IIA	Governmental							CP 406
AGO002	Centre de Recherche Scientifique sur le Coton, Institut du Coton d'Angola	Angola		Governmental							
AGO003	Station Expérimentale	Angola		Governmental							
AGO004	Station Expérimentale	Angola		Governmental							
AGO005	Comité National sur les Ressources Phytogénétiques, Département de Biologie, Faculté des Sciences, Université Agostinho Neto	Angola	NPGR	Governmental					ftogen@ebonet.net		CP 815, Av. 4 Fev
AGO006	Direction Nationale pour la Production Agricole										
AGO007	Faculté des Sciences, Université Agostinho Neto										
AGO008	Représentation de la FAO										
AGO009	PIAUD										
AGO011	Institut de Recherche Agronomique, Ministère de l'Agriculture et du Développement Rural										
AGO012	Centre national des ressources phytogénétiques, Ministère de l'Agriculture et du Développement Rural										
AGO013	Luanda Herbarium, Universidade Agostinho Neto										
ALB001	Plant Breeding/Seed Production Section, Department of Agronomy, Agriculture University of Tirane										
ALB002	Agricultural Research Institute										
ALB003	Agricultural Research Station										
ALB004	Research Institute for Olive and Citrus Trees										
ALB005	Sugar Beet Station										
ALB006	Maize and Rice Research Institute										
ALB007	Forage Research Institute, Food and Agriculture Ministry										
ALB008	Research Institute of Fruit Trees and Vineyard										
ALB009	United Nations Development Programme										
ALB010	Manitobian and Potato Institute										

Образи

Роли

Потребители

Държави

Институти

Таксономия

Експедиции

Кураторски колекции

Оценъчни характеристики

Изход



Образи

Роли

Потребители

Държави

Институти

Таксономия

Експедиции

Кураторски колекции

Оценъчни характеристики

Изход

Род

Фамилия

Добави Промени Премахни

Име	Код	Синоним	Локално Име
Alacariaceae	ANC		Сирадликови
Arceuthaceae	ARC		Зимзелени
Apiaceae	API	Umbelliferae (Poleminiacae)	Семноцвелни
Araceae	ARA		Змиричкови
...	...		
129			

Родове

Добави Промени Премахни

Име	Код	Локално Име	Фамилия	Под Фамилия
Triticum				
triticum	TRT	Пшеница	Росеее	

Taxon Authority

Добави Промени Премахни

ИМЕ
(Aet.) Mansf
(Duch.) Lam.& DC.

Подфамилия

Добави Промени Премахни

ИМЕ	Фамилия
o	

Видове

Добави Промени Премахни

ИМЕ	Род	TaxonAuthority
aegilopoides	Triticum	UNKNOWN
aestivum	Triticum	L



Conclusions

- Gene Bank System is available in <https://genbank.uni-plovdiv.net/>
- Implementation:
 - Maria DB
 - Protégé
 - Java
 - Vaadin
 - JADE



Thank you!

