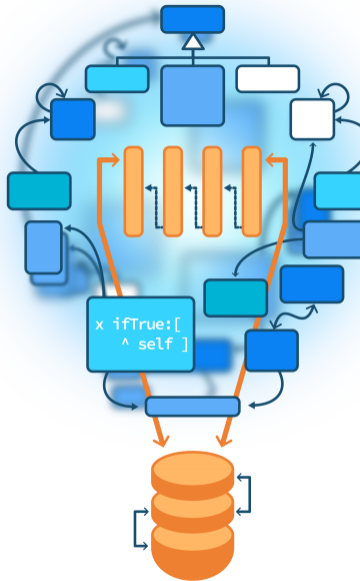# TypeObject

S.Ducasse, L. Fabresse, G. Polito, and P. Tesone

Goals

- Individuals and their description
- Another form of sharing
- TypeObject

Analysing a case

- Imagine that you have a cactus collection and you want to manage them
- There is a difference between one plant and its kind

Gymnocalycium mihanovichii (a south american well known cactus)

An individual vs. its description

- You can several G. Mihanovichii and each one can be different
- Different flowers, pest attacks, ...

Still one description of their kind

Gymnocalycium mihanovichii (Chin Cactus)

Advertisements **Scientific Name**

Gymnocalycium mihanovichii (Fric ex Gürke) Britton & Rose

Common Name(s)

Chin Cactus, Plaid Cactus

Synonym(s)

Echinocactus mihanovichii, Gymnocalycium friedrichii

Scientific Classification

Family: Cactaceae
**Subfamily:** Cactoideae
Tribe: Trichocereeae
Genus: *Gymnocalycium*

Description

Gymnocalycium mihanovichii is a dwarf cactus with a solitary spherical stem with deep ribs and prominent roller-shaped thickening around areoles that bear clusters of sharp spines. It is very variable in the distribution and arrangement of spines and the color of the flowers. The stem slowly grows to 1.6 inches (4 cm) tall and 2.4 inches (6 cm) in diameter. The silky flowers range from white, yellowish-white, and pale green

Video Rental

- There is a difference between a video description and the actual BlueRay you have in your hand.
- The description describes all the RamboIII Blueray
- A given blueray can be scratched and its box broken
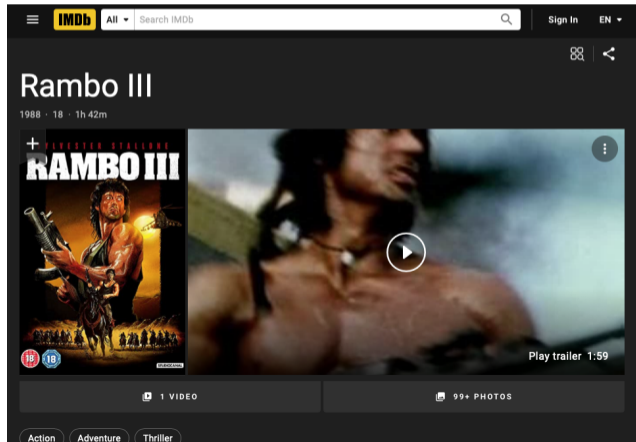
How to implement this?

- Should we implement all the descriptions on the class level?
- Should we have a separate class?

All in class level

- Putting all the description information at the class level could work
  - Cannot change dynamically
  - Our instance can get big easily
  - Duplicated information in all instances
  - Cannot be shared between different kinds of objects

TypeObject

- Introduce a TypeObject whose responsibility is to gather description-specific properties
- PlantDescription vs Plant
- We can share the description instance
- Information is not repeated in many objects

```
┌──────────────┐         ┌──────────────────────┐
│    Plant     │────────▶│   PlantDescription   │
└──────────────┘         └──────────────────────┘
```
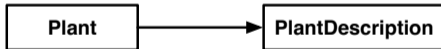
TypeObject (II)

- Define instance-specific properties in typed object class
- Define instance description specific properties in the `TypeObject` associated with the typed Object

Plant
  age, size, lastPestAttack, flowerColor

PlantDescription
  otherNames, countries, cultivars

Dynamic TypeObjects

- Depending on your domain the typed object and TypeObject relationship can be dynamic
- The description evolves with the program
- Changing one description affects all described instances

Conclusion

TypeObject:

- makes explicit the relation to the object description
- encapsulates state and behaviour that is common to a type of objects
- is a dynamic way of handling descriptions

Advanced Object-Oriented Design and Development with Pharo

A course by
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