

Specification: Introduction of Plots as a new object

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Role	Name	Date
Business Analyst	Zeno Trevisan	20.03.2022

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Context

Currently a plantation is defined as an own object representing all the land that is controlled by a single farmer. This needs to change in a way that a new level as a plot will be introduced which is a sub-structure of the plantation. This specification shall detail how the changes need to be applied to Odoo for this new requirement.

Definition

Plantation : All the land, consisting of 1 ... n plots which in their entirety represent the total area that is allocated and can be cultivated by a specific farmer

Farm : the term is used as a synonym and thus interchangeably with plantation. For the purpose of the implementation for Caboz, the term Plantation is preferred.

- Plot : a plantation is divided in to 1 ... n plots. A plot represents an area of land which can be cultivated by one specific farmer
- Farmer : a person who cultivates plots and may do so on 0...n plots belonging to one or several different plantations
- Owner : a person who has ownership of 0...n plots
- Leaser* : a person who has leased a plot to a farmer
- Employee : a person in a working relationship with a farmer

* Currently, Lease as a type of relationship will not be implemented. It is only mentioned in order to keep in mind, that in the long run the model might need to be extended.

New Structure

A new object needs to be introduced to Odoo which represents a plot. The parent object of a plot is the plantation which already exists. A plantation can consist of 1...n plots which can be attached to a plantation.

Object attributes

Plantation attributes

The following attributes are available for the plot:

Attribute	Datatype	Description	User editable	Mandatory	Unique
Id	Odoo standard	Primary key	No	Yes	Yes
Reference	String	Business Reference	Yes	Yes	Yes
Farmer	Foreign Key	Reference to an Odoo Partner denoting the person who cultivates the plantation as a farmer	Yes	Yes	No
tbd					
Region	Foreign Key	Reference to the geographical region where the plantation is situated	Yes	Yes	No

Section	Foreign Key	Reference to the internal section to which the plantation belongs	Yes	Yes	No
Number of plots	?	Number of plots belonging to the plantation	No	Yes	No
Total surface	?	Sum of the surfaces of all plots			
Centrepoint	?	Geographic centrepoint of the plantation			

Plot attributes

The following attributes are available for the plot:

Attribute	Datatype	Description	User editable	Mandatory	Unique
Id	Odoo standard	Primary key	No	Yes	yes
Name	String	Name of the plot, can be changed	Yes		
Code	String	Code to identify the plot	Yes	yes	yes
Type	String	Type of plot which can be selected by the user from a list of possible values that can be maintained by an administrator	Yes	Yes	No
Owner	Foreign Key	Reference to an Odoo Partner, denoting the relation of type ownership by a Partner	Yes	No	No
Plantation	Foreign Key	Reference to an Odoo Object Plantation	Yes	No	No
Area Polygon	Polygon	GPS geo data describing the plot	Yes	No	Yes

Area	?	Automatic calculation of the area based on the GPS polygone			
Location	Geo coordinates	Locating the center of a plot	Yes	No	yes
Product	1..n Relationship to product	Reference(s) to cultivated, commercial product	Yes	No	No
Intervention*	1..n Relationship	Reference to interventions e.g. to improve productivity	Yes	No	No
current_rec	Boolean	True/false indicator to flag the currently valid record based on validity period. For any given plot only one record at any time can have the flag set to true.	No		No
valid_from	Date in the format dd/mm/yyyy	Start of validity of record	yes		
valid_to	Date in the format dd/mm/yyyy	End of validity of record	Yes		
Active	Boolean	Active / Inactive flag to denote if the plot is still actively controlled by the system.	yes		

*interventions will only be implemented at a later state

As auxiliary objects, the plot type needs to be introduced to Odoo. This should be a list of possible values that can be configured and administrated by authorized users.

Migration to the new structure

After the initial implementation following steps need to be processed, ideally as part of the implementation process as it can possibly be automated:

1. Data on existing plots should be imported from Excel and the initial generation of the plots and creation of corresponding plantations be processed and allocated to respective farmers.
2. Also the geo data currently available needs to be imported into the plots.

Historisation

Changes to the attributes on the plot as well as on the plantation need to be historized such that time series analysis can be supported. Hence, the plot objects, their creation, modification and deletion must be treated in a special way to enable time series analysis. Fundamentally, no deletions are allowed, modifications must result in new versions of the records and all records need special time fields in order to allow for time series analysis.

Possible actions on a PLOT

User entry validations

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Creation of a new plot

These steps need to be followed:

1. An initial version of the plot record is created and the valid_from date set to either the current date or a date to be entered by the user.
2. An initial owner is set as defined by the user on the new record
3. The plot must be attached to an existing plantation or the option to create a new plantation must be offered by the GUI
4. A valid_to date far in the future is set on the new record (e.g. 2199/12/31)
5. If the new record has immediate validity (and so valid_from date =< now()), current_rec flag is set on the new plot record to true.

Change of ownership

These steps need to be followed:

6. A new version of the plot record is created and the valid_from date set to either the current date or a date to be entered by the user.
7. The new owner is set as defined by the user on the new record

8. A valid_to date far in the future is set on the new record (e.g. 2199/12/31)
9. The previous record is modified by setting the valid_to date to the first calendar day prior to the valid_from date of the new record.
10. If the new record has immediate validity (and so valid_from date =< now()), current_rec flag is set on the new record to true and on the previous record to false

Change of plantation

These steps need to be followed:

1. A new version of the plot record is created and the valid_from date set to either the current date or a date to be entered by the user.
2. The new plantation is set as defined by the user on the new record
3. A valid_to date far in the future is set on the new record (e.g. 2199/12/31)
4. The previous record is modified by setting the valid_to date to the first calendar day prior to the valid_from date of the new record.
5. If the new record has immediate validity (and so valid_from date =< now()), current_rec flag is set on the new record to true and on the previous record to false

Change of area by splitting the plot

A change of size with the exception of a correction of wrong geo data is not a valid action, instead, the user needs to be offered the option to inactivate a plot.

These steps need to be followed:

1. The user initiates an inactivation of the plot and optionally enters a validity date upon which the inactivation becomes active.
2. A new version of the plot record is created and the valid_from and valid_to date are set to either the current date or a date entered by the user under 1).
3. The new record of the plot is marked as inactive
4. The previous record is modified by setting the valid_to date to the first calendar day prior to the valid_from date of the new record.
5. If the new record has immediate validity (and so valid_from date =< now()), current_rec flag is set on the new record to true and on the previous record to false

Change of area by correction of geo data

This is a special case and possibly the action should only be allowed by specially authorized roles. A warning must be given to the user attempting the modification to explicitly confirm the action being a modification of wrong geo data.

1. The modification on the polygon data is executed without generation a new version of the plot object.

Plot Housekeeping

A periodically scheduled process is required to manage the `current_rec` flag. The following logic is applied:

1. For every record where `current_rec` is false and `now() >= valid_from date`, the `current_rec` flag needs to be set to true.
2. For each of these records it needs to be checked if there exists a predecessor record with validity period immediately prior to the record found under 1) and a `current_rec` flag which is true. If such a record exists, the `current_rec` flag on the predecessor record must be set to false.
3. If no predecessor exists, we assume it is a new plot and only the `current_rec` on the single record needs to be set to true according to step 1).
4. For every record that has the `current_rec` set to true, a check for reaching the `valid_to date` on each record is necessary. If the `valid_to date` has been reached, the setting of the `current_rec` flag is set to false.
5. If a successor record already exists for any record found under 5) with a corresponding `valid_from date <= now()`, the `current_rec` flag of this record is set to true.

It needs to be noted, that the modification just of the `current_rec` flag does not initiate a new version of the record and hence, if only the `current_rec` flag is changed, this does not trigger a processing of the record modification as described in this section.

If no new record exists to become the new current record, a report or list of those records should be made available to the user in order to decide and if possible, entering of new current records can be issued.