

Reviewing And Updating The Comments of The Irrigation system For Strawberry Crop In Open Field (STRAWBEX)

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1. Introduction

This reviewing report is based on the verification report (TR/CLAES/211/2001.4)

The activities used to produce this report are as follows:

1. Reviewing design report.
2. Reviewing design report versus implementation report.
3. Reviewing implementation report versus source code
4. Reviewing testing usability of the system.

For each topic in this report, the reviewing comments appear in *italic* and **boldface**.

2. Reviewing Requirement Specification Report Versus Design Report

No requirement specification report was issued.

3. Reviewing Design Report

3-1 Domain Knowledge

3-1-1 Ontology

3-1-1-1 Conceptual View

- In figure 4 the node called “straberry” should be changed to “strawberry”.

Comment: this comment will be solved during the integration with all the subsystems.

- In figure 4 the property “tomato type” of the concept “vegetable” should be deleted.

Comment: this comment will be solved during the integration with all the subsystems.

- In figure 5 the properties “date” and “method” of the concept operations should be deleted.

Comment: this comment will be solved during the integration with all the subsystems.

- In figure 6 the property “quantity” of the concept “organic manure” should be deleted.

Comment: this comment is not valid; the property is not deleted from the design and used.

3-1-1-2 Ontology Specification

3-1-1-2-1 Plantation Ontology

Concept

- The following Concepts should be deleted or updated :
 - tomato, tomato_open_field, tomato_low_tunnel.

Comment: the design will be updated during the integration with all the subsystem; the concepts will be deleted.

- The concept Strawberry should be added.

Comment: there is no need to add the concept

- The property “tomato_type” of the concept vegetable should be deleted instead of the concept “tomato type”.

Comment: this comment will be solved during the integration with all the subsystems; this note will be updated in the design.

- The VALUE_LIST of the property “type” of the concept “vegetable” should be changed:

<u>From</u>	<u>To</u>
Streberry	Strawberry

Comment: this comment will be solved during the integration with all the subsystems.

Relation

- The relation tomato_type_r should be deleted or updated.

Comment: this comment will be solved during the integration with all the subsystems; the relation will be deleted from the design.

- The relation growth_stage should be changed to growth_stage_r.

Comment: this comment will be solved during the integration with all the subsystems; the relation name will be updated in the design.

3-1-1-2-2 Operations Ontology

No error.

3-1-1-2-3 Material Ontology

No error.

3-1-1-2-4 Disorder Ontology

Should be deleted.

Comment: this comment will be solved during the integration with all the subsystems; this part will be deleted from the design.

3-1-1-2-5 Plantation_factors Ontology

Relation

- Relation “variety_characteristic_basis_r” has been updated but there is no any update for it.

Comment: this comment will be solved during the integration with all the subsystems; the updating of the relation will be mentioned in the design.

Table

- Input parameters of the table “optimal_quantity_of_organic_manure_t” should include soil.type to be matched with the table column.

Comment: this comment will be solved during the integration with all the subsystems.

- Table efy_t should be deleted or changed according to strawberry variety.

Comment: this comment will be solved during the integration with all the subsystems; the table will be updated.

Function

- Long_width_basis_f should be deleted because it depends on high_tunnel.

Comment: this comment will be solved during the integration with all the subsystems; the function will be deleted from the design.

- Normal_dimension_f should be deleted because its parent concept has been deleted.

Comment: this comment will be solved during the integration with all the subsystems; the function will be deleted from the design.

- Variety_name_basis_f calculated from efy should be deleted or updated.

Comment: this comment will be solved during the integration with all the subsystems; the function will be deleted from the design.

- Evaluation_quantity_f is based on the calculation of the deleted property “quantity” of the concept “organic_manure”.

Comment: this comment is not valid, there is no mention in the design that the property is deleted.

3-1-1-2-6 Computational Ontology

3-1-1-2-6-1 et0 ontology

Concept

- Concept et0 should be defined as subtype of eta according to conceptual view (see Fig 10).

Comment: Concept et0 depends on the concept eta according to figure 10, and is not a subtype of it.

Relation

- Relation et0_penman_pcf is based on the calculation of the deleted concepts: l_rh_n, m_rh_n, h_rh_n.

Comment: this comment will be solved during the integration with all the subsystems; the concept name will be updated to “l_rh_c, m_rh_c, h_rh_c” respectively in the design.

- Relation control_f_r calculate the value of control_f which is deleted (its parents are deleted).

Comment: the relation will be deleted from the design during the integration with all the subsystems

- et0_penman_pcf relation uses task_parameters concept which is not defined.

Comment: this comment will be solved during the integration with all the subsystems; the concept will be defined.

- Control_f_r uses task_parameters concept which is not defined.

Comment: this comment will be solved during the integration with all the subsystems; the concept will be defined.

Function

- Function smooth_et0_pennman_f should be deleted because its concept is deleted.

Comment: this comment will be solved during the integration with all the subsystems; the function will be deleted.

3-1-1-2-6-2 eta ontology

Relation

- In the relation unit_factor_r, the value of unit_factor (= 4200) is out of range.

Comment: the range is not given in the design, it will be added in the design during the integration with all the subsystems.

3-1-1-2-6-3 pawc ontology

Table

- ad_t and max_rd_t tables should be deleted because their input depend on tomato type.

Comment: the two tables will be deleted from the design during the integration with all the subsystems.

Function

- Report require to update rd_f, ad_f functions which are not found.

Comment: the functions are added to the design, a modification for function rd_f will be mentioned in the design during the integration with all the subsystems

- The following functions should be deleted because they are calculated from the deleted concept max_rd:
 - rd_init_st_d_f, rd_init_st_f_f, rd_veg_st_d_f, rd_veg_st_f_f, rd_fl_st_d_f, rd_fl_st_f_f, rd_fr_st_f.

Comment: this comment will be solved during the integration with all the subsystems; the functions will be deleted.

3-1-1-2-6-4 Interval ontology

Function

- The following functions should be deleted because their concepts are deleted:

Function	Concept
their_is_irrigation_today_f	their_is_irrigation_today
their_is_no_irrigation_today_f	their_is_no_irrigation_today

Comment: this comment will be solved during the integration with all the subsystems; the functions will be deleted.

3-1-1-2-6-5 water_requirement ontology

There is no modification.

3-1-1-2-6-6 Accumulated-eta ontology

There is no modification.

3-1-1-2-6-7 Irrigation_units ontology

Relation

- Irrigation_type_r and no_of_irrigation_during_day_r relations have used the undefined concept irrigation_schedule concept.

Comment: this comment will be solved during the integration with all the subsystems; the concept will be defined.

Function

- Intake_h_f have used the concept intake_g which is not defined.

Comment: the correct concept name is intake_h, so the function will be updated in the design during the integration with all the subsystems.

3-2 Inference Knowledge

- In the method of inference step “revise” the mechanism_selector should call interval_revised_model instead of interval_model and water_requirement_revised_model instead of the water_requirement_model.

Comment: the design will be updated during the integration with all the subsystems.

3-3 Task Knowledge

- In the main task (irrigation schedule), there is a definition of the procedure verify which is deleted.

Comment: this comment will be solved during the integration with all the subsystems; the procedure will be deleted.

- In the subtask “propose”, the “irrigation_weekly_schedule” is defined as procedure, while it is a subtask.

Comment: this comment will be solved during the integration with all the subsystems.

- In the *revise* subtask the control-structure is missed.

Comment;; the control structure will be added in the design during the integration with all the subsystems.

- The initialization_last_irrigation procedure is not used.

Comment: this comment will be solved during the integration with all the subsystems; the procedure will be deleted.

4. Reviewing Design Report Versus Implementation Report

4-1- Domain Knowledge

4-1-1 ONTOLOGY

- In the implementation report the data base name should be changed from tomatexdb to strawbexdb.

Comment : this comment will be considered during the integration with all the subsystems

- The source of value of the following properties are tables, but they have different names in the design different from implementation:

Properties name	Design	Implementation
Climate.ra_par_a	ra_t	ra_t_a
Climate.ra_par_b	ra_t	ra_t_b
Climate.msh_par_a	msh_t	Msh_t_a
Climate.msh_par_b	msh_t	Msh_t_b
Ad_f1.value	Ad_f1	Ad_f1_t
Ad_f2.value	Ad_f2	Ad_f2_t

Comment: The implementation is true; the design will be updaed during the integration with all the subsystems.

- The following properties are defined in the implementation report but are not defined in the design report:

	Concept name	Properties name
1	current_planting	optimal_no_plant
2	organic_manure	quantity
3	farm_factors	value
4	Current_plant_factor	value
5	Intensity_of_plants	value
6	Low_tunnel_&_open_field_intensity	Value, visited
7	Number_of_plants_basis	Value, visited
8	d_b_plants_&_d_b_rows_basis	Value, visited
9	optimal_number_of_plants_factor	Value
10	optimal_no_of_plants	Value, visited

	Concept name	Properties name
11	optimal_no_of_plants_depend_on_variety	Value, visited
12	Drainage_system_factor	Value
13	organic_manure_factor	Value
14	Hypothetical_or_concentration	Value
15	Actual_or_concentration	Value
16	Evaluation_absent	Value, visited
17	Evaluation_quantity	Value, visited
18	Optimal_quantity_of_organic_manure	value
19	Et0_penman	Value, visited
20	L_rh_c	Value
21	M_rh_c	Value
22	H_rh_c	value
23	Depression_factor	Value
24	Unit_factor	Value
25	Ad_r	Value
26	Ad	value
27	Ad_f1	Value
28	Ad_f2	Value
29	Sp_factor	Value, visited
30	Sp_l	Value
31	Sp_h	Value
32	Weekly_basis_interval	Value, visited
33	Interval_weekly	value
34	User_suggested_interval_weekly	Value
35	Adaptive_ir	Value
36	Ir	Value
37	Ece	Value
38	Water_used	Value, visited
39	Water_used_weekly	value
40	State_one	Value
41	State_two	Value
42	State_three	Value
43	State_four	Value
44	Irrigation_type	Value_n
45	Motors_hours_work	Value
46	No_of_irrigation_during_day	value
47	Intake	Value,visited
48	Intake_l	Value
49	Intake_h	value
50	Kc	value
51	Gc	value

	Concept name	Properties name
52	Rd_r	Value
53	Rd	value
54	Rd_f1	Value
55	Rd_f2	value
56	Variety_factor	value

Comment:

Point1: the property will be added to the concept in the design during the integration of all the subsystems.

Point2: the property already exists in the design and implementation.

Point 3 to point 39: the properties are defined in the design for the parents of these concepts; so it is inherited from the parent.

Point 40 to 43: the concepts will be deleted from the implementation.

Point 44 to 56: the properties are defined in the design for the parents of these concepts; so it is inherited from the parent.

- The following properties are defined in the design report but are not defined in the implementation:

Concept name	Property
Eta	Visited
Pawc	Visited
Water_requirement	Visited
Irrigation_units	value, value_n

Comment : *these properties are deleted from these concepts in the implementation and added in the sons of these concepts that need to use this property, so the design will be updated according to this change during the integration with all the subsystems.*

- In the implementation report the source of value of the following properties should be changed:

Property name	from	to
Low_tunnel_&_open_fi	intensity_of_plants	Low_tunnel_&_open_fie
eld_intensity.visited	_pcf	ld_intensity_pcf
Rd_f2	Function(rd_f2_t)	table(rd_f2_t)

Comment : implementation is true, the source of value will be added to the properties in the design, so the design will be updated according to this change during the integration with all the subsystems.

- The source of value of the following properties is defined in the implementation report different from design report:

Property name	Implementation	Design
Sp_factor.visited	Sp_factor_pcf	
Interval.visited	Interval_pcf	
Weekly_basis_interval.visited	Weekly_basis_interval_pcf	Interval_pcf
Water_used.visited	Water_used_pcf	
Accumulated_eta.visited	Accumulated_eta_pcf	
Irrigation_units.visited	Irrigation_units_pcf	

Comment:

point1,2,4,5: the source of value is mentioned as an axiom in the design report (72) for the concept, the source of value of the property will be added in the design during the integration with all the subsystems.

Point 3: the source of value is mentioned in the design as an axiom in the design report (72) for the concept and map to the implementation(implementation is correct), so , the source of value of the property will be added in the design during the integration with all the subsystems.

Point 6: , the source of value of the property will be added in the design during the integration with all the subsystems.

- The following properties are defined as necessary in the implementation report but are not in the design report:

Concept name	Properties name
Soil	Texture
Vegetable	Variety, type

Comment : implementation is true, the design will be updated according to this change during the integration with all the subsystems.

- The upper limit of the following properties are defined in the implementation report different from the design:

Properties	Design	Implementation
Current_planting.no_of_plants	2000	20000
Water_requirement.value	1000	10000

Comment : implementation is true, the design will be updated according to this change during the integration with all the subsystems.

- The lower limit of the following property is defined in the implementation different from the design:

Properties	Design	Implementation
Farm.area	1	0

Comment : design is true, the implementation will be updated.

- The concept name in the design is different from the implementation:

Concept name in design	Concept name in implementation
Low_tunnel&open_field	Low_tunnel_and_open_field

Comment : implementation is true, the design will be updated according to this change during the integration with all the subsystems.

- The following property is defined as necessary in the design report but not defined in the implementation report:

Concept name	Properties name
Irrigation	Controlled_water

Comment : design is true, the implementation will be updated.

- The source of value of the following property is defined as user in the design, but as DB in the implementation:

Concept name	Properties name
Irrigation	Schedule_type

Comment : implementation is true, the design will be updated according to this change during the integration with all the subsystems.

- The following concepts are defined in the implementation report, but are not defined (or deleted) in the design report:

1. task_parameters

Comment : implementation is true, the concept will be defined in the design during the integration with all the subsystems.

2. evaluation_result

Comment : design is true; the concept will be deleted from implementation

3. Recommendation

Comment : design is true; the concept will be deleted from implementation

4. initial_irrigation_schedule

Comment: the concept will not be deleted because it may be used during the integration of all the subsystems.

5. irrigation_schedule

Comment : implementation is true, the concept will be defined in the design during the integration with all the subsystems.

6. irr_db

Comment : the concept will be deleted from the implementation.

7. et0_hargerve (deleted)

8. smooth_et0_hargerve (deleted)

9. et0_har_c (deleted)

10. et0_har_n (deleted)

11. control_f (deleted)

Comment : the design is true, these concepts and its relations and functions and tables which depends on it will be deleted.

12. farm_id

Comment : implementation is true, the concept will be defined in the design during the integration with all the subsystems.

13. function_parameter

Comment : the design is true, the concept will be deleted from implementation.

gc_r
gc_f1
gc_f2

Comment : the concepts will not be deleted because it may be used during the integration of all the subsystems.

- The source of value of the property “evaluation_quantity.value” is the function evaluation_quantity_f which should be deleted because it is calculated from the deleted property “organic_manure.quantity”.

Comment : there is no mention in the design that the property is deleted; so there is no error in this point.

- The type of the following property is defined as nominal in the design report but as real in the implementation report:
interval_revised.value
water_requirement_revised.value

Comment : implementation is true, the type will be updated in the design during the integration with all the subsystems.

- The definition of node of the following concepts are defined in the implementation different from design:

Concept name	design	implementation
Irrigation_units	Node (pre_condition_function, property_of_irrigation_syst em_pcf)	Node (pre_condition_function, irrigation_units_pcf)
Kc	Node (function,kc_t)	Node (table,kc_t)
Rd_f1	Node (table,rd_f1)	Node (table,rd_f1_t)
Rd_f2	Node (table,rd_f2)	Node (table,rd_f2_t)

Variety_factor	Node(pre_condition_functi on, variety_factor_pcf)	Node (table, variety_factor_t)
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Comment : implementation is true, the design will be updated during the integration with all the subsystems.

- The super concept of the following concepts are defined in the implementation different from design:

Concept name	design	implementation
Efy	Variety_name_basis	Variety_factor
Average_efy	Variety_name_basis	Variety_factor

Comment : implementation is true, the design will be updated during the integration with all the subsystems.

- The following concepts are defined in the design but not defined in the implementation:

Previous_planting
Variety_characteristic_basis
Variety_name_basis

Comment : implementation is true, the concepts will be deleted from the design during the integration with all the subsystems.

4-1-2 Domain Model

- The rule in relation optimal_no_of_plants_r is repeated triple times in implementation and it is different from its design, so it should be changed **from**

r1 ([value(5600) in optimal_no_of_plants]) if type (open_field) in farm
--

To

r1 ([value(35500) in optimal_no_of_plants]) if type (open_field) in farm

Comment : the design is true, implementation will be updated.

- The rule in relation actual_or_cocentration is represented in implementation different from design, so it should be changed **from**

r1([visited (yes) in evaluation_quantity]) if
--


```

( organic_manure :: unknown(name/1)
; name(') in organic_manure
), ! &
r2([ visited (yes) in evaluation_absent]) if
( organic_manure :: known(name/1),
; name(_62396) in organic_manure,      (_62396\= ='') &
), ! &

```

TO

```

r1([ visited (yes) in evaluation_quantity]) if
( organic_manure :: known(name/1)
; name(_62396) in organic_manure,      (_62396\= ='') &
), ! &
r2([ visited (yes) in evaluation_absent]) if
( organic_manure :: unknown(name/1),
; name(') in organic_manure
), ! &

```

Comment : this comment is not relevant; implementation and design map to each other.

- The following relations are not found (deleted) in design but they found in implementation:
et0_hargerve_pcf (deleted)
planting_method_r
irrigation_based_on_eta_pcf (deleted)

Comment : design is true; the relations will be removed from the implementation.

- The following relation should be updated in design but it is not found:
Variety_characteristic_basis_r

Comment : the update of the relation will be mentioned in the design during the integration with all the subsystems.

- The concepts in the relation et0_pennman_pcf are defined in the design as l_rh_n, m_rh_n, h_rh_n but are defined different in the implementation: l_rh_c, m_rh_c, h_rh_c.

Comment : implementation is true, the design will be updated during the integration with all the subsystems.

- The following relations are defined in the design but not defined in the implementation:

Variety_factor_pcf

Et0_pen_c_pcf

Comment : implementation is true, the design will be updated during the integration with all the subsystems.

4-1-3 Tables

- The table ra_t is divided into ra_t_a, ra_t_b in the implementation.

Comment : implementation is true, the design will be updated during the integration with all the subsystems.

- In the implementation the table ra_t_b the row t(11,0.20383) is repeated.

Comment : editing error; implementation will be updated.

- The table msh_t is divided into msh_t_a, msh_t_b in the implementation.

Comment : implementation is true, the design will be updated during the integration with all the subsystems.

- In the implementation the first two rows of the table msh_t_a are not found in the design.

Comment : design is true; implementation will be updated.

- Tables efy_t1, efy_t2 should be changed in the design to be strawberry like implementation.

Comment : implementation is true, the design will be updated during the integration with all the subsystems.

- The following tables are found in the implementation but not found in the design:

gc_f1_t

gc_f2_t

Comment : the tables will not be deleted because it may be used during the integration of all the subsystems.

.

4-1-4 Functions

- The function init_ve_stage_f is deleted from design but it is found in the implementation.

Comment : the design is true, the function will be deleted from implementation.

- The following functions are defined in design but are not defined in the implementation:

Smooth_et0_pennman_f

State_one_f

State_two_f

State_three_f

State_four_f

Their_is_irrigation_today_f

Their_is_no_irrigation_today_f

Long_width_basis_f

Variety_name_basis_f

Comment : the implementation is true, the function will be deleted from design during the integration of all the subsystems.

4-2- Inference Knowledge

- The inference step is defined as “revise” in the design report but defined as “revise_irrigation_schedule” in the implementation.

Comment : implementation is true; the design will be updated during the integration of all the subsystems.

4-3- Task Knowledge

- The following subtasks are found in the implementation but are not found in the design:

Evaluate
Recommend

Comment : the design is true, the subtasks will be deleted from implementation.

- In the implementation the verify_and_fix does not defined inside an object.

Comment : this part will be deleted from implementation.

- In the implementation the subtask revise contains revise_loop while it has not in the design.

Comment : the implementation is true.

- In the implementation, the transfer task output_irrigation_schedule does not map to design.

Comment : the implementation is true.

- In the implementation, procedure get_missed_data does not map to design.

Comment : the implementation is true.

- The words for :trace, should be deleted from implementation.

Comment : the implementation will be updated.

4-4- User Interface

There is no difference.

5. Reviewing Implementation Report Versus Source Code

5-1 Domain Knowledge

Ontology

- There are no differences between source code and implementation report.
- The following concepts do not have any attributes in both source code and implementation report

Concept	Page number
Irr_db	21
Verify_plantation	21

Comment : the implementation will be updated, concepts will be deleted.

- The type of the attribute “water_requirement” of the concept “initial_irrigation_schedule” hasn’t been specified.

Comment : the source is user as default source of value, a prompt is mentioned for this property.

Domain Model

- There is no difference.

Tables

- There is no difference.

Functions

- There is no difference.

5-2 Inference Knowledge

- There is no difference.

5-3 Task Knowledge

- There is no difference.

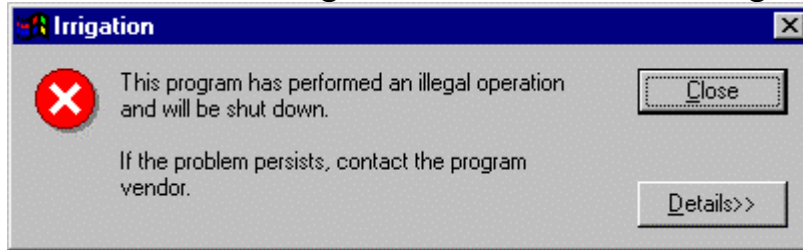
5-3 Interface

- There is no difference.

6. Reviewing the usability of the system

General Test

- When session running is finished this error message appear.



Comment: this error did not appear in the version I have in my computer.

Test cases

- In cases 1 and 5 the first two windows are reversed in the implementation report.

Comment: this comment will be considered during the integration of all the subsystems; test cases will be updated.