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Reviewing and Updating the Comments of Diagnosis Expert System of Melon

1. Introduction

This report is the response to the comments mentioned in the report number TR/CLAES/192/2001.1. The response is written in bold and italic after each comment.

2. Requirement Specification Report Versus Design Report

No requirement specification report was issued.

3. Design Walkthrough

3-1 Domain Knowledge

Domain Ontology

1. Domain Taxonomy

- No error

2. Domain Typology

- The possible value of the following properties should be reordered (Arabic problems)

Leaves: spots color
Leaves: appearance

These possible values will be updated in the design.

- There is typing error in the following property and should be changed

From	To
Fruits: ppearance	fruits: appearance

The above property will be updated in the design.

Domain Model

- The following value is duplicated in the R.H.S of the rule no 1 in page 7

Disorders:suspected = نقص نيتروجين

This value is not true but the value duplicated is Disorders: suspected = نقص فوسفور and will be updated in the design.

- There are differences in the name of the following properties between domain ontology and domain model and should be changed:

From	To	rules

leaves: appearance status	leaves: appearance_status	rule 2 in page 8 rule 4 in page 8 rule 3 in page 11 rule 5 in page 11 rule 3 in page 14 rules 4,5,6 in page 15
stem: spot color	stem: spots color	the last rule in page 10 rule 2 in page 11
stem: spot appearance	stem: spots appearance	the last rule in page 10 rule 2 in page 11
stem spot: color	stem:spots color	1st rule in page 11
leaves tunnel: color	leaves: tunnel color	rule 3 in page 15

All names of the properties will be updated in the design according to the above changing.

- There are differences in the values of the RHS of the rule in the domain model and possible values in the domain ontology and should be changed:

From	To	rules
stem: color = مبقعة	stem: color = مبقع	rules1st rule in page 11
leaves: color position = الورقة كله	leaves: color position = الورقة كلها	rules1st rule in page 12 rules 3,4 in page 13

The values of the RHS of the rule in the domain model will be updated according to the possible values in the domain ontology.

- Parenthesis should be corrected for the following rules:

Page	rules no.
9	4
10	2
14	4
15	2

All the above rules will be updated in the design.

- The rule 5 in page 12 should be changed as follows

From	To
(disorders: suspected = نقص فوسفور & leaves: appearance status = غير طبيعى leaves: color position = لطشة كبيرة فى وسط الورقة & ((leaves: appearance status = غير طبيعى & leaves: appearance = ذبول الأطراف العلوية للأوراق) OR leaves: appearance status = طبيعى)	(disorders: suspected = نقص فوسفور & leaves: color position = لطشة كبيرة فى وسط الورقة & ((leaves: appearance_status = غير طبيعى & leaves: appearance = ذبول الأطراف العلوية للأوراق) OR (leaves: appearance_status = طبيعى & leaves: color direction = من أعلى الى)

& leaves: color direction = (من أعلى الى أسفل CONFIRM (disorders: value = نقص فوسفور)	أسفل)) CONFIRM (disorders: value = نقص فوسفور)

This rule will be updated in the design according the above changing.

3-2 Inference Knowledge

- The following specification has some unclear descriptions. Comments are written along with their occurrences.

Inference: predict

Static roles should be change the term

From PREDICT ∈

To SUSPECT∈ prediction model.

Spec should be changed

From by applying "PREDICT" relation.

To by applying "SUSPECT" relation.

Inference: differentiate

Spec: it loss "confirm relation" at the end of the sentence.

Inference: Generate observations

Spec: It loss the following line after "by using"

confirm relation. The generated observations are L.H.S. of the rules"

All these comments will be updated in the design.

3-3 Task Knowledge

- "Task: bean" should be changed to "task: melon"

The task will be updated in the design.

4. Design Report Versus Implementation Report

4-1- Domain Knowledge

DOMAIN ONTOLOGY

- The following properties are defined in the implementation report different from the design report.

Desgin report	Implementation report
Spots appearance	Spots_appearance

Spots color	Spots_color
Spots appearance	Spots_appearance
Spots position	Spots_position
Color direction	Color_direction
Spots color	Spots_color
Tunnel color	Tunnel_color
Color position	Color_position
Appearance status	Appearance_status

The under score (_) is not necessary in the design.

- The possible values of the following property is defined in the design report but is not defined in the implementation report:

Concepts	Properties	Page No.
Larva	Appearance	3

The concept larva has no property called " appearance" in the design but in the design generated from the implementation code this concept inherit the "appearance" from its parent "soil".

- The following properties are defined as single-valued attribute in design report but are defined as Mulivalued-attribute in the implementation report:

Concepts	***Properties***	***Page No.***
Larva	Appearance	3
Root	Appearance	3
Root	Color	3
Plant	Appearance	5
Leaves	spots_appearance	6
Leaves	spots_position	7
Leaves	color_direction	7
Leaves	spots_color	7
Leaves	tunnel_color	8
Leaves	color_position	8
Leaves	Color	9
Soil	Appearance	9
Fruits	Appearance	10

The implementation is true and will be updated in the design.

- The possible values of the following properties are defined in the implementation report but they are not found in the design report. Also there are printing errors for some of them:

Concepts	***Properties***	***Page No.***

Root	age		3
Plant	age		5
Stem	age		5
Leaves	age	8	
Fruits	age	10	

The range of the age is not necessary since it is derived.

- The possible value of the following property is defined in the implementation report different from that in the design report (inhereted from parents):

Concepts	Properties	Page No.
Root	appearance	3

The tool inherits the possible values of the property of the supper concept and appends it to the possible values of the concept itself. But this appear in the implementation report only and the source code is true.

- The source of value are defined in the design report, but are not defined mostly for properties in the implementation report. This following is a list of the only defined source of value properties in the implementation:

Concepts	Properties	Page No.
Plant	Age	5
Stem	Color_status	6
Leaves	Appearance_status	7
Fruits	Appearance_status	9

This problem is due to the limitation of the tool when generating the design from the source code, but the source code itself is true.

- The tool should differentiate between type and cardinality.

This comment will be taken into consideration in the next version.

Domain Model

- Calculate age is defind in the design report as inference step, but it is defined in the implementation report as relation. Also, the rule (f1) is unlogic.

This is implementation wise.

- The commas in the rules are in the incorrect position also the printing of Arabic is incorrect (not readable).

This is the Arabic problem.

- In the implementation design the rule r10 contains the value of leaves.appearance_status==”غـير طبـيعى” different from design report which contains leaves.appearance_status==”طبيعى”.

The design is true and has been updated in the implementation.

- The “>” mark are missed from the conditions in r6, r13, r28.

This is a problem in the tool when generating the design from the code, but the source code itself is true.

- If it is possible the rules printed in the same order of the rules number.

This comment will be taken into consideration in the next version.

4-2- Inference Knowledge

- The inference step calculate does not contain static role in the design, but it contains CalculateAge in the implementation.

This is implementation wise.

- The inference step is defined as predict in the design report, but it is defined as suspect in the implementation report.

The implementation uses the relation name instead of the inference step name.

- The static role in the inference step predict is defined as suspect in the design report, but it is defined as suspected in the implementation report.

The static role in the design is “predication model” but the relation name is called ”suspect”.

- The dynamic input role of predict inference step is defined as complaints in the design report, but it is defined by list of properties in the implementation.

This is implementation wise.

- The inference step is defined as differentiate in the design report, but it is defined as confirm in the implementation report.

It is the output of the tool and “confirm” is the relation name.

- The dynamic input role is defined as suspected disorders, observations, plant age in the design report, but it defined as disorders.suspected, list of disorders properties that define observation in the implementation.

The design and the implementation are the same.

- The inference step generate observations is defined in the design report, but is not defined in the implementation report.

The tool uses built in method.

4-3- Task Knowledge

- There is no task layer in the implementation layer.

4-4- User Interface

- The interface in the design report is different from the interface in the implementation report as follows:

The plantation date

The implementation report has a separate screen for entering date with each case but the desgin report has not.

The first screen

- The interface in the design report has the title :

"شاشة ادخال الأعراض الأولية و الآفات المشكوك فى وجودها"

but in the implementation report it has not.

- The interface in the design report has:

"قائمة افات الكانتالوب", "قائمة افات الكانتالوب المشكوك فيها".

But in the implementation report it has:

"الافات المتوقعة".

- The interface in the design report has lists name as:

"المفهوم"، "القيمة"

but in the implementation report it has:

"الظاهرة الموجودة", "الشكوى"

- The interface in the design report has button:

"التالى"

but in the implementation report has:

"الأمراض المؤكدة"

- The interface in the implementation report has the buttons:

"حذف","خروج", "جدول العلاج", "بداية تشخيص"

But in the design interface it has not.

The second screen

- The interface in the design report has the title:

"شاشة ادخال الأعراض الإضافية لتأكيد وجود الآفات "

But in the implementation report it has not.

- The interface in the design report has:

"قائمة آفات الكانتالوب المشكوك فيها", "قائمة الآفات المؤكدة".

But in the implementation report it has:
"آفات مؤكدة".

- The interface in the design report has lists name as:
  ''القيمة"، "المفهوم''
  but in the implementation report it has:
  ''الظاهرة الموجودة'', "أعراض تأكيدية"

- The interface in the design report has buttons:
  ''سابق'' ,''التالى''
  but in the implementation report it has not:

- The interface in the implementation report has the buttons:
  "حذف","خروج" ,''جدول العلاج'' ,''الأمراض المؤكدة'' ,''بداية تشخيص''
  but in the design interface it has not.
  The interface of the implementation is acceptable.

5. Implémentation Report Versus Source Code

- There is no source code.

6. Testing the usability of the system

General Test

- The system does not accept selection of the value ''طبيعى'' unless it select the value ''غير طبيعى'' first.

Solved.

- The system often prints the list ''آفات متوقعة'' as ''آفات مؤكدة''.

Solved.

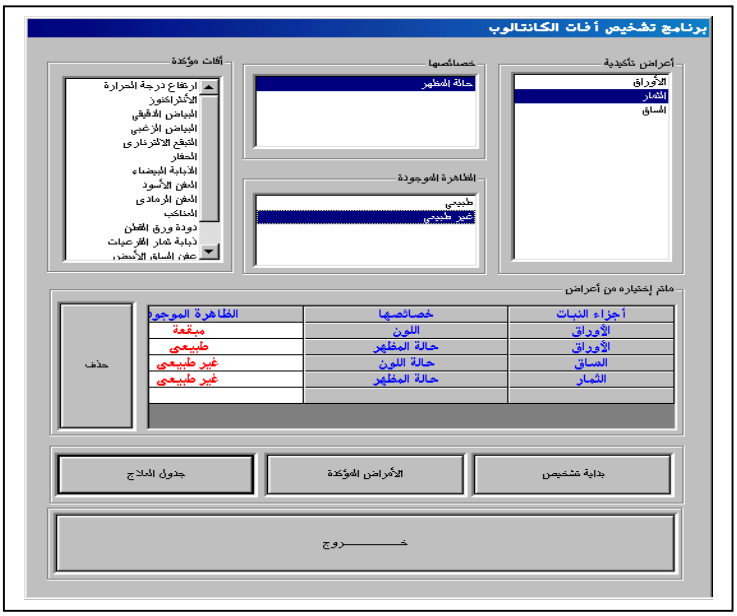
Test cases

- In case 5 the suspected disorder is different in the implementation report from the system. The implementation report has

ارتفاع درجة الحرارة
الأنثراكنوز
البياض الدقيقى
البياض الزغبى
التبقع الالترنارى

الذبابة البيضاء
العفن الأسود
العفن الرمادى
العناكب
عفن الساق الأبيض
لفحة الساق الصمغية

but the system has



The difference is due to the plantation date is not the same.

7. Conclusions

- The tool should differentiate between type and cardinality.

The system is acceptable after making the necessary corrections.