Présentation des annexes

Annexe A : Description de Help!CPR
Help!CPR est une coquille de système de connaissance de type diagnostic. Nous avons utilisé Help!CPR pour vérifier nos hypothèses concernant l'utilisation d'un système de connaissance pour fins de diagnostic pour aider le mesureur. Nous avons emprunté, pour la construction de notre premier prototype, plusieurs idées contenues dans ce système de connaissance. Dans cette annexe nos décrivons brièvement en quoi consiste ce système de connaissance de type diagnostic.

Annexe B : Description du prototype 1
Cette annexe décrit les exigences que nous avons fournies à un étudiant stagiaire à la maîtrise en informatique (Tim Küssing de l'université de Magdeburg en Allemagne) pour réaliser le premier prototype (diagramme de cas, scénarios des agents, exigences détaillées). Il fournit aussi le Guide de l'utilisateur du prototype 1.

Annexe C : Description de l'environnement de développement du prototype 2
Cette annexe décrit l'environnement de développement du prototype 2. Le logiciel a été développé par deux stagiaires dans le cadre de leur maîtrise en informatique (Julien Vilz et François Gruselin de l'université Notre Dame de la Paix en Belgique et supervisé par le Dr Habra). Nous ne présentons pas les exigences car elles sont les même que ceux du premier prototype. En ce qui concerne la base de connaissance, sa structure est déjà décrite dans le texte principal.

Annexe D : Procédure de vérification de la base de connaissance du prototype 1
Cette annexe est la procédure de vérification de la base de connaissance du prototype 1 qui a été fournie aux experts.

Annexe E : Curriculum des experts pour le prototype 1
Cette annexe comprend sur une page le curriculum des experts qui ont contribués à la vérification de la base de connaissance.

Annexe F : Liste des associations internationales: mesure fonctionnelle
L'annexe F fournit la liste des associations internationales pour la mesure fonctionnelle. Cette liste est probablement incomplète, mais elle montre l'intérêt que porte la communauté informatique internationale à la mesure fonctionnelle.

Annexe G : Exemples de règles "locales"
Dans notre recherche il est souvent questions de règles locales ou règles industrielles. L'annexe G fournit un exemple de ces règles locales. Nous remercions ici particulièrement M. Denis St-Pierre du CIM (Centre d'intérêts sur les métriques) pour avoir fournit gracieusement ces règles à l'automne 2001. Nous n'avons pas modifié la liste, ni le vocabulaire utilisé même si parfois non conforme avec le vocabulaire de COSMIC-FFP version 2.2 et notre thèse. Nous avons laissé les règles locales en anglais puisque c'est la langue d'échange entre les experts de la mesure fonctionnelle.

Annexe H : Études de cas
Nous avons utilisé 4 études de cas pour réaliser la base de connaissance du prototype 2. Pour trois de ces études de cas nous fournissons les références URL soit Data Warehouse, Rice Cooker et Valve Control. Pour la dernière (Report Generator), nous fournissons le texte de l'étude de cas.

Annexe I : Formules du prototype 1
Dans le prototype 1, codé en Visual Basic de Microsoft (version 6.0), on retrouve un ensemble de formules qui sont résumées en pseudo code.

Annexe J : Analyses statistiques
Résultats des analyses de variance et de corrélation (SPSS version 8.0)

Annexe K : Résultats des bonnes réponses
Le résultat détaillé des bonnes réponses de chaque mesureur débutant.

Annexe L : Exemples de mauvaises réponses
Exemples de mauvaises réponses de quelques mesureurs débutants (5)

Annexe M : Spécifications présentées aux mesureurs débutants
Cette annexe présente un exemple de documentation fournie aux mesureurs débutants. Il s'agit des deux premières étapes de la première spécification. Cette documentation contient des termes anglais que nous avons conservés tels quels. Nous avons aussi noté de nombreuses fautes de français que nous n'avons pas corrigées.

**Annexe A: description de Help!CPR**

A.1 Description fonctionnelle de Help!CPR (utilisateur)

Help!CPR a un menu permettant d'ouvrir et de sauvegarder plusieurs bases de données en format « Microsoft Access ». Help!CPR organise l'information sur les cas en trois objets distincts: les problèmes, les questions et les actions. Un quatrième objet pourrait être le « query » ou les mots clefs. Les cas sont créés en interconnectant ces objets ensembles. Il n'est pas nécessaire d'avoir l'objet « action » pour la résolution de cas, par contre les autres « objets » sont essentiels.

Il est possible d'assigner (via l'interface de l'expert[1]) une information au niveau des « problèmes » (objet « problems ») ou des actions (objet « actions »), mais pas au niveau des questions (objet « questions »). Cette assignation est l'équivalent d'une référence hypertexte.

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[1] Nous ne présentons pas les interfaces de l'expert de Help!CPR, ce qui demanderait une trop longue explication non nécessaire pour les fins de ce document.
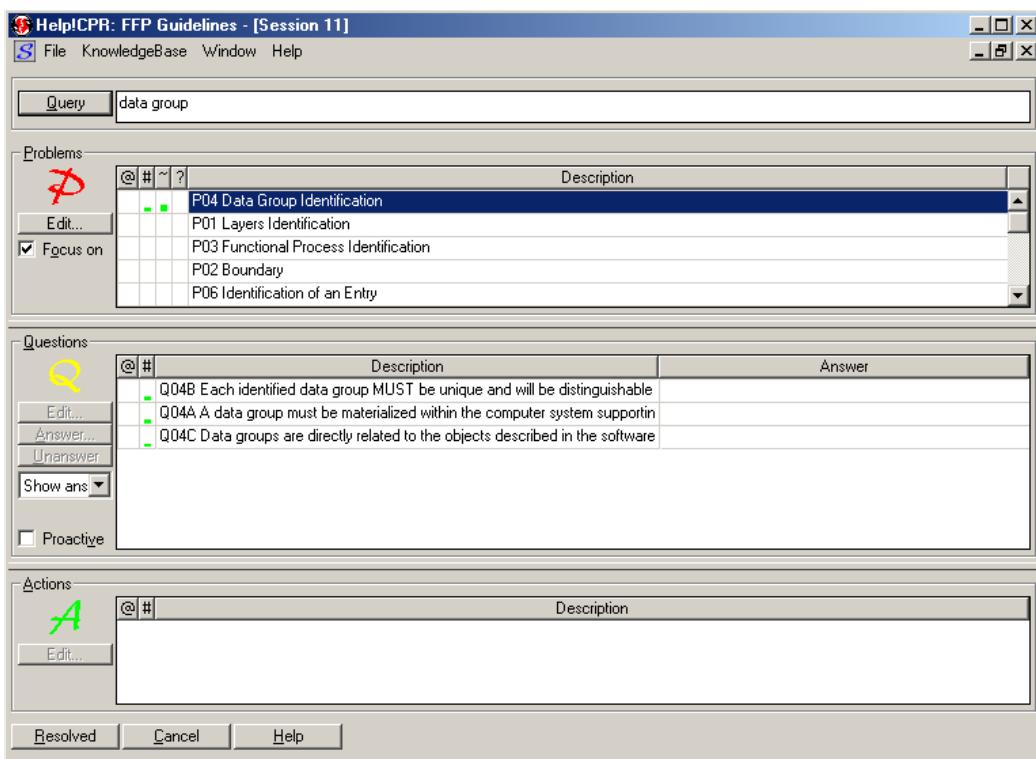
Table 1 Interface utilisateur de Help!CPR

Il est possible de choisir un problème particulier en utilisant la fonction ou l'objet « Query » (mot clef). Help!CPR met en relation le problème identifié et les cas se trouvant dans la base de cas. Il suggère alors un ou des problèmes à solutionner. Par exemple, en entrant le terme « data group » dans l'objet « Query » on retrouve dans l'objet « problems », le problème relatif au « data group ».

Automatiquement, dans l'objet « questions », les questions relatives à ce problème apparaissent. Le novice doit alors entrer une réponse. Ces réponses donnent une solution possible au problème. La couleur verte à gauche indique une réponse positive, alors que la couleur rouge indique une réponse négative. Il est aussi possible de suggérer une action selon la nature des réponses aux questions. Ici l'action pourrait être d'aller vers d'autres « mots clefs » pour compléter la connaissance. À noter aussi le numéro de session. Chaque session est numérotée et suivie.

A.2 Description fonctionnelle de Help!CPR (expert)

Ce logiciel a inspiré notre démarche cognitive au départ.

A 2.1 Les problèmes

La Figure 15 montre l'interface de l'expert qui permet de poser des questions et aussi l'interface des questions. Le problème peut apparaître sous forme d'énoncés ou de questions. À chaque problème est associé un ensemble de questions (voir questions plus bas). Il est aussi possible d'introduire des commentaires à chaque problème en éditant un problème particulier (voir EDIT).
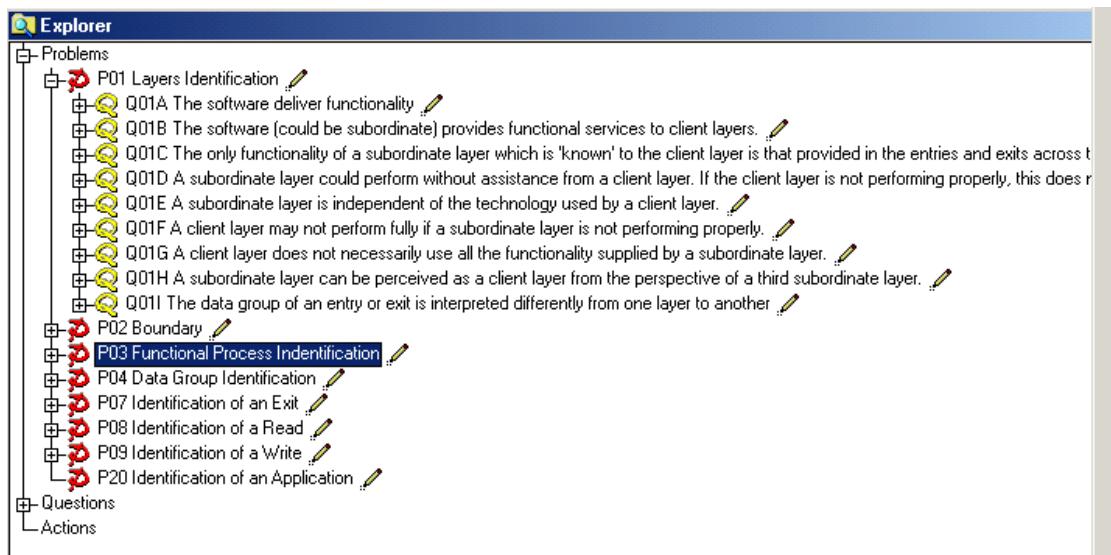
Table 2 Interface expert

La Figure 16 montre les questions liées au problème d'identification du processus unique.

Il est aussi possible d'entrer des commentaires.

A.2.2 Les questions

La Figure 17 montre la section « questions » d'une session. À une réponse à une question est associé un pourcentage. Ici, à la question : « Do we have batch and on line function? », la réponse « Yes » est associée à un pourcentage d'influence de la réponse à la résolution du problème selon l'expert. Ces influences sont ensuite additionnées. Il est aussi possible d'introduire des commentaires à chaque question en éditant une question particulière (voir EDIT).

Table 3 Questions

La Figure 18 montre comment est traitée une question par l'expert.
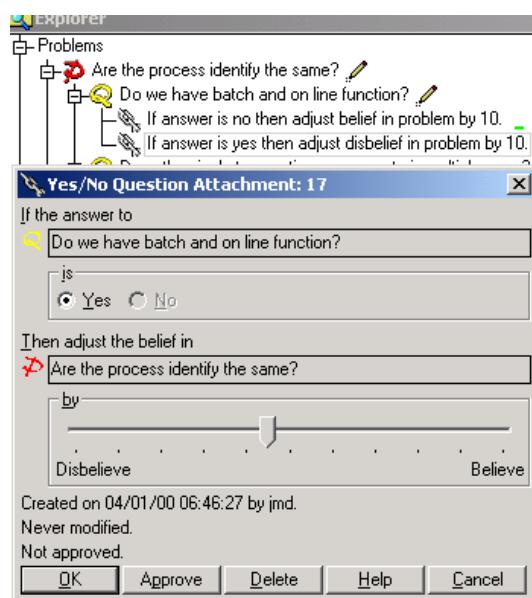
Table 4 Traitement d'une question par l'expert

Il est possible à l'expert de noter un pourcentage sur la valeur de la réponse, ici appelée croyance positive ou négative. Help!CPR permet des réponses aux questions avec des choix multiples et avec des nombres. Ces options ne sont pas montrées à l'écran. Dans le contexte de COSMIC-FFP ces options ne sont pas utilisées, sur la base des expériences que nous avons réalisées à date. Nous ne rejetons pas cependant définitivement ces options, mais il nous faudra des expérimentations plus poussées pour les valider.

A.2.3 Les actions

La section action est reliée aux problèmes. Dans le modèle de diagnostic, nous utiliserons l'action pour inciter un novice à regarder d'autres problèmes apparaissant normalement avec le type de problème posé. Les exemples d'action de Help!CPR ne sont pas de cette nature : lors du diagnostic d'une imprimante, on suggérera comme action de vérifier la connexion par exemple. Notre intention est de pouvoir associer d'autres problèmes au problème du novice (les mots clefs permettent les réponses aux questions à d'autres problèmes). Ce serait une forme d'apprentissage guidé en tenant compte du contexte des réponses aux questions.

A.2.4 Les mots

Il est aussi possible, pour un utilisateur, de voir la liste des mots clés qu'il peut utiliser pour résoudre un problème. Il y a trois catégories de mots (Figure 19) : les mots clefs, les mots qu'il faut ignorer et les mots non classifiés. La classification des mots devrait se faire par l'expert dans le mode sélection. Il suffit de sélectionner un mot dans la liste et d'indiquer s'il s'agit :

- d'un mot clef ou
- d'un mot à ignorer

Table 5 Les mots

Les mots peuvent apparaître par ordre alphabétique ou selon leur nombre d'occurrences. Il est aussi possible de choisir s'il faut montrer une (ou des) catégorie(s) de mots.

La somme des mots indique combien de fois un mot apparaît au moins une fois dans la description d'un problème ou dans la documentation. La moyenne fait référence au nombre moyen de fois qu'un mot apparaît au moins une fois dans la chaîne de caractères de la description d'un problème ou dans la documentation. La déviation réfère à la déviation à partir de la moyenne.

La table des mots (Figure 20) est extraite des descriptions des problèmes et de leur documentation. Il est possible de réindexer cette table à tout moment.

Table 6 Les mots (suite)

Annexe B: description du prototype 1

Annexe B, partie 1: Exigences détaillées (English)
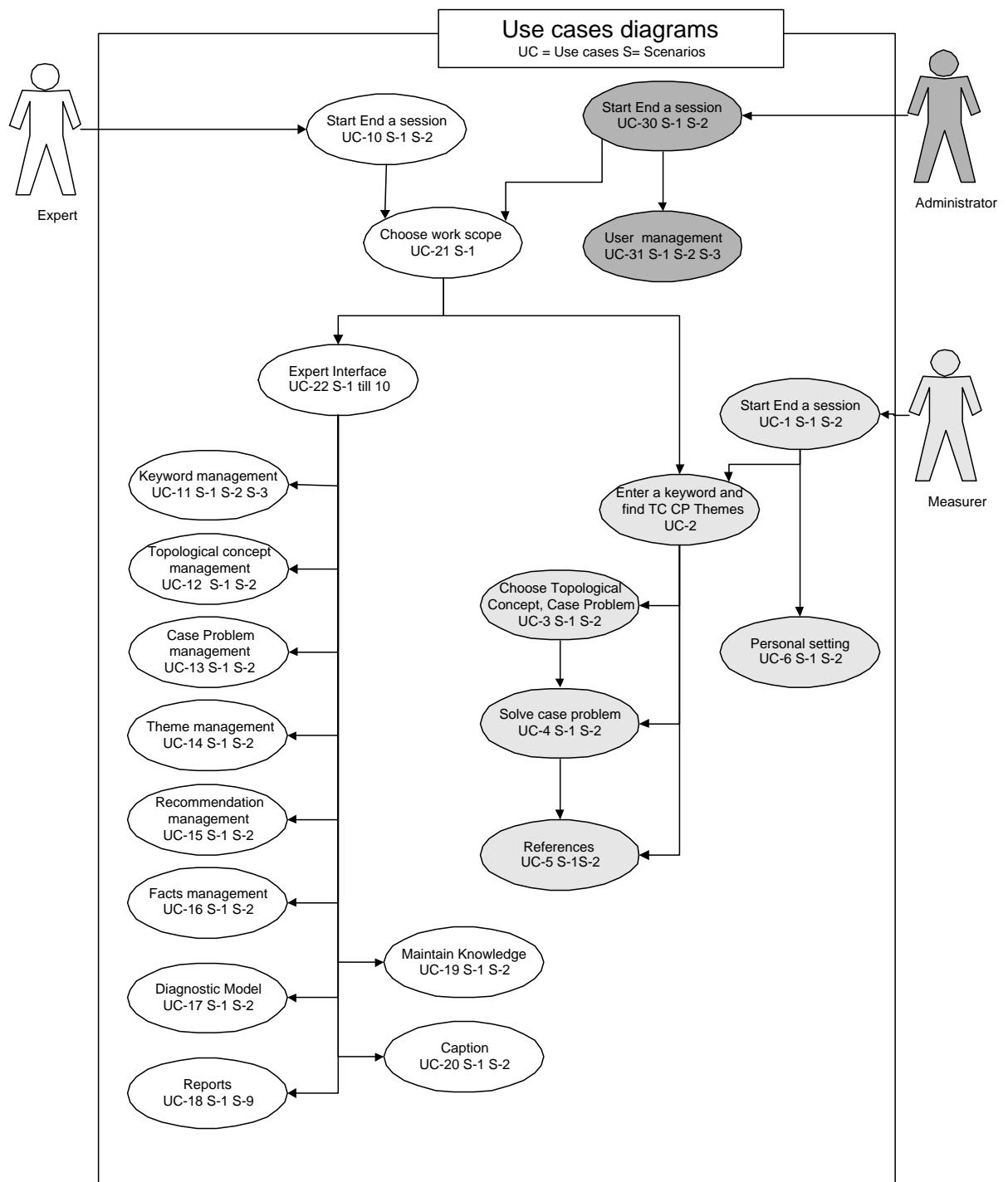
Figure 1 Diagramme de cas

Voici un tableau avec les acteurs, événements et entrée/sortie (E) et (S) du prototype pour le mesureur.

| Acteur	Événement	Entrée/Sortie
Mesureur	Entrer un mot clef	(E)
Mesureur	Rechercher les concepts topologiques et cas problèmes	(E)
Mesureur	Sélectionner les concepts topologiques et cas problèmes désirés	(E)
Mesureur	Sélectionner les faits sur la base des informations disponibles via la documentation	(E)
Mesureur	Entrer une information sur la qualité de la documentation en regard avec un thème particulier (Note: a été enlevé dans le deuxième prototype)	(E)
Mesureur	Recommandation appropriée	(S)
Mesureur	Réponse ou valeur sur la qualité de la documentation	(E)
Mesureur	Demander comment compacter la base de données	(E) et (S)
Mesureur	Demander une explication sur un mot clef, un concept topologique, un cas problème, un thème ou une recommandation spécifique.	(E) et (S))
Mesureur	Demander une description de ce qu'ent une ontologie, un mot clef, un concept topologique, un cas problème, un thème ou une recommandation.	(E) et (S)
Mesureur	Requête sur ses paramètres utilisateur	(S)
Mesureur	Modifier le nom de l'utilisateur, le mot de passe et le langage	(E)

Tableau 9 Scénarios du mesureur

Voici un tableau avec les acteurs, événements et entrée/sortie (E) et (S) du prototype pour l'expert et l'administrateur.

Acteur	Événement	Entrée/Sortie
Expert	Ajouter, modifier et détruire un cas spécifique de connaissance	(E)
Expert	Modifier les boutons, en-têtes, titres et autres des interfaces	(E)
Expert	Demander des rapports tels le suivi du mesureur, la session, ou encore les relations entre les connaissances d'expertise.	(S)
Expert	Montrer une description sommaire d'un noeud dans un arbre lorsque sélectionné	(S)
Expert	Copier, couper et coller des noeuds dans l'arbre	(E)
Expert	Demander les propriétés des cas spécifiques des connaissances	(S)
Expert	Sélectionner l'outil de diagnostique désiré	(E)
Expert	Maintenir des cas spécifiques de connaissance dans différents langages (Note: pas dans le deuxième prototype)	(E)
Expert	Détruire le rapport de suivi du mesureur ou la session	(E)

Acteur	Événement	Entrée/Sortie
Expert	Aller vers les fonctionnalités du mesureur et résoudre un problème	(E)
Admin	Ajouter, modifier ou détruire un utilisateur	(E)
Admin	Utiliser les fonctionnalités de l'expert	(E) et (S)
Admin	Utiliser les fonctionnalités du mesureur	(E) et (S)

Tableau 1 Scénarios de l'expert et de l'administrateur

Use case 1: Start/End a session
Scenario 1: Start a session
Description: Enter username, password and click 'OK' button. Primary actor: Measurer Secondary actor: None Pre conditions User registered to the system with the status "MEASURER" Exception: If user does not exist or expired, or password not valid, display error massage. Post condition: see Figure 42 Classes implied: user, session, error message Interface: see Figure 40
Calculations: No

Use case 1: Start/End a session
Scenario 2: End a session
Description: When the Measurer clicks the 'Exit' button or the close button of a form, the application will be terminated. Primary actor: Measurer Secondary actor: None Pre conditions: UC-1, S-1 Exception: None Post condition: Measurer Follow Up if Themes have been answered; Program ends. Classes implied: Session, Keyword, Topology, Problem, Theme, Facts, Recommendation,   Subsession, User Interface: see Figure 42
Calculations: No

Use case 2: Enter a keyword and find TCs2, CPs3, Themes and R4
Scenario 1: Enter a keyword
Description: Measurer enters a keyword into a text box and starts search Primary actor: Measurer Secondary actor: None Pre conditions: Existence of KW AND relationships between KW5 and TCs, TC and CPs, CP and Themes Exception: If keyword does not exist and error message will be displayed Post condition: All related items to the chosen keyword will be displayed in Figure 42 Classes implied: keyword, topology, case problem, theme, recommendation, measurer follow-up, session, answer, results, parameters, adjustment Interface: see Figure 42
Calculations: No

2 Topological Concepts
3 Case problems
4 Recommendations
5 Keyword

Use case 3: Choose Topological Concepts, case problems Scenario 1: Choose Topological Concepts
Description: From the list of displayed TC(s) related to the keyword, the measurer can make a choice which he wants to keep. Primary actor: Measurer Secondary actor: None Pre conditions: Use case 2, Scenario 1. Exception: If there is no TC displayed, the user does not have the ability to choose. Post condition: Only the CP and Themes related to the chosen TC(s) will be displayed. Classes implied: topology, case problem, Theme, recommendation Interface: see Figure 42
Calculations: No

Use case 3: Choose Topological Concepts, case problems Scenario 2: Choose case problem
Description: From the list of displayed CP(s) related to the keyword, the measurer can make a choice which he wants to keep. Primary actor: Measurer Secondary actor: None Pre conditions: Use case 2, Scenario 1. Exception: If there is no CP displayed, the user does not have the ability to choose. Post condition: Only the Themes related to the chosen CP(s) will be displayed. Classes implied: : topology, case problem, Theme, Recommendation Interface: see Figure 42
Calculations: No

Use case 4: Solve Case Problem Scenario 1: Select facts
Description: The user chooses one fact from the selection of possible facts belonging to each Theme Primary actor: Measurer Secondary actor: None Pre conditions: UC 2, S-1 OR UC 3, S-1. Exception: No Post condition: The choosen fact will be displayed. Classes implied: Theme, fact Interface: see Figure 46
Calculations: Yes

Use case 4: Solve Case Problem Scenario 2: Enter quality of documentation
Description: Provide system with the quality of your documentation to select a fact for this Theme. Primary actor: Measurer

Secondary actor: None
Pre conditions: : UC 2, S-1 OR UC 3, S-1 OR UC 4, S-1
Exception: Default value is set to 100%.
Post condition: The entered percentage will be displayed
Classes implied: Adjustment, Fact, Measurer follow-Up
Interface: see Figure 47

Calculations: Yes

Use case 5: References
Scenario 1: Ask for reference

Description: the user asks to see a reference (rich text file format) for a specific KW, TC, CP, Theme, Recommendation
Primary actor: Measurer
Secondary actor: None
Pre conditions: Existence of a rtf file AND UC 2
Exception: If no file exist with that name, error message
Post condition: Loaded rich text file
Classes implied: Reference, Keyword, Topology, Problem, Theme, Recommendation, Fact
Interface: see Figure 42 and 44

Calculations: No

Use case 5: References
Scenario 2: Ask for definitions

Description: the user has the possibility to get a definition of what is a KW, TC, CP, Theme, Recommendation and Ontology
Primary actor: Measurer
Secondary actor: None
Pre conditions: Existence of a rtf file AND UC 1, S-1
Exception: If no file exist with that name, error message
Post condition: Loaded rich text file
Classes implied: None
Interface: see Figure 42 and 44

Calculations: No

Use case 6: Personal setting
Scenario 1: Query personal settings

Description: User wants to see his personal settings.
Primary actor: Measurer, Expert, Administrator
Secondary actor: None
Pre conditions: UC 1, S-1
Exception: None
Post condition: The personal setting are displayed in Figure 45

Classes implied: user
Interface: see Figure 45
Calculations: No

Use case 6: Personal setting
Scenario 2: Change personal settings
Description: User is able to change the language of program, his username or password.
Primary actor: Measurer
Secondary actor: None
Pre conditions: Use case 6, scenario 1.
Exception: Error message if user didn't confirmed his new password or if the confirmed password differs from the new password.
Post condition: Changes are updated in the database.
Classes implied: User
Interface: see Figure 45
Calculations: No

EXPERT

Use case 10: Start/End a session
Scenario 1: Start a session
Description: Enter username, password and click 'OK' button.
Primary actor: Expert
Secondary actor: None
Pre conditions: User registered to the system with the status "EXPERT"
Exception: If password Is incorrect, user does not exist or his time is expired, display error massage.
Post condition: Use case 21, session started
Classes implied: Session, User
Interface: see Figure 40
Calculations: No

Use case 10: Start/End a session
Scenario 2: End a session
Description: Exit the program
Primary actor: Expert
Secondary actor: None
Pre conditions: Use case 10, scenario 1.
Exception: No
Post condition: Program determined
Classes implied: Session
Interface: see Figure 49 or Figure 42

Calculations: No

Use case 11: Keyword management
Scenario 1: Add a keyword
Description: Add a keyword to the system by entering its name, description and rtf file Primary actor: Expert Secondary actor: None Pre conditions: Use case 22, Scenario 1 Exception: Keyword and keyword description are required. If one or both are not provided display error message. Post condition: Ready to enter another keyword (use case 11, scenario 1) Classes implied: Keyword, Reference Interface: see Figure 53
Calculations: No

Use case 11: Keyword management
Scenario 2: Modify keyword
Description: User is able to modify the description of selected keyword as well as to make changes to his related Topological Concepts (name, description, rft file and relationship to the keyword) Primary actor: Expert Secondary actor: None Pre conditions: UC 11, S-1 AND UC 22, S-1 Exception: Name and Description have to be less than 256. Post condition: Ready to modify other keyword Classes implied: Keyword, Topology, Reference Interface: see Figure 54
Calculations: No

Use case 11: Keyword management
Scenario 3: Delete keyword
Description: Delete a keyword by choosing it from a list Primary actor: Expert Secondary actor: None Pre conditions: (UC 11, S-1 OR S-2) AND UC 22, S-1 Exception: None Post condition: Ready to delete other keyword Classes implied: Keyword, Topology, Reference Interface: see Figure 60
Calculations: No

Use case 12: Topological Concept management
Scenario 1: Add a Topological Concept
Description: Add a Topological Concept to a keyword Primary actor: Expert

Secondary actor: None Pre conditions: UC 11, S-1 Exception: None Post condition: UC 12, S-1. Classes implied: Keyword, Topology, Reference Interface: see Figure 58
Calculations: No

Use case 12: Topological Concept management Scenario 2: Modify a Topological Concept
Description: Modify the name of a TC, its description, rtf file and relationship to a keyword Primary actor: Expert Secondary actor: None Pre conditions: Existence of relationship between TC and at least one Keyword Exception: Name and Description have to be less than 256 characters and the relationship percentage has to be between 0% and 100% Post condition: UC12, Scenario 2 Classes implied: Keyword, Topology, Reference Interface: see Figure 54
Calculations: No

Use case 13: Case Problem management Scenario 1: Add a case problem
Description: Add a Case Problem to a Topological Concept Primary actor: Expert Secondary actor: None Pre conditions: UC 12, S-1 AND UC 22, S-3 Exception: Name of the CP, its description and relationship to the TC are required. If not provided show error message. Post condition: Ready to add another Case Problem or return to use case 22, scenario 3 Classes implied: Topology, Case Problem, Reference Interface: see Figure 58
Calculations: No

Use case 13: Case Problem management Scenario 2: Modify a case problem
Description: Modify the name of the case problem, its description, rtf file and the relationship to the TC Primary actor: Expert Secondary actor: None Pre conditions: Use case 22, scenario 3 AND UC 13, S-1 Exception: Name and Description have to be less than 256 characters and the relationship percentage has to be between 0% and 100% Post condition: Ready to modify another Case Problem related to the same TC

Classes implied: Topology, Case Problem, Reference
Interface: see Figure 56
Calculations: No

Use case 14: Theme management
Scenario 1: Add a Theme
Description: Add a Theme to a case problem
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 13, S-1 AND UC 22, S-3
Exception: Required information in the Theme name, its description and the relationship to the case problem. If not entered an error message will appear.
Post condition: UC 14, S-1
Classes implied: Case Problem, Theme, Reference
Interface: see Figure 58
Calculations: No

Use case 14: Theme management
Scenario 2: Modify a Theme
Description: Modify the name of a Theme, the description, rtf file and the relationship to its case problem
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 14, S-1 AND UC 22, S-3
Exception: Name and Description have to be less than 256 characters and the relationship percentage has to be between 0% and 100%
Post condition: UC 14, S-2
Classes implied: Case Problem, Theme, Reference
Interface: see Figure 59
Calculations: No

Use case 15: Recommendation management
Scenario 1: Add recommendation
Description: Add a recommendation to a case problem
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 13, S-1 AND UC 22, S-3
Exception: Required information in the recommendation name, its description and the relationship to the case problem. If not entered an error message will appear.
Post condition: Add another recommendation or Use case 22, scenario 3
Classes implied: Case Problem, Recommendation, Reference
Interface: see Figure 58
Calculations: No

Use case 15: Recommendation management

Scenario 2: Modify recommendation
Description: Modify the name of recommendations, its description, rtf file and the relationship to its case problem. Primary actor: Expert Secondary actor: None Pre conditions: UC 15, S-1 AND UC 22, S-3 Exception: Name and Description have to be less than 256 characters and the relationship percentage has to be between -100% and +100% Post condition: UC15, S-2 Classes implied: Case Problem, Recommendation, Reference Interface: see Figure 59
Calculations: No

Use case 16: Fact management Scenario 1: Add fact
Description: Add a recommendation to a Theme Primary actor: Expert Secondary actor: None Pre conditions: UC 14, S-1, UC 22, S-3 Exception: Required information is the fact name, its description and the relationship to the Theme. If not entered an error message will appear. Post condition: UC16, S-1 Classes implied: Theme, Fact, Reference Interface: see Figure 58
Calculations: No

Use case 16: Fact management Scenario 2: Modify fact
Description: Modify the name of the fact, its description, rtf file and the relationship to its Theme. Primary actor: Expert Secondary actor: None Pre conditions: UC 16, S-1 AND UC 22, S-3 Exception: Name and Description have to be less than 256 characters and the relationship percentage has to be between -100% and +100% Post condition: UC 16, S-2 Classes implied: Theme, Fact, Reference Interface: see Figure 56
Calculations: No

Use case 17: Diagnostic model Scenario 1: Show models
Description: Display three different diagnostic models Primary actor: Expert Secondary actor: None

Pre conditions: User case 22, scenario 1
Exception: Default is diagnostic model 1.
Post condition: Use case 17, scenario 2
Classes implied: Parameters
Interface: see Figure 51

Calculations: No

Use case 17: Diagnostic model
Scenario 2: Select a diagnostic model

Description: Select one of the three diagnostic models and hit button 'OK'
Primary actor: Expert
Secondary actor: None
Pre conditions: Use case 17, scenario 1
Exception: No
Post condition: Use case 22, scenario 1
Classes implied: Parameters
Interface: see Figure 51

Calculations: No

Use case 18: Reports
Scenario 1: Show measurer follow up

Description: Populate follow up data in an Excel sheet
Primary actor: Expert
Secondary actor: None
Pre conditions: Use case 22, scenario 1 AND open Excel workbook
Exception: No
Post condition: Use case 22, scenario 1
Classes implied: Answers, Results
Interface: Excel workbook

Calculations: No

Use case 18: Reports
Scenario 2: Delete Measurer follow up information

Description: Delete the information to produce the Excel follow up file in the databae.
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: none
Post condition: UC 18
Classes implied: Measurer Follow Up
Interface: see Figure 62

Calculations: No

Use case 18: Reports
Scenario 3: Show session report

Description: Populate session parameters in an Excel sheet
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 22, S-1 AND open Excel workbook
Classes implied: Session
Interface: Excel workbook

Calculations: No

Use case 18: Reports
Scenario 4: Delete session report

Description: Deletes the content of the database which is necessary to build th Session-report
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 18
Classes implied: Session
Interface: see Figure 62

Calculations: No

Use case 18: Reports
Scenario 5: Show relationship between KWs and TCs

Description: Populate how Keywords are related with Topological Concepts
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 22, S-1
Classes implied: Session
Interface: see Figure 52

Calculations: No

Use case 18: Reports
Scenario 6: : Show relationship between TCs and CPs

Description: Populate how Topological Concepts are related to Case Problems
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 22, S-1
Classes implied: Session
Interface: see Figure 52

Calculations: No

Use case 18: Reports
Scenario 7: : Show relationship between CPs and Themes

Description: Populate how Case Problems are related to Themes
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 22, S-1
Classes implied: Session
Interface: see Figure 52

Calculations: No

Use case 18: Reports
Scenario 8: Show relationship between CPs and Recommendations

Description: Populate how Case Problems are related to Recommendations
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 22, S-1
Classes implied: Session
Interface: see Figure 52

Calculations: No

Use case 18: Reports
Scenario 9: Show relationship between Themes and Facts

Description: Populate how Themes are related to Facts
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 22, S-1
Classes implied: Session
Interface: see Figure 52

Calculations: No

Use case 19: Maintain Knowledge
Scenario 1: Query case specific data in all languages

Description: The expert can choose from a drop down list what knowledge he wants to maintain, Keywords, TCs, etc.
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1

Exception: No
Post condition: UC 22, S-1
Classes implied: Keyword, Topology, Case Problem, Theme, Recommendation, Fact
Interface: see Figure 61

Calculations: No

Use case 19: Maintain Knowledge
Scenario 2: Change case specific data in all languages

Description: The expert can the name and description in the different languages for all
Keywords, TCs …
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 19, S-1
Exception: No
Post condition: UC 19, S-2
Classes implied: Keyword, Topology, Case Problem, Theme, Recommendation, Fact
Interface: see Figure 61

Calculations: No

Use case 20: Caption
Scenario 1: Query for captions of user interfaces

Description: Show captions of the complete program used for button, labels, form titles
etc. in all languages
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 22, S-1
Exception: No
Post condition: UC 20, S-2
Classes implied: Language
Interface: see Figure 50

Calculations: No

Use case 20: Caption
Scenario 2: Adapt captions of user interfaces

Description: Change captions of buttons, labels, form titles etc. (all languages)
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 20, S-1
Exception: None
Post condition: UC 22, S-1
Classes implied: Language
Interface: see Figure 50

Calculations: No

Use case 21: Choose work scope

Scenario 1: Choose work scope
Description: Measurer selects if he wants to solve a problem or maintain the system
Primary actor: Expert
Secondary actor: None
Pre conditions: UC 10, S-1
Exception: No
Post condition: Use case 2 (to solve a problem) or Use case 22 (maintain the system)
Classes implied: None
Interface: see Figure 48
Calculations: No

Use case 22: Expert Interface
Scenario 1: Query for structure of case specific knowledge
Description: Display the hierarchical structure of case specific knowledge in tree view
Primary actor: Expert
Secondary actor: None
Pre conditions: Existence of expert knowledge
Exception: none
Post condition: Use case 22
Classes implied: Keyword, Topology, Case Problem, Theme, Fact, Recommendation
Interface: see Figure 49
Calculations: No

Use case 22: Expert Interface
Scenario 2: Description
Description: Description of the highlighted item in the tree view will appear in the text box.
Primary actor: Expert
Secondary actor: None
Pre conditions: Existence of expert knowledge
Exception: none
Post condition: Use case 22
Classes implied: Topology, Case Problem, Theme, Fact, Recommendation
Interface: see Figure 49
Calculations: No

Use case 22: Expert Interface
Scenario 3: Properties
Description: When right-clicking on an item in the tree view a menu appear. Hitting "properties" will lead to a screen where modifications to related items can be made.
Primary actor: Expert
Secondary actor: None
Pre conditions: Existence of expertise knowledge
Exception: none
Post condition: Use case 22

Classes implied: Topology, Case Problem, Theme, Fact, Recommendation Interface: Figure 56 OR Figure 57
Calculations: No

Use case 22: Expert Interface Scenario 4: Cut
Description: Highlighted item can be cut into the temporary storage by employing the menu "Edit-cut" or using the shortcut "Strg+X" Primary actor: Expert Secondary actor: None Pre conditions: Existence of expert knowledge Exception: Post condition: Classes implied: Interface: see Figure 49
Calculations: No

Use case 22: Expert Interface Scenario 5: Paste
Description: Items in the temporary storage can be entered, employing the menu "Edit-paste" or using the shortcut "Strg+V" Primary actor: Expert Secondary actor: None Pre conditions: UC 22, S4 OR S-8 Exception: none Post condition: Item has been pasted to the new location Classes implied: Topology, Case Problem, Theme, Fact, Recommendation Interface: see Figure 49
Calculations: No

Use case 22: Expert Interface Scenario 6: Delete
Description: Highlighted item can be deleted by employing the menu "Edit-delete" or hitting the button "del" Primary actor: Expert Secondary actor: None Pre conditions: Existence of expert knowledge Exception: Post condition: Node is removed from the tree view and deleted in the database Classes implied: Topology, Case Problem, Theme, Fact, Recommendation Interface: see Figure 49
Calculations: No

Use case 22: Expert Interface Scenario 7: Drag&Drop

Description: Nodes in the tree view can be drag&dropped like in the Windows Explorer.
Primary actor: Expert
Secondary actor: None
Pre conditions: Existence of expert knowledge
Exception: none
Post condition: The dragged item has been copied to the new location
Classes implied: Topology, Case Problem, Theme, Fact, Recommendation
Interface: see Figure 49

Calculations: No

Use case 22: Expert Interface
Scenario 8: Copy

Description: Highlighted item can be copied into the temporary storage by employing the menu "Edit-copy" or using the shortcut "Strg+C"
Primary actor: Expert
Secondary actor: None
Pre conditions: Existence of expert knowledge
Exception:
Post condition:
Classes implied:
Interface: see Figure 49

Calculations: No

ADMINISTRATOR

Use case 30: Start/End a session
Scenario 1: Start a session

Description: Enter username, password and click 'OK' button.
Primary actor: Administrator
Secondary actor: None
Pre conditions User registered to the system with the status "ADMINISTRATOR"
Exception: If user does not exist or the password is not correct, display error massage.
Post condition: see Figure 40
Classes implied: user, session, error message
Interface: see Figure 40

Calculations: No

Use case 30: Start/End a session
Scenario 2: End a session

Description: Exit the program
Primary actor: Administrator
Secondary actor: None
Pre conditions: UC 30, S-1

Exception: None
Post condition: Program terminated
Classes implied: Session
Interface: see Figure 42 OR Figure 49

Calculations: No

Use case 31: User management
Scenario 1: Add a user

Description: Add a new user to the system
Primary actor: Administrator
Secondary actor: None
Pre conditions: UC 30,S-1
Exception: User status has to be either "Measurer", "Expert" or "Administrator". Valid languages are English, French, German and Italian. Valid diagnostic-models values are 0, 1 or 2
Post condition: UC 31
Classes implied: User
Interface: see Figure 63

Calculations: No

Use case 31 User management
Scenario 2: Modify user

Description: Modify user parameter
Primary actor: Administrator
Secondary actor: None
Pre conditions: UC 30,S-1
Exception: User status has to be either "Measurer", "Expert" or "Administrator". Valid languages are English, French, German and Italian. Valid diagnostic-models values are 0, 1 or 2
Post condition: UC 31
Classes implied: User
Interface: see Figure 63

Calculations: No

Use case 31: User management
Scenario 1: Delete a user

Description: Delete a user
Primary actor: Administrator
Secondary actor: None
Pre conditions: UC 30,S-1
Exception:
Post condition: UC 31
Classes implied: User
Interface: see Figure 63

Calculations: No

Functional and Data Requirements

Functional Requirements.

Measurer

Requirement #: 1
Requirement Type: M_login Use case #: 1 **Description**: Login to the system and open a new session by entering the *username* and *password* Rationale: Only customers who paid for the product should have access Source: Jean-Marc Desharnais Fit Criterion: User who is not enlisted in the user-database or have an expired license may not have access to the program Customer Satisfaction: 5 Customer Dissatisfaction: 5 Dependencies:

Requirement #: 2
Requirement Type: M_LogIn Use case #: 4 **Description**: Automatically open a new *subsession* everytime the measurer searches for a *keyword* **Rationale:** For statistic reasons **Source:** Jean-Marc Desharnais , Tim Kuessing Fit Criterion: Cross check with session report, if sessions (and subsession) have been registered correct. Customer Satisfaction: 5 Customer Dissatisfaction: 5 Dependencies:

Requirement #: 3

Requirement Type: M_KW   Use case #: 2
Description: The measurer can browse and select a keyword from a list
Rationale: Makes it easier for the measurer to find a matching keyword to his needs
Source: Jean-Marc Desharnais
Fit Criterion: Pop-up menu with keywords
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies: The keywords will be supplied from a database

Requirement #: 4

Requirement Type: M_KW   Use case #: 5
Description: Displaying an rtf-reference for each keyword in the list on right-click
(keyword has to be highlighted)
Rationale: Additional information for the measurer.
Source: Jean-Marc Desharnais, Tim Küssing
Fit Criterion: Appearance of rtf file belonging to specific keyword
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:

Requirement #: 5

Requirement Type: M_MainWindow

Description: Query for the related Topological Concepts, problems and questions after choosing a keyword
Rationale: To enable the measurer to exclude topics or problems from whom he knowns they are not relevant to solve his problem.
Source: Jean-Marc Desharnais
Fit Criterion: Display only those topological conepts and case problems (Themes and recommendations) the user selected
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies: The relationships will be supplied by a database

Requirement #: 6

Requirement Type: M_MainWindow   Use case #: 3
Description: Enable the measurer to exclude certain Topological Concepts from problem solving process
Rationale: The measurer should be able to elemiate possible of case problems from whom he knows are not relevant
Source: Jean-Marc Desharnais
Fit Criterion: Delete TCs and re-run query with the selected TCs
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 7

Requirement Type: M_MainWindow   Use case #: 3
Description: Enable the measurer to exclude certain case problems from problem solving process
Rationale: The measurer should be able to eliminate possible case problems from whom he thinks are not relevant
Source: Jean-Marc Desharnais
Fit Criterion: Delete Case Problems and re-run query with the selected Case Problems
Customer Satisfaction: 5

Customer Dissatisfaction: 5
Dependencies:

Requirement #: 8

Requirement Type: M_MainWindow   Use case #: 4
Description: The measurer will be able to select a fact from a variety of possible answers (yes/no or multiple choice) according to a Theme.
Rationale: The mesurer has to use pre-defined facts set up by the expert to perform the calculation
Source: Jean-Marc Desharnais
Fit Criterion: Select a fact belonging to a specific Theme
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies: The answers will be stored in a database

Requirement #: 9

Requirement Type: M_MainWindow   Use case #: 4
Description: Based on the raised Topological Concepts, case problems, Themes and selected facts, the diagnostic system has to automatically calculate one or more recommendations.
Rationale: Main task of a diagnostic tool, supply the user with problem solving strategies
Source: Jean-Marc Desharnais
Fit Criterion: As soon as a Theme has been answered one recommendation will appear.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 10

Requirement Type: M_MainWindow   Use case #: 5
Description: Displaying an explanation for a Topological Concept
Rationale: Tool has to be 'transperen' so the user can increase his own expertise.
Source: Jean-Marc Desharnais
Fit Criterion: Right click on a specific Topological Concept and choose *explanation* from the pop-up window, a rich text file will be displayed.

Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 11

Requirement Type: M_MainWindow   Use case #: 5
Description: Displaying an explanation for a Case Problem
Rationale: Tool has to be 'transperen' so the user can increase his own expertise.
Source: Jean-Marc Desharnais
Fit Criterion: Right click on a specific Case Problem and choose *explanation* from the pop-up window, a rich text file will be displayed.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 12

Requirement Type: M_MainWindow   Use case #: 5
Description: Displaying an explanation for a Theme
Rationale: Tool has to be 'transperen' so the user can increase his own expertise.
Source: Jean-Marc Desharnais
Fit Criterion: Right click on a specific Theme and choose *explanation* from the pop-up window, a rich text file will be displayed.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 13

Requirement Type: M_MainWindow   Use case #: 5
Description: Displaying an explanation for a Recommendation
Rationale: Tool has to be 'transparent' so the user can increase his own expertise.
Source: Jean-Marc Desharnais
Fit Criterion: Right click on a specific Recommendation and choose *explanation* from the pop-up window, a rich text file will be displayed.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 14

Requirement Type: M_MainWindow   Use case #: 5
Description: The user can see an explanation of what is a Topological Concept.
Rationale: Helps the user understand the system better.
Source: Jean-Marc Desharnais
Fit Criterion: User hits a button and the explanation will come up
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:
Conflicts:
Supporting Materials:

Requirement #: 15

Requirement Type: M_MainWindow   Use case #: 5
Description: The user can see an explanation of what the Case Problem is.
Rationale: Helps the user understand the system better.
Source: Jean-Marc Desharnais
Fit Criterion: User hits a button and the explanation will come up
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:

Requirement #: 16

Requirement Type: M_MainWindow   Use case #: 5
Description: The user can see an explanation of what the Theme is.
Rationale: Helps the user understand the system better.
Source: Jean-Marc Desharnais
Fit Criterion: User hits a button and the explanation will come up
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:

Requirement #: 17

Requirement Type: M_MainWindow   Use case #: 5
Description: The user can see an explanation of what the Recommendation is.
Rationale: Helps the user understand the system better.
Source: Jean-Marc Desharnais
Fit Criterion: User hits a button and the explanation will come up
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:

Requirement #: 18

Requirement Type: M_Settings   Use case #: 6
Description: Changing the username and password of an user
Rationale: Standard
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: Changing the password inside the program.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 19

Requirement Type: M_Db   Use case #: 5
Description: Instructions on how to compact the database
Rationale: MS Access databases don't release storage space after deleting a row. As a result of that the application will become slow after using it, compacting it would solve this issue.
Source : Tim Kuessing
Fit Criterion:
Customer Satisfaction: 1
Customer Dissatisfaction: 1
Dependencies:

Requirement #: 20

Requirement Type: M_language   Use case #: 6
Description: Change of the current language of the program during run time. This will involve the menu bar, all buttons and labels as well as the case specific content of the expert system.
Rationale: Due to different nationality of users, they should be able to switch between the languages of interfaces and the knowledge base.
Source: Jean-Marc Desharnais
Fit Criterion: After changing the language, all forms and their content have to be in the desired language without re-installing or restarting the program
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 21

Requirement Type: M_Error   Use case #: none
Description: Exception handling to ensure that the tool is running stable (defined state). Inform user about problems through error warnings.
Rationale: To ensure system and data integrity
Source: Jean-Marc Desharnais
Fit Criterion:
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 22

Requirement Type: M_MainWindow   Use case #: 4
Description: Enter the quality of the available documentation with a slider
Rationale: Needed to verify uncertain information
Source: Jean-Marc Desharnais
Fit Criterion: Enter percentage for the quality of documentation
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 23

Requirement Type: E_Report   Use case #: 4
Description: Measurer activities will be reported at the end of the problem solving process. Log information about answered facts (thereunto KW, TC, CP, Theme), calculated recommendation plus session infos.
Rationale: For statistic reasons.
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: Produce Excel report about measurer activities
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Expert part:

Requirement #: 24

Requirement Type: E_Manage   Use case #: 11
Description: Add a keyword
Rationale: Knowledge acquisition
Source: Jean-Marc Desharnais

Fit Criterion: Successfully add a keyword means to enter the name, its description and path of rtf-file containing its explanation. Furthermore a user shall see what keywords are already registered to the system.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 25

Requirement Type: E_Manage   Use case #: 11
Description: Delete a keyword
Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: All related information (description, linked Topological Concepts) to this keyword has to be deleted, but if a related Topological Concepts is also related to other keywords, then don't delete it. On the other hand if a Topological Concept is only related to one particular keyword, then ask the user if he wants to delete it, too.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 26

Requirement Type: E_Manage   Use case #: 11
Description: Modify a keyword
Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: The user has to be able to change the description of a keyword and to modify and delete related Topological Concepts.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 27

Requirement Type: E_Manage   Use case #: 12
Description: Add a Topological Concept
Rationale: Knowledge acquisition
Source: Jean-Marc Desharnais
Fit Criterion: Successfully add a Topological Concept with its description, its path to the
reference file and a relationship percentage to a keyword
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 28

Requirement Type: E_Manage   Use case #:12
Description: Delete a Topological Concept
Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: Delete all the related information to this Topological Concept as well as
related Case Problems.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 29

Requirement Type: E_Manage   Use case #: 12
Description: Modify a Topological Concept
Rationale: Knowledge acquisition
Source: Jean-Marc Desharnais
Fit Criterion: Modify its name, description and relationship to a keyword.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:
Conflicts:
Supporting Materials:

Requirement #: 30

Requirement Type: E_Manage	Use case #: 13

Description: Add a Case Problem
Rationale: Knowledge acquisition
Source: Jean-Marc Desharnais
Fit Criterion: Successfully add a Case Problem (name, description, relationship to Topological Concept, path for reference file)
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 31

Requirement Type: E_Manage	Use case #: 13

Description: Delete a Case Problem
Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: Delete a Case Problem with all its attributes and related Themes and Recommendations.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 32

Requirement Type: E_Manage	Use case #: 13

Description: Modify a Case Problem
Rationale: Knowledge maintenance

Source: Jean-Marc Desharnais
Fit Criterion: Modify its name, description and relationship to a Topological Concept.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 33

Requirement Type: E_Manage   Use case #: 14
Description: Add a Theme
Rationale: Knowledge acquisition
Source: Jean-Marc Desharnais
Fit Criterion: Successfully add a Theme (name, description, relationship to Case Problem, path for reference file)
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 34

Requirement Type: E_Manage   Use case #:14
Description: Delete a Theme
Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: Delete a Theme with all its attributes and if related Facts.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 35	
Requirement Type: E_Manage	Use case #: 14
Description: Modify a Theme	
Rationale: Knowledge maintenance	
Source: Jean-Marc Desharnais	
Fit Criterion: Modify its name, description and relationship to a Case Problem.	
Customer Satisfaction: 5	
Customer Dissatisfaction: 5	
Dependencies:	

Requirement #: 36	
Requirement Type: E_Manage	Use case #: 16
Description: Add a Fact	
Rationale: Knowledge acquisition	
Source: Jean-Marc Desharnais	
Fit Criterion: Successfully add a Fact (name, description, relationship to Theme, path to reference file)	
Customer Satisfaction: 5	
Customer Dissatisfaction: 5	
Dependencies:	
Conflicts:	
Supporting Materials:	

Requirement #: 37	
Requirement Type: E_Manage	Use case #: 16
Description: Delete a Fact	

Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: Delete a Fact with all its attributes in all languages
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 38

Requirement Type: E_Manage   Use case #: 16
Description: Modify a Fact
Rationale: Knowledge acquisition
Source: Jean-Marc Desharnais
Fit Criterion: Modify its name, description and relationship to a Theme.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 39

Requirement Type: E_Manage   Use case #: 15
Description: Add Recommendation
Rationale: Knowledge acquisition
Source: Jean-Marc Desharnais
Fit Criterion: Successfully add a Recommendation (name, description, relationship to
Case Problem, path to reference file)
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 40

Requirement Type: E_Manage	Use case #: 15

Description: Delete Recommendation
Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: Delete a Recommendation with all its attributes in all languages.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 41

Requirement Type: E_Manage	Use case #: 15

Description: Modify a Recommendation
Rationale: Knowledge maintenance
Source: Jean-Marc Desharnais
Fit Criterion: Modify its name, description and relationship to a Case Problem.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:
Conflicts:
Supporting Materials:

Requirement #: 42

Requirement Type: E_Manage	Use case #: 17

Description: Select a diagnostic model
Rationale: The expert has to be able to choose from three different diagnostic model

which stand for different ways of reasoning recommendations.
Source: Jean-Marc Desharnais
Fit Criterion: Choose a diagnostic model on a form.
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:

Requirement #: 43

Requirement Type: E_Manage   Use case #: 20
Description: Change the caption of the user interfaces (forms, controls)
Rationale: The expert shall be able to adjust the user-interface to his needs/domain
Source: Jean-Marc Desharnais
Fit Criterion: Edit caption of buttons, forms, menus and their items, labels, text boxes and datagrid headers.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 44

Requirement Type: E_Manage   Use case #: 18
Description: Produce an Excel sheet with "measurer follow up" information
Rationale: For statistic reasons.
Source: Jean-Marc Desharnais
Fit Criterion: Measurer Follow Up information in Excel format
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 45

Requirement Type: E_Manage   Use case #: 18
Description: Produce an Excel sheet with "Session" information
Rationale: For statistic reasons
Source: Jean-Marc Desharnais
Fit Criterion: Session information in Excel format.
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:

Requirement #: 46

Requirement Type: E_Manage   Use case #: 18
Description: Delete Measurer Follow Up report either by days older than x or
completely.
Rationale: Avoiding huge tables with information which is no longer necessary.
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: Deleted rows in class "measurer follow up"
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:
Conflicts:
Supporting Materials:

Requirement #: 47

Requirement Type: E_Manage   Use case #: 18
Description: Delete session report either by days older than x or completely.

Rationale: Avoiding huge tables with information which is no longer necessary
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: Deleted rows in class "session"
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 48

Requirement Type: E_Manage   Use case #: 21
Description: The expert has to have all the functionality of a measurer
Rationale:
Source: Jean-Marc Desharnais
Fit Criterion:
Customer Satisfaction:
Customer Dissatisfaction:
Dependencies:
Conflicts:
Supporting Materials:

Requirement #: 49

Requirement Type: E_MaintainKnowledge   Use case #: 11-16
Description: Modify a language-set6 of Keywords, TCs, CPs, Themes, Recommendations and Facts
Rationale: A keyword will be added in one language, that means an expert must have the opportunity to translate his new entered keyword into other languages. That will result in a multiple language knowledge (Case) base.
Source: Tim Kuessing
Fit Criterion: Modifying keywords in different languages
Customer Satisfaction: 3
Customer Dissatisfaction: 3
Dependencies:

---

6 A "language-set" is one keyword (or TC, CP, Theme, Fact, Recommendatiob) presented in its four languages

Requirement #: 50

Requirement Type: E_MaintainKnowledge   Use case #: 22
Description: Drag and drop Case Problems, Themes, Facts or Recommendations
Rationale: The same Case Problems (or others) might be necessary within two different
Topological Concepts and to save time a drag & drop function would be good.
Source: Jean-Marc Desharnais
Fit Criterion: Drag and drop the highlighted item and the hierarchel levels underneath.
Possible drop items have to marked different from impossible ones. For example a Fact
can only be dropped on a Theme.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 51

Requirement Type: E_MaintainKnowledge   Use case #: 22
Description: Copy a Case Problem, Theme, Fact or Recommendation
Rationale: The same Case Problems (or others) might be necessary within two different
Topological Concepts and to save time a copy function would be good.
Source: Jean-Marc Desharnais
Fit Criterion: When copying the hierarchical level underneath have to be copied as well
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 52

Requirement Type: E_MaintainKnowledge   Use case #: 22
Description: Cut a Case Problem, Theme, Fact or Recommendation
Rationale: A Case Problem (or other) can become obsolete for one Topological Concept,
but might be interesting to consider in an other. For that case a cut function would be
good.
Source: Jean-Marc Desharnais
Fit Criterion: Cut an item with its layers underneath
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 53

Requirement Type: E_MaintainKnowledge   Use case #: 22
Description: Paste a Case Problem, Theme, Fact or Recommendation
Rationale: To complete the copy and cut process.
Source: Jean-Marc Desharnais
Fit Criterion: A copied or cutted item shall be pasted into its new position
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 54

Requirement Type: E_MaintainKnowledge   Use case #: 11-16, 22
Description: Query Properties of Keyword, Topological Concept, CP, Theme, Fact, Recommendation
Rationale: Presentation of knowledge base
Source: Jean-Marc Desharnais
Fit Criterion: Displaying items and its properties and links to sub items
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 55

Requirement Type: E_MaintainKnowledge   Use case #: 22
Description: Show description of item in tree view in text box
Rationale: Expert information
Source: Jean-Marc Desharnais
Fit Criterion: When selecting an item of the tree view, its description has to show up a text box.
Customer Satisfaction: 5
Customer Dissatisfaction: 5
Dependencies:

Requirement #: 56

Requirement Type: E_Report   Use case #: 18
Description: A list presenting the relationship between all Keywords and their
Topological Concepts
Rationale: Gives the expert an overview of the existing relationships between keywords
and Topological Concept. It'll help him to maintain the case specific data.
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: By clicking on a specific-button in the menu a list shall come up with the
three columns: Keyword, Tological Concept and the relationship between both.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 57

Requirement Type: E_Report   Use case #: 18
Description: A list presenting the relationship between all TCs and their Case Problems
Rationale: Gives the expert an overview of the existing relationships between TCs and
Case Problems. It'll help him to maintain the case specific data.
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: By clicking on a specific-button in the menu a list shall come up with the
three columns: TC, Case Problem and the relationship between both.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 58

Requirement Type: E_Report   Use case #: 18
Description: A list presenting the relationship between all Case Problems and their
Themes
Rationale: Gives the expert an overview of the existing relationships between CPs and
Themes. It'll help him to maintain the case specific data.
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: By clicking on a specific-button in the menu a list shall come up with the
three columns Case Problem, Theme and the relationship between both.
Customer Satisfaction: 4
Customer Dissatisfaction: 4

Dependencies:

Requirement #: 59

Requirement Type: E_Report   Use case #: 18
Description: A list presenting the relationship between all CP and their Recommendations
Rationale: Gives the expert an overview of the existing relationships between CP and Recommendations. It'll help him to maintain the case specific data.
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: By clicking on a specific-button in the menu a list shall come up with the three columns: CP, Recommendations and the relationship between both.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 60

Requirement Type: E_Report   Use case #: 18
Description: A list presenting the relationship between all Themes and their Facts
Rationale: Gives the expert an overview of the existing relationships between Themes and Facts. It'll help him to maintain the case specific data.
Source: Jean-Marc Desharnais, Tim Kuessing
Fit Criterion: By clicking on a specific-button in the menu a list shall come up with the three columns: Theme, Fact and the relationship between both.
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Administrator

Requirement #: 61

Requirement Type: E_Manage   Use case #: 31
Description: Manage7 the users
Rationale: Only the administrator is allowed to add, delete a user or grant certain access to the system.
Source: Jean-Marc Desharnais
Fit Criterion: The edit user interface must be hidden for experts an measurers
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

Requirement #: 62

Requirement Type: E_Manage   Use case #: 21/22
Description: An Administrator has to have all the functionality of an expert.
Rationale: Only the administrator is allowed to add, delete a user or grant certain access to the system.
Source: Jean-Marc Desharnais
Fit Criterion: The edit user interface must be hidden for experts an measurers
Customer Satisfaction: 4
Customer Dissatisfaction: 4
Dependencies:

---

7 *"Manage"* means to add, modify and delete

Data requirements.
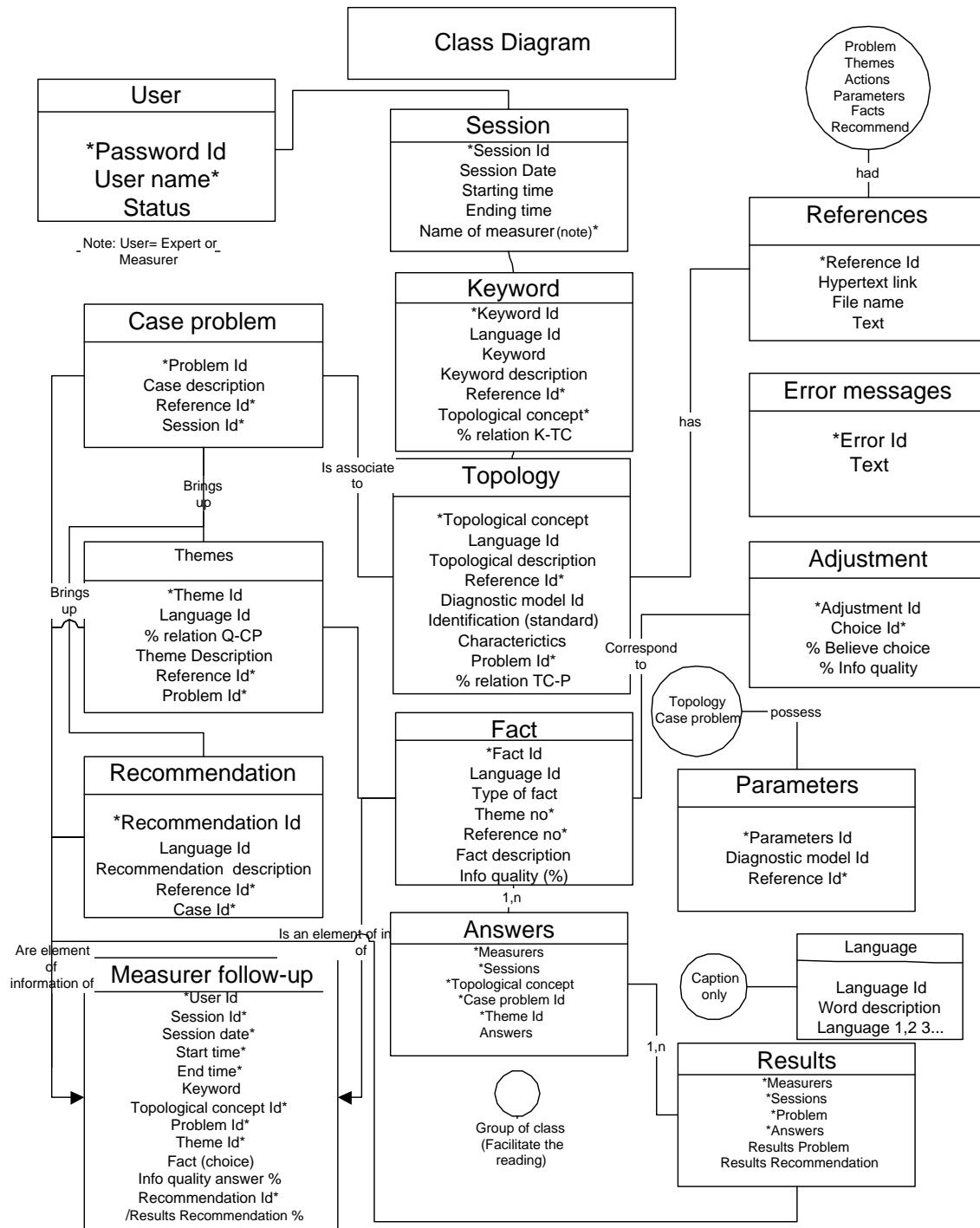
Figure 2: Data model

L'anglais du texte qui suit a été corrigé partout ou il était possible de le faire. Cependant, pour les "copies" en format image des différentes écrans du logiciel ce ne fut pas possible.

Annexe B: partie 2
USER GUIDE FOR COSMICXPERT
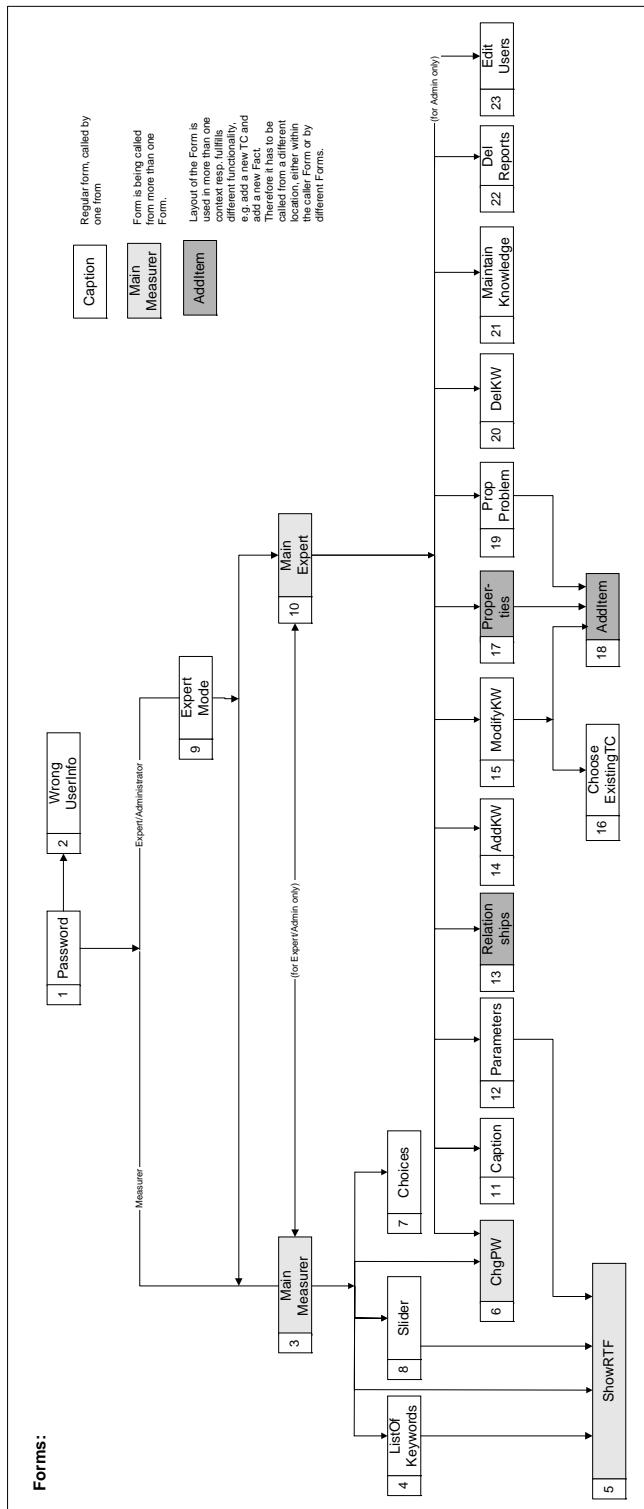
Figure 1: Menu

This user guide provides an overview of COSMICXPERT, explaining its forms and their functions. The chapter is subdivided into sections subtitled Start Forms, Measurer Interface, Expert Mode and Administrator Mode. Note that the numbers in Figure 39 correspond to the numbers in the Table of Contents for forms on the next page.

List of Forms

Start Forms

Figure 2: Entering COSMICXPERT

To enter the system, username and password are provided by the user. If they are valid, access is granted to the tools' functionality in accordance with the status of the user. A measurer, for example, sees the screen in Figure 2 and can solve a measurement problem, while an expert or administrator sees the screen in Figure 11, called Expert Mode, and can either maintain the system or solve a problem.
If the expiry date has passed, the user will be informed to contact the owner of the product.
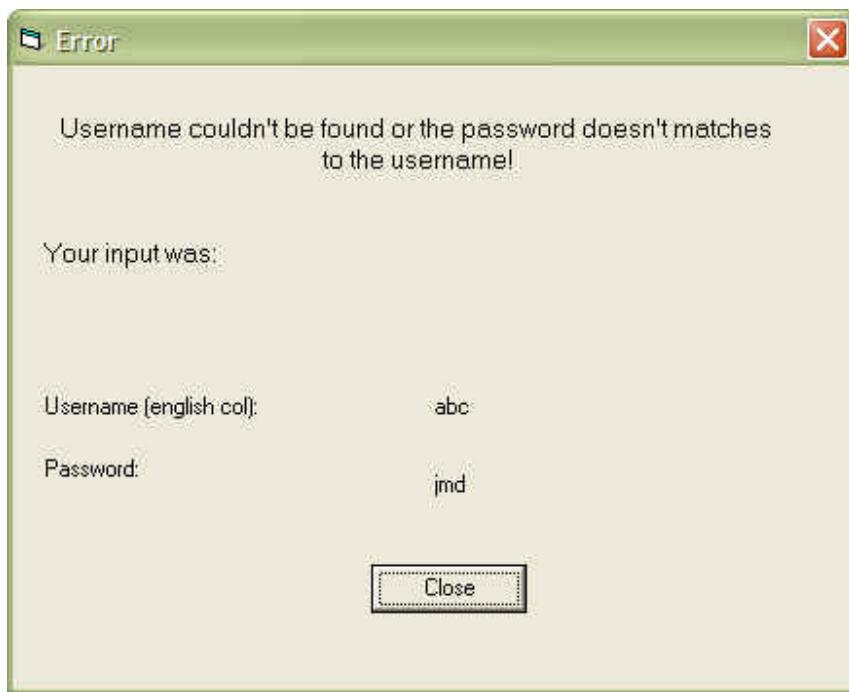
Figure 3: Wrong Password

This screen (Figure 3) comes up if the user entered the wrong password in Figure 2, and gives the username and password entered. The Close button brings the user back to the screen in Figure 2 so that the necessary correction(s) can be made.
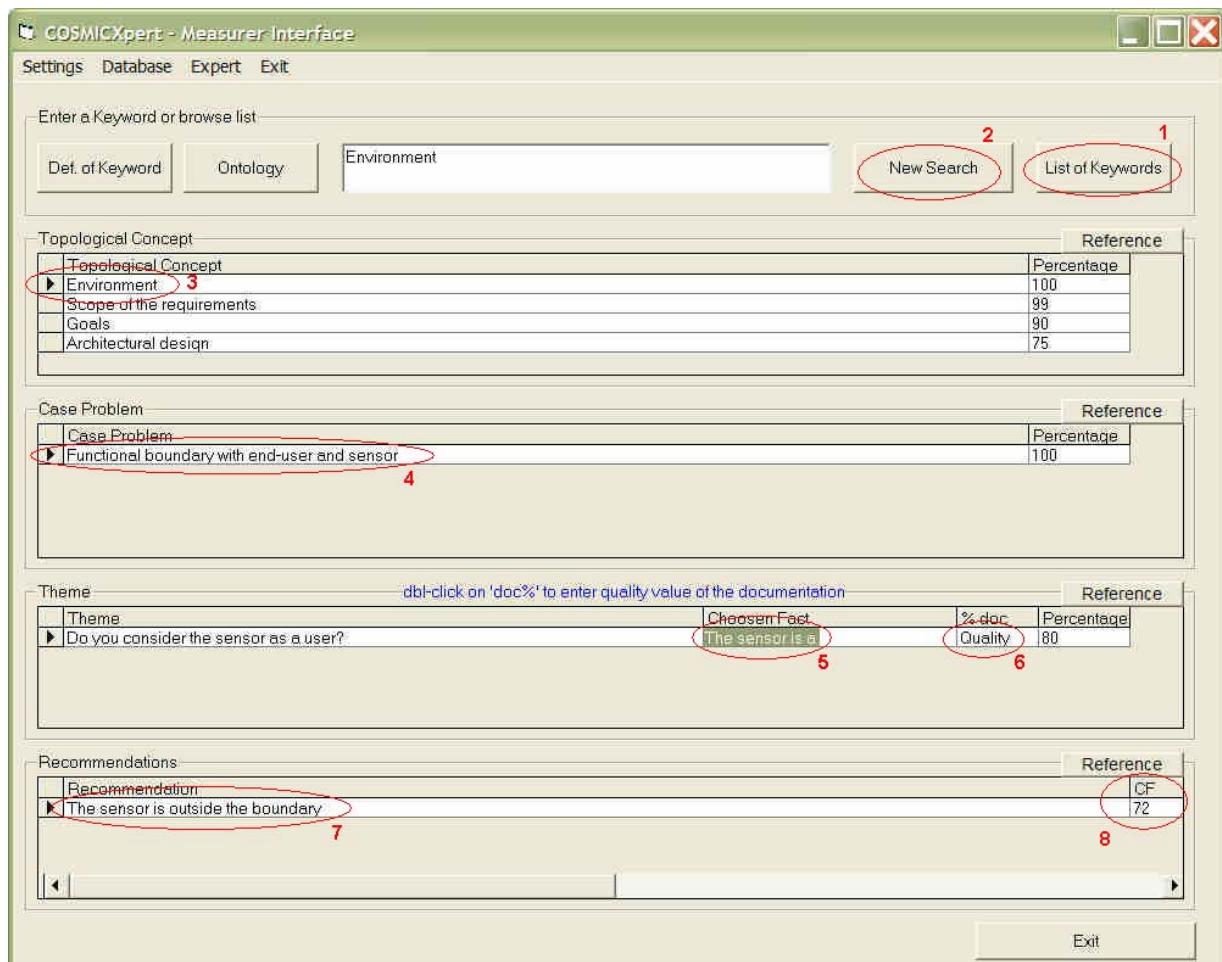
Measurer Interface

Figure 4: Measurer Interface for solving a problem

This is the screen the measurer uses to solve a measurement problem. As described in Figure 4, the user can either enter a keyword or browse through a list of keywords by pressing the List of Keywords button, marked (1) in the Measurer Interface. After selecting a keyword and pressing the New Search button (2), the expert system displays

the affected TC, CP and Themes. The TC (3) or the CP (4) can now be deleted by marking a row on the data grid and pressing Delete on the user's keyboard. CPs and Themes are automatically updated in response to the new situation.

The next step is to answer a theme by choosing a Fact. To do this, the user double-clicks on the Chosen Fact field (5), at which point a window with multiple Facts appears. Double-clicking on the Quality field (6) provides the means for entering the measurer's confidence level in the selected Fact. This confidence level essentially depends on the quality of the measurer's documentation.

After answering a Theme or changing the quality rating of the documentation, recommendations are recalculated and displayed (7) on the Recommendations data grid. CF is the computed value and stands for "certainty factor" (8).

Percentage on the TC data grids indicates the extent of the link between a specific TC and the Keyword selected in the text box above. The same principle applies for the percentages on the other data grids, e.g. the percentage attached to a CP expresses the relationship between this CP and the TC related to it.

A right-click on a row of a data grid produces a pop-up menu giving an explanation of the item.

On the Measurer Interface, there are three more buttons, labeled Def. of Keyword, Ontology and Reference. Clicking on these produces a rich text file explaining and defining specific vocabulary.
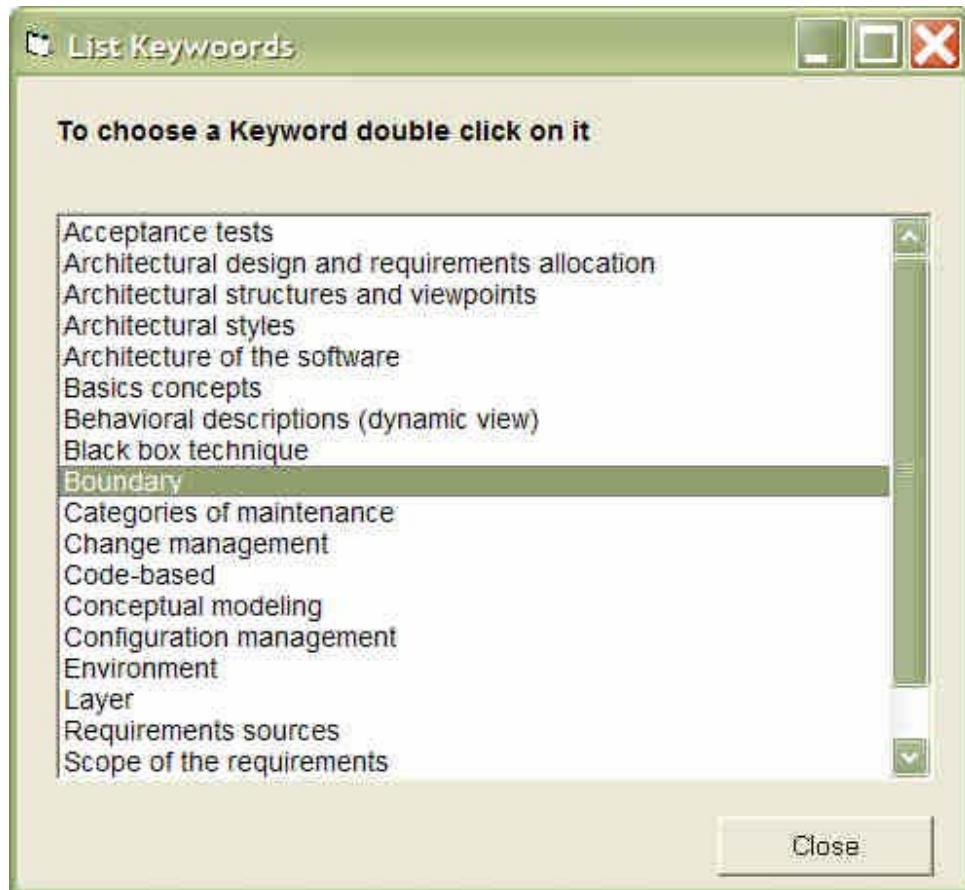
Figure 5: List of Keywords

This screen (Figure 5) comes up when the List of Keywords button has been pressed on the Measurer Interface. It gives the user an overview of the Keywords contained in the Knowledge Base. Keywords are selected by simply double-clicking on the desired one, or highlighting it, and hitting Close. It is also possible to ask for a description by right-clicking on a highlighted item.
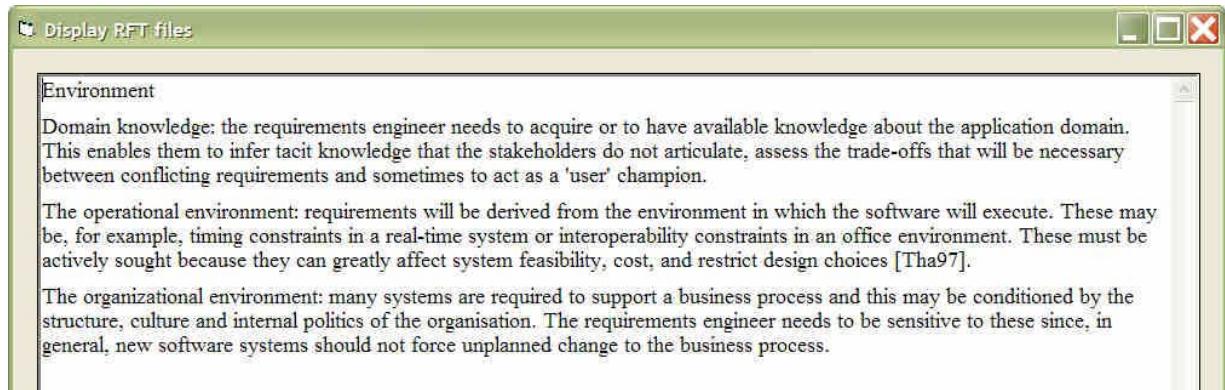
Figure 6: A rich text file (top part as is, no correction)

When the user asks for a long reference or an explanation, this window, which can display rich text files, comes up (Figure 6). User actions are limited to scrolling through the document or closing it.
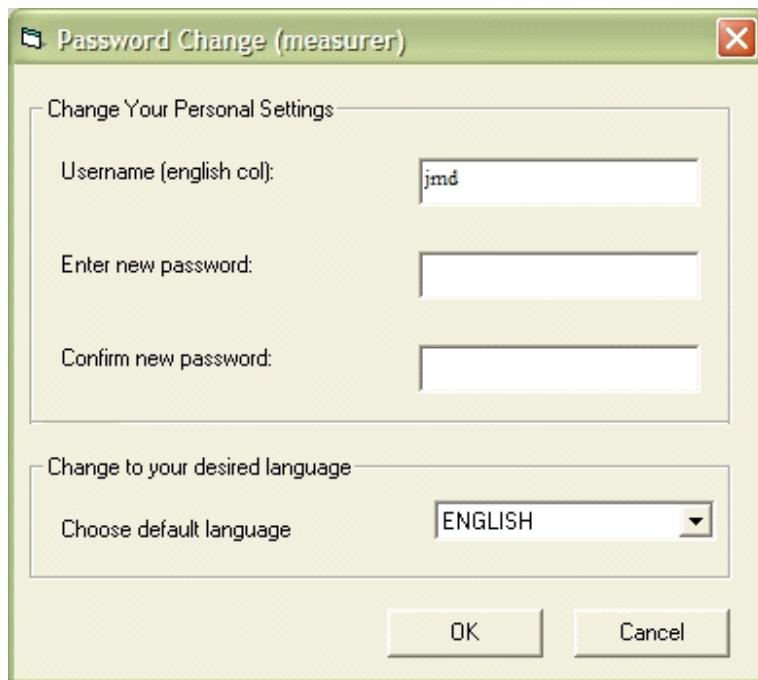
Figure 7: User settings

This screen is designed to manage the username, password and desired language of the individual currently logged in. It can be reached from the Measurer Interface by clicking on Settings and the sub-item User on the menu bar.
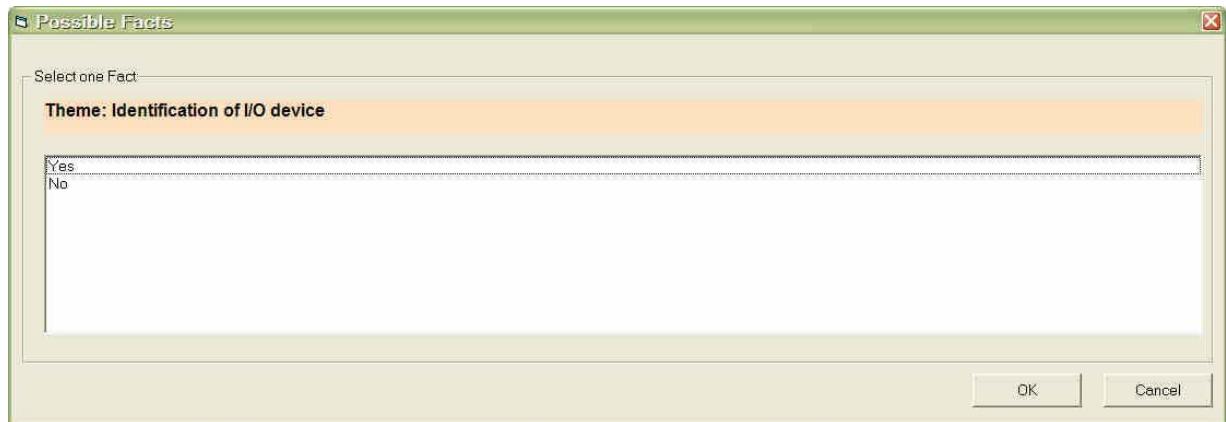
Figure 8: Making a choice

This Possible Facts screen (Figure 8) appears when the user selects a Theme to answer on the screen in Figure 5 and double-clicks on it. The selected Theme to be answered is repeated, the list box underneath it containing multiple valid Facts). As in Windows™, the user can either highlight a choice and hit OK or just double-click on the desired Fact. The screen then closes and the user can see the Fact right next to the Theme in the Chosen Fact column on Form 3.
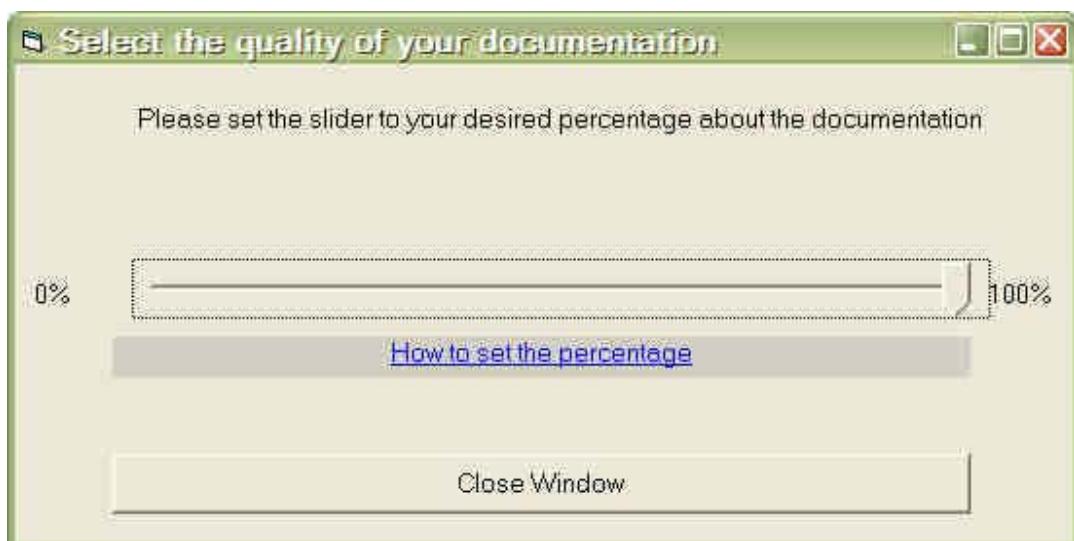
Figure 9: Entering the quality of the documentation

The text should be read: "Please set the slider to reflect your assessment of documentation quality"

The quality of the documentation for a particular Theme can be specified by double-clicking in the % doc column of Quality. The input here depends on the Theme selected. Figure 9 then pops up and offers the chance to enter the quality of the documentation in a range between 0% and 100%. Underneath the slider, the hyperlink "How to set the percentage" can be found, indicating suitable ranges for well documented, good, etc.

As usual, the Close button saves the setting to the database and closes the window so that the measurer can continue "working" on the problem at hand.

Expert Mode
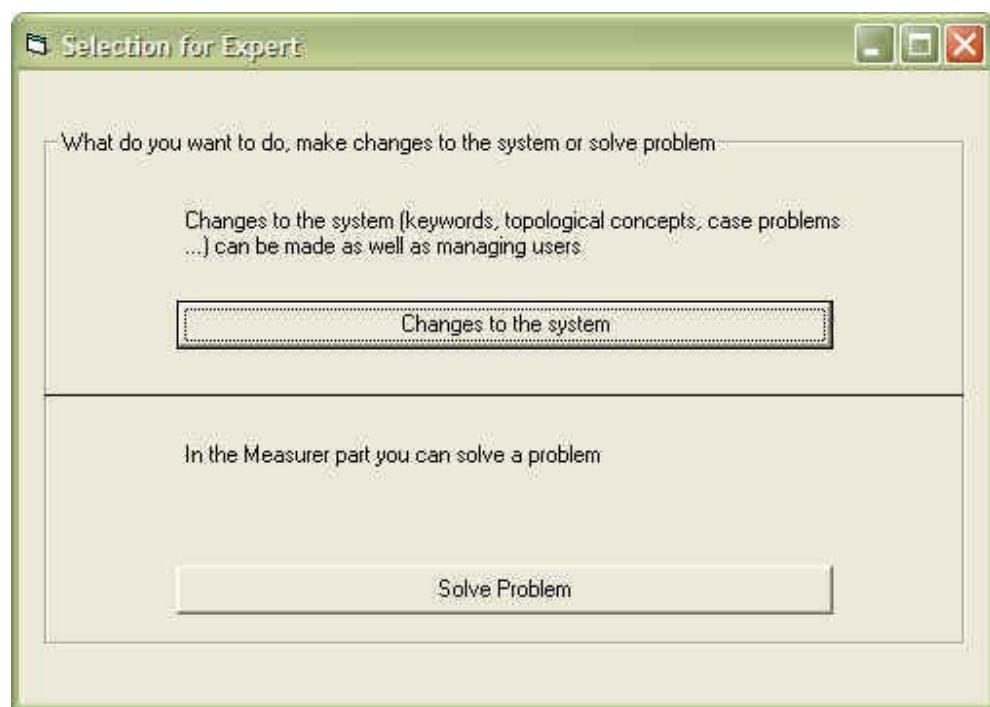
Figure 10: Expert Mode

This is a very basic screen. The expert has access to the same functionality as the measurer, so it seemed convenient to provide a screen through which the expert can choose the scope of his work: "maintaining the system" or "solving a measurement problem." The expert makes his selection, and is guided by the program towards either solving a problem or maintaining the system.
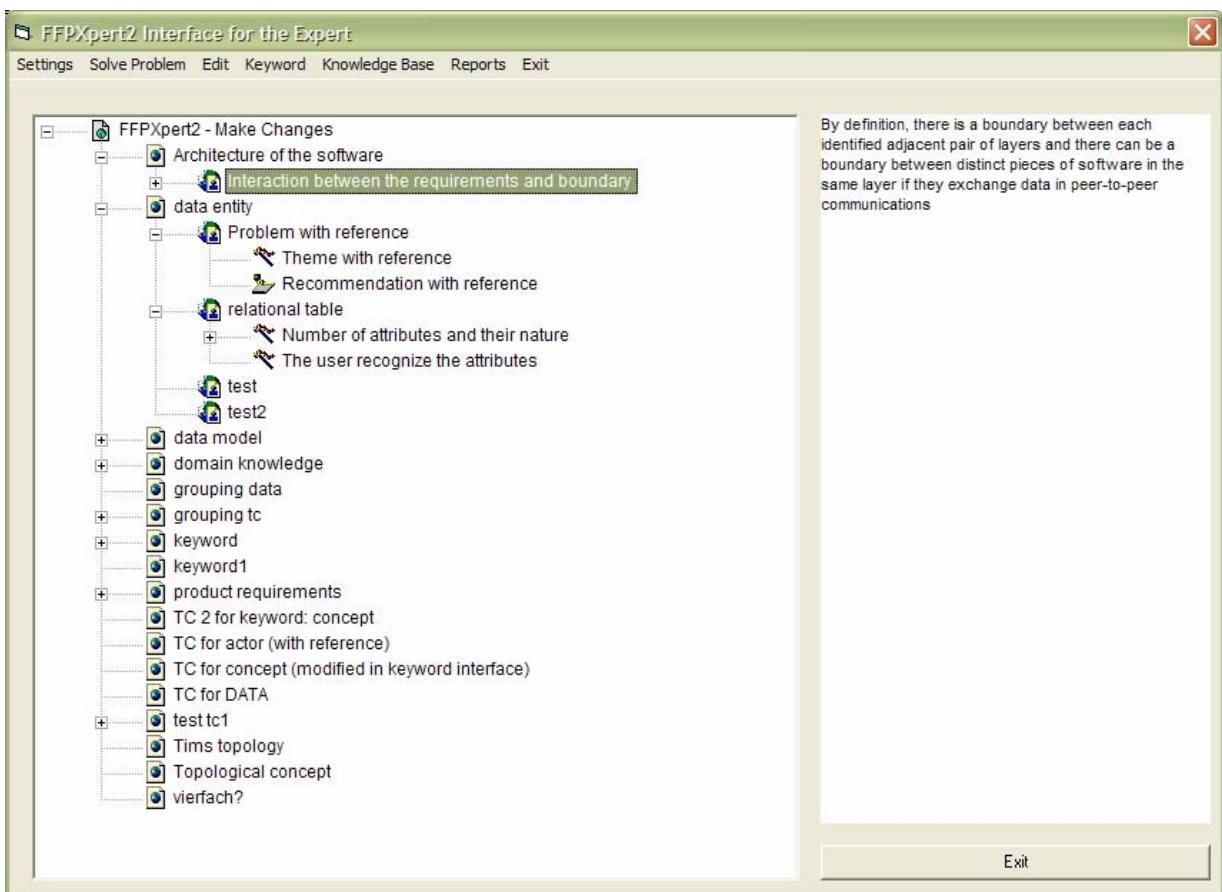
Figure 11: Expert Interface for managing the Knowledge Base

This is the main screen from which the expert operates. The left field is called a Tree view and visualizes the structure of the case-specific knowledge. Underneath the starting point of the Tree view, the root item, there are Topological Concepts, followed by related Case Problems. At the next level can be seen the Themes and Recommendations to which the Case Problem or interest is related. At the fifth level, under Themes, are the possible Facts available for answering a Theme. To see how strong the relationship is between the nodes, the highlighted node can be right-clicked and properties from the pop-up menu selected. This guides the user to screens which provide further details and the option of making adjustments.

When the user selects a node in the Tree view, its description appears in the text box to the right.

Concerning functionality in this window, it is possible to drag and drop nodes, but, unlike Windows Explorer™, COSMICXPERT requires that nodes have to be dropped at the right place, otherwise an error message appears.

The "right place" means:

Facts can only be dropped on Themes,

…Themes on Case Problems,

…Recommendations on Case Problems, and

…Case Problems on Themes;

Topological Concepts have to be bound to a Keyword through the interface function Modify Keyword because of their n:m relationship.

The user can also copy or cut and paste nodes, either by employing Edit on the menu bar or by using the Windows-like shortcuts Ctrl+C, Ctrl+X and Ctrl+V. Of course, nodes can be deleted by hitting Delete on the keyboard or using Delete in the Edit menu.

The Settings option on the menu bar is the home of links to screens where personal settings like username, password and language can be modified and the captions of buttons, labels, frames, data grids, etc. can be adapted (Form 11). The user can also choose from three diagnostic models (**Erreur ! Source du renvoi introuvable.**).

The next item on the menu bar, Solve a Problem, opens the Measurer Interface.

The Keyword menu is needed to add (**Erreur ! Source du renvoi introuvable.**), modify (Form 15) or delete (Form 20) keywords which cannot be displayed in the Tree view due to their n:m relationship to Topological Concepts. Tree views can only display 1:n relationships.

The Maintain Knowledge option will lead the expert to an interface (Form 21) where case-specific knowledge can be translated into other languages.

On the Reports menu, reports displaying the relationships among all existing Keywords and Topological Concepts, Topological Concepts and Case Problems, Case Problems and Themes, etc. (Form 13) are differentiated from reports created for statistical reasons.

There are two statistical reports (Excel™ format), one providing information about who has entered the system and when, and the other being a "log-file" of the problem-solving process carried out by a measurer answering Themes and providing information about the quality of documentation.

English	French	German	Italian
&Add	&Ajouter	&Einfügen	&Add
&Caption	&Caption	&Beschriftung	&Caption
&Copy	&Copier	&Kopieren	&Copy
&Delete	&Enlever	&Löschen	&Delete
&Delete	&Enlever	&Löschen	&Delete
&Deleted Items	&Enlever un item	&Löschen	&Deleted Items
&Diagnostic Model	&Modèle Diagnostique	&Diagnose Model	&Diagnostic Model
&Edit	&Editer	&Editieren	&Edit
&Keyword	&Mot clef	&Schlüsselwort	&Keyword
&Modify	&Modifier	&ändern	&Modify
&Paste	&Coller	&Einfügen	&Paste
&Reports	&Rapports	&Reports	&Reports
&Settings	&Ajustements	&Einstellungen	&Settings (italian)
&Settings	&Ajustements	&Einstellungen	&Settings (italian)
11	11	11	11
113	113	113	113
12	12	12	12
Add	Ajouter	Hinzufügen	Add
Add	Ajouter	Hinzufügen	Add
Add an existing Topological Concept	Ajouter un concept topologique exixtant	Bestehendes Topological Concept hinzuf	Add an existing Topological Co
Add item	Ajouter un item	Hinzufügen	Add item
Add Item	Ajouter un item	Hinzufügen	Add Item
Add Keyword	Ajouter un mot clef	Schlüsselwort hinzufügen	Add Keyword
Add Recommendation	Ajouter une recommandation	Empfehlung hinzufügen	Add Recommendation
Add Theme	Ajouter un thème	Theme hinzufügen	Add Theme
Add Topological Concept	Ajouter un concept topologique	Topological Concept hinzufügen	Add Topological Concept
Adhoc	Adhoc	Adhoc	Adhoc
auf 1 verwiesen!	auf 1 verwiesen!	auf 1 verwiesen!	auf 1 verwiesen!
auf 2 verwiesen!	auf 2 verwiesen!	auf 2 verwiesen!	auf 2 verwiesen!
Browse records	Parcourir les entrées	Datensatz	Browse records
C&ut	C&ouper	&Ausschneiden	C&ut
Cancel	Annuler	Abbrechen	Cancel
Cancel	Annuler	Abbrechen	Cancel
Cancel	Annuler	Abbrechen	Cancel

Figure 12: Editing captions

The other language issue involves changing the captions of buttons, menu bars, labels, etc. to match the selected language. The caption itself can be modified on this form, and is accessible through the menu bar (Settings, Caption) for the Expert Interface. There are four columns, one for each of the languages offered. Scrolling further to the right reveals the attribution of the control. Every control is part of a Form, and the location description is unique.
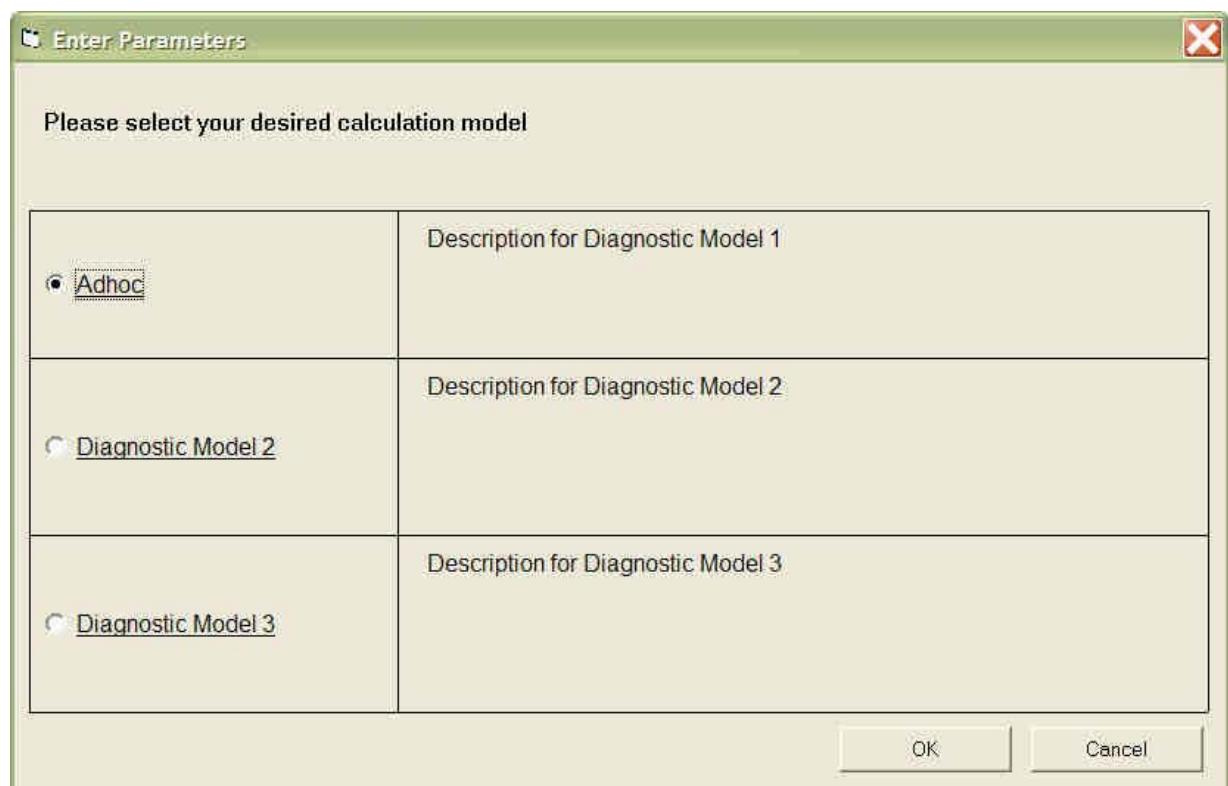
Figure 13: Enter parameters to select a diagnostic model

In future, it should be possible to select different diagnostic models for computing appropriate Recommendations. However, at the time of development, only the certainty theory had been prepared for implementation. With this screen, the expert can select the desired model, but as yet this choice cannot be implemented.

Figure 14: Relationships between case-specific data

To maintain case-specific knowledge, it is very useful to have a screen showing already existing Case Problems and the Themes to which they correspond, with an indication of how strongly they are linked. Of course, it is important to see the whole expert knowledge relationship. Therefore, access is given through the Reports menu, where links can be found displaying the affinity between:
Keyword – Topological Concept
Topological Concept – Case Problem
Case Problem –Theme
Theme – Fact
Case Problem – Recommendation
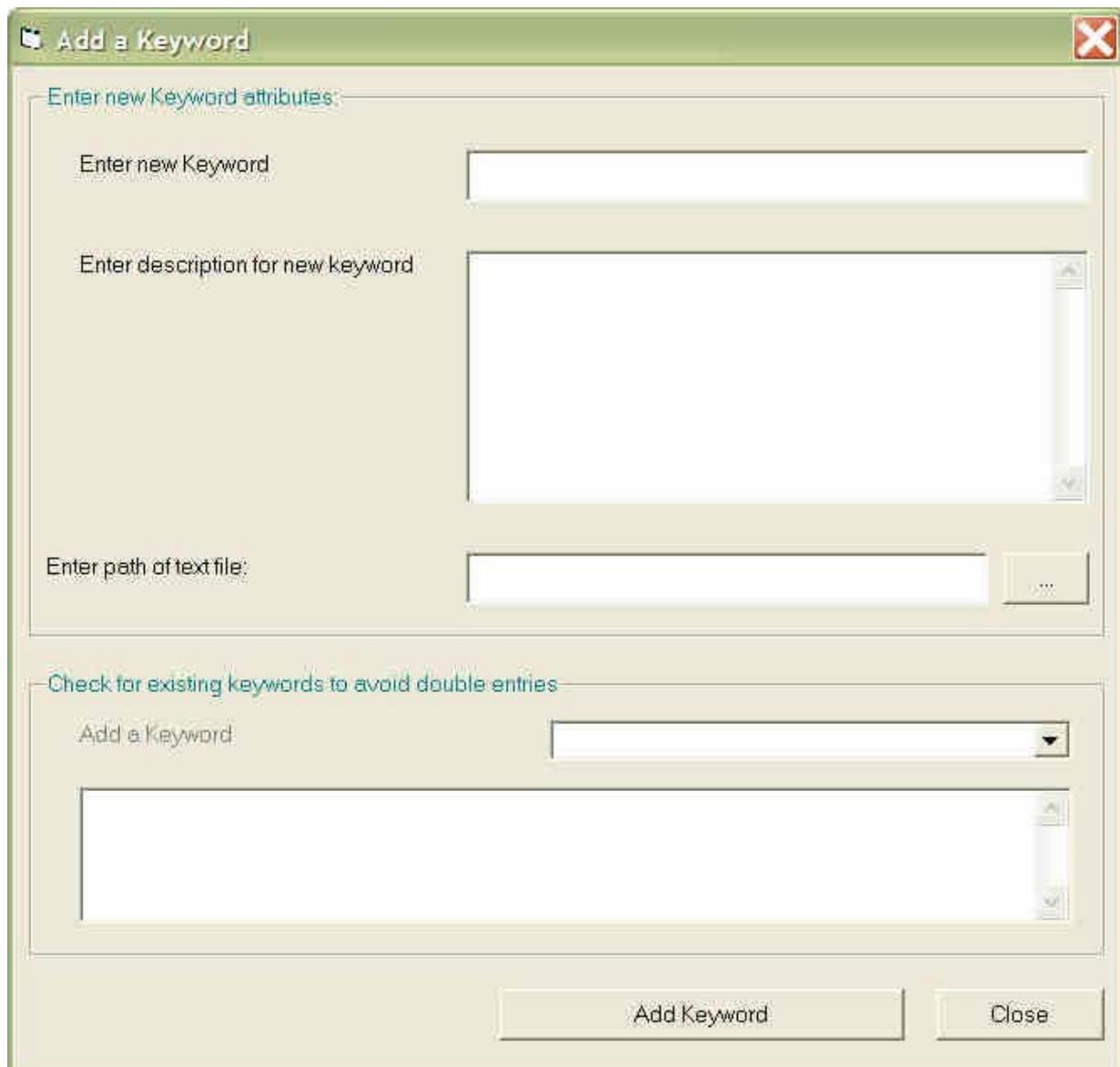
Figure 15: Adding a Keyword

The new keyword is entered on this simple form, along with its description and name (including extension). As an additional feature, the user can browse through a list of keywords to avoid similar entries. Of course, the system does not allow the same keyword to be entered more than once.
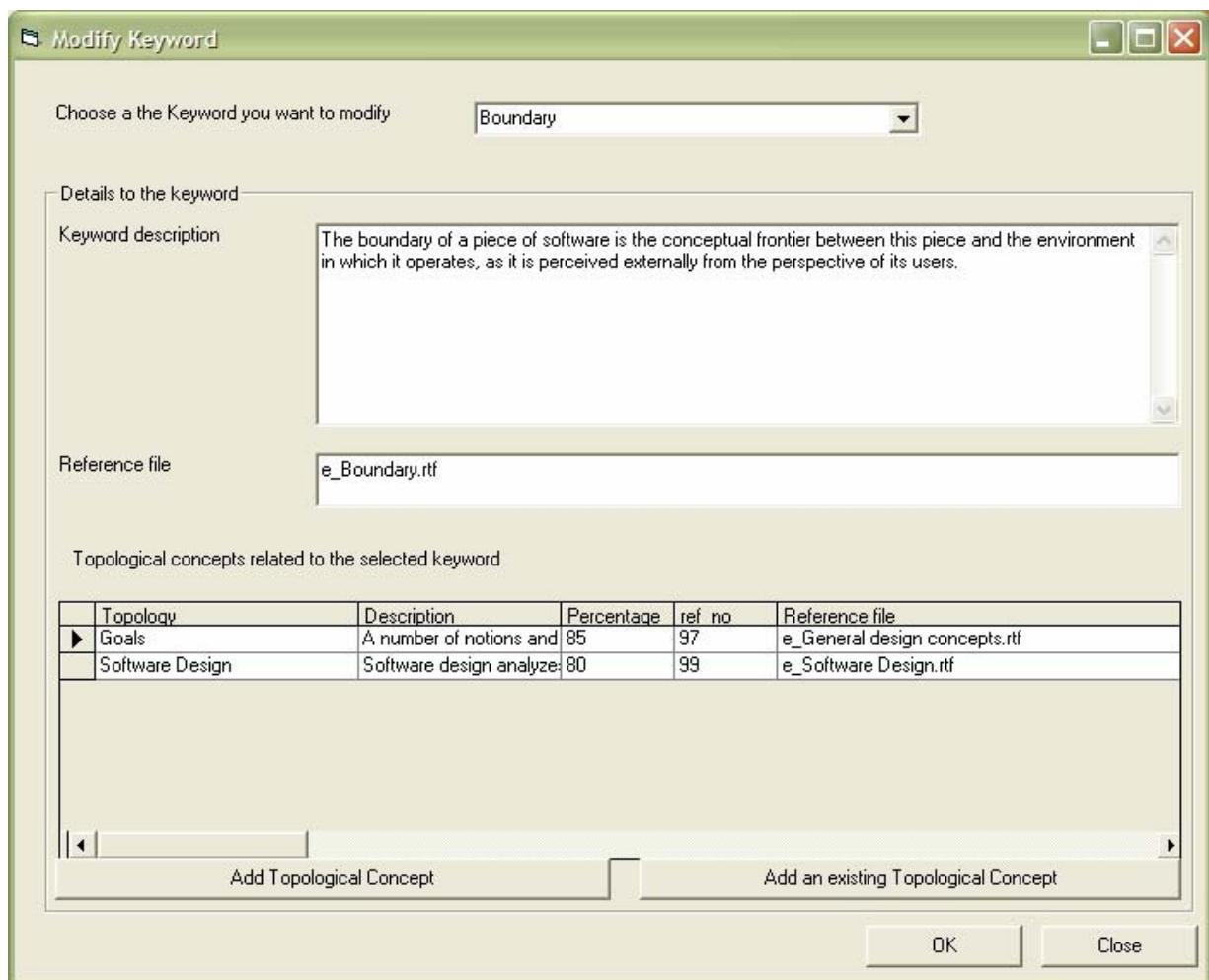
Figure 16: Modifying Keywords

Here, the expert can modify a keyword's description, reference file name or related TCs. The keyword itself cannot be modified, only added or deleted, in order to avoid confusion. There are two buttons to link a TC with the selected keyword. The user can either choose from a list of existing keywords or add a completely new TC.
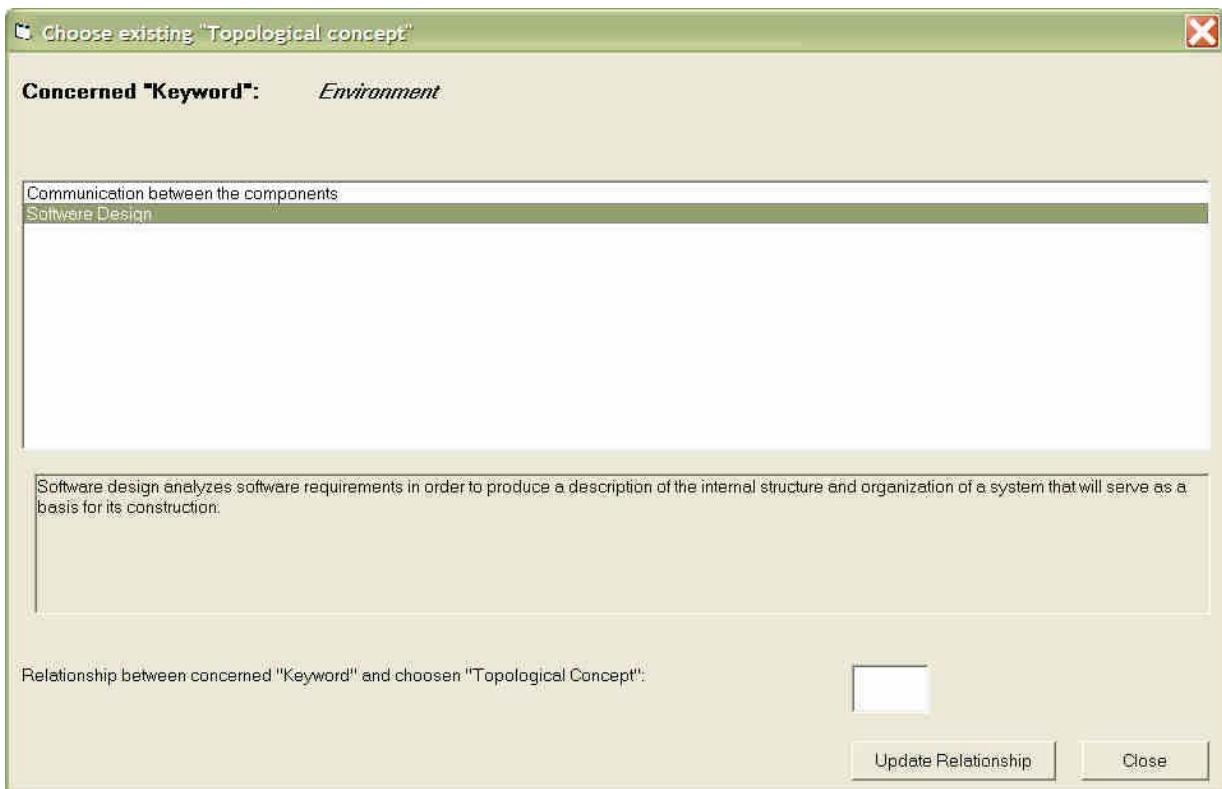
Figure 17: Adding an existing TC to a Keyword

The first line shows the Keyword to which the TC will be added, and the list box contains the available TCs. To add a TC, the user simply highlights that TC and supplies the relationship percentage. The description, reference file and links to related CPs, Themes, Facts and Recommendations are copied as well.
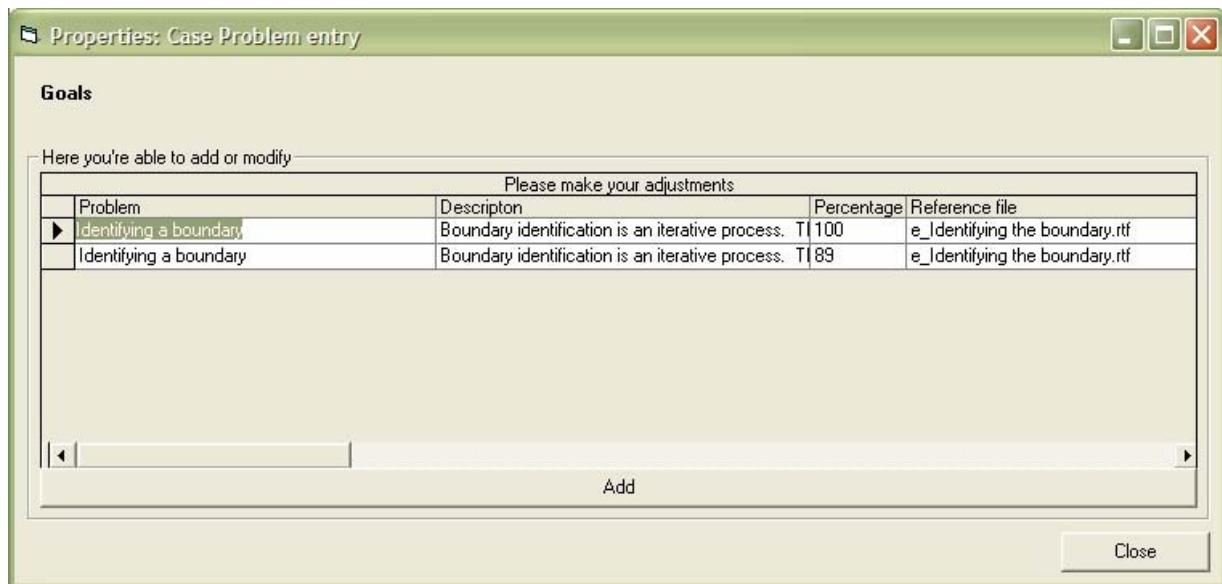
Figure 18: Properties of a Topological Concept

The title within Figure 18 and 19 should be: "Here is where you can add or modify"
To get to this window, the user selects a TC and right-clicks on it in Tree view. A menu pops up from which the Properties item can be chosen (also accessible through the menu bar). In the first line, the TC is displayed, with the related CP in the table underneath. All CP properties can be modified here, or a new problem added by pressing the Add button. To add an existing CP to a TC, the drag and drop function in the Tree view of the Expert Interface should be used.
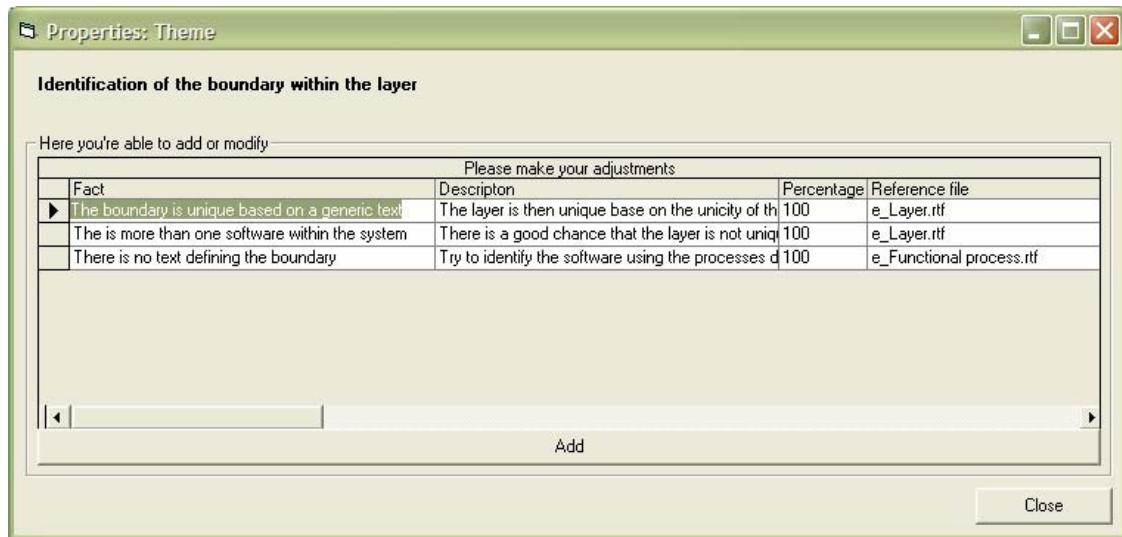
Figure 19: Properties of a Theme

This screen is very similar to the one in Figure 18, except that TC is replaced by Theme and CP is replaced by Facts.
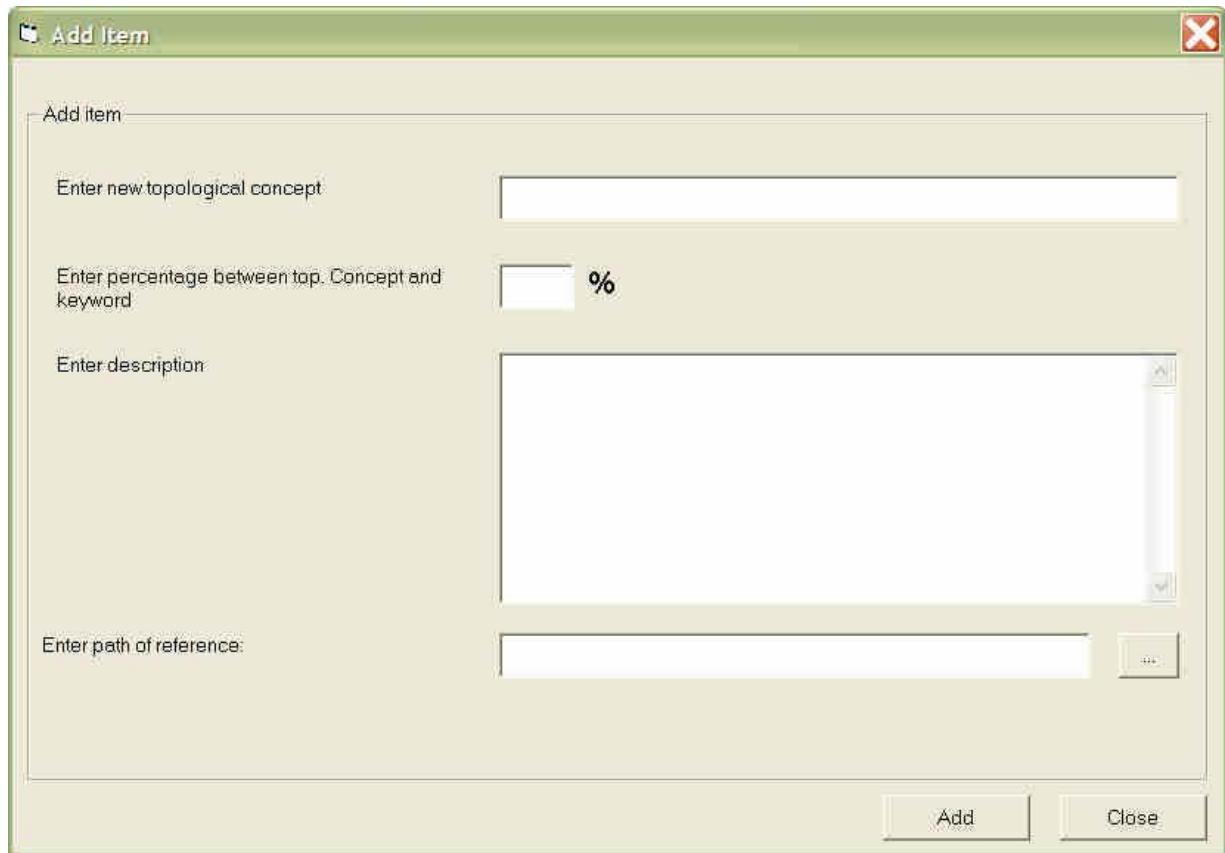
Figure 20: Adding an item

The Add Item function is used to enter new TCs, CPs, Themes and Facts. Recommendation uses the same interface, with the slight difference that instead of one percentage for the relationship, a range, a min and a max have to be provided. This screen appears after the Add Topological Concept button in Figure 16 (Modify Keyword) has been pressed. Not all fields are mandatory!
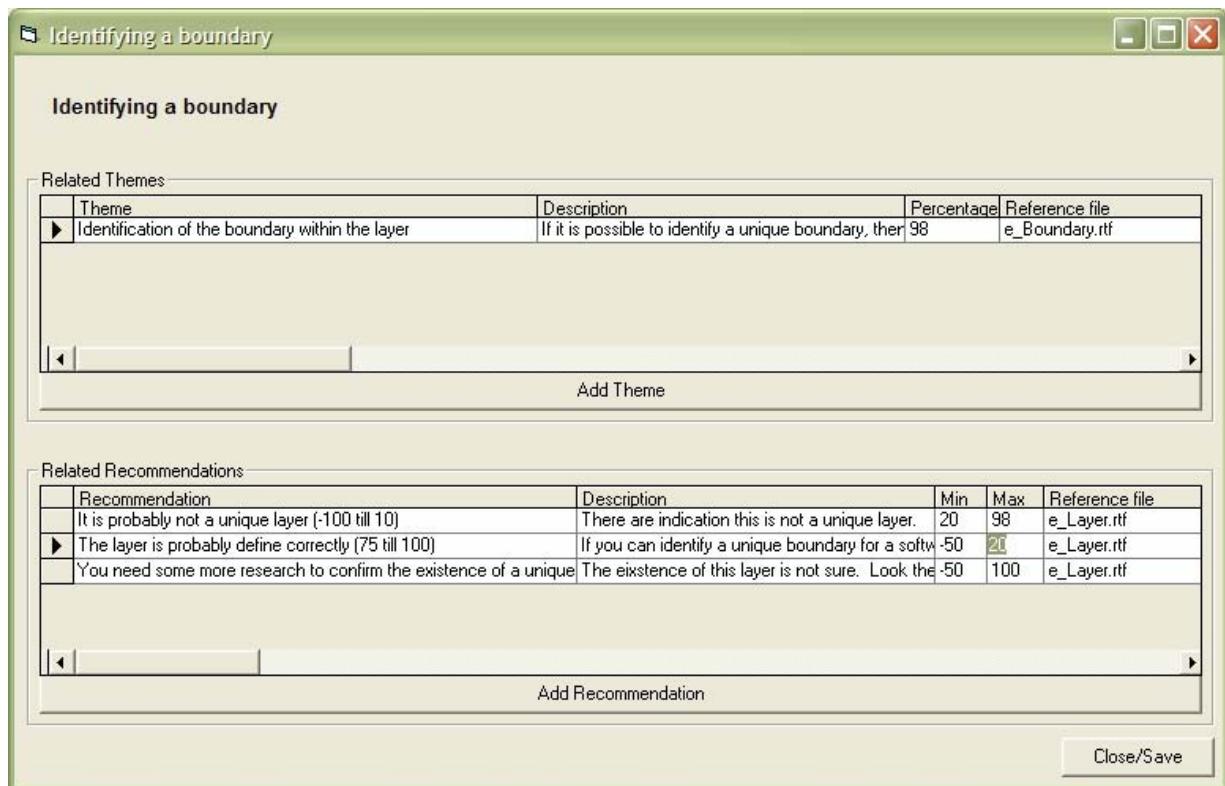
Figure 21: Properties of a Case Problem

Figure 21 is basically the same as Figure 20, with the difference that, from a hierarchical point of view, Case Problems have two different items beneath them: Themes and Recommendations.
Note: Case-specific knowledge has been entered in only one language up to now. Another interface is required to fully take care of the language issue.
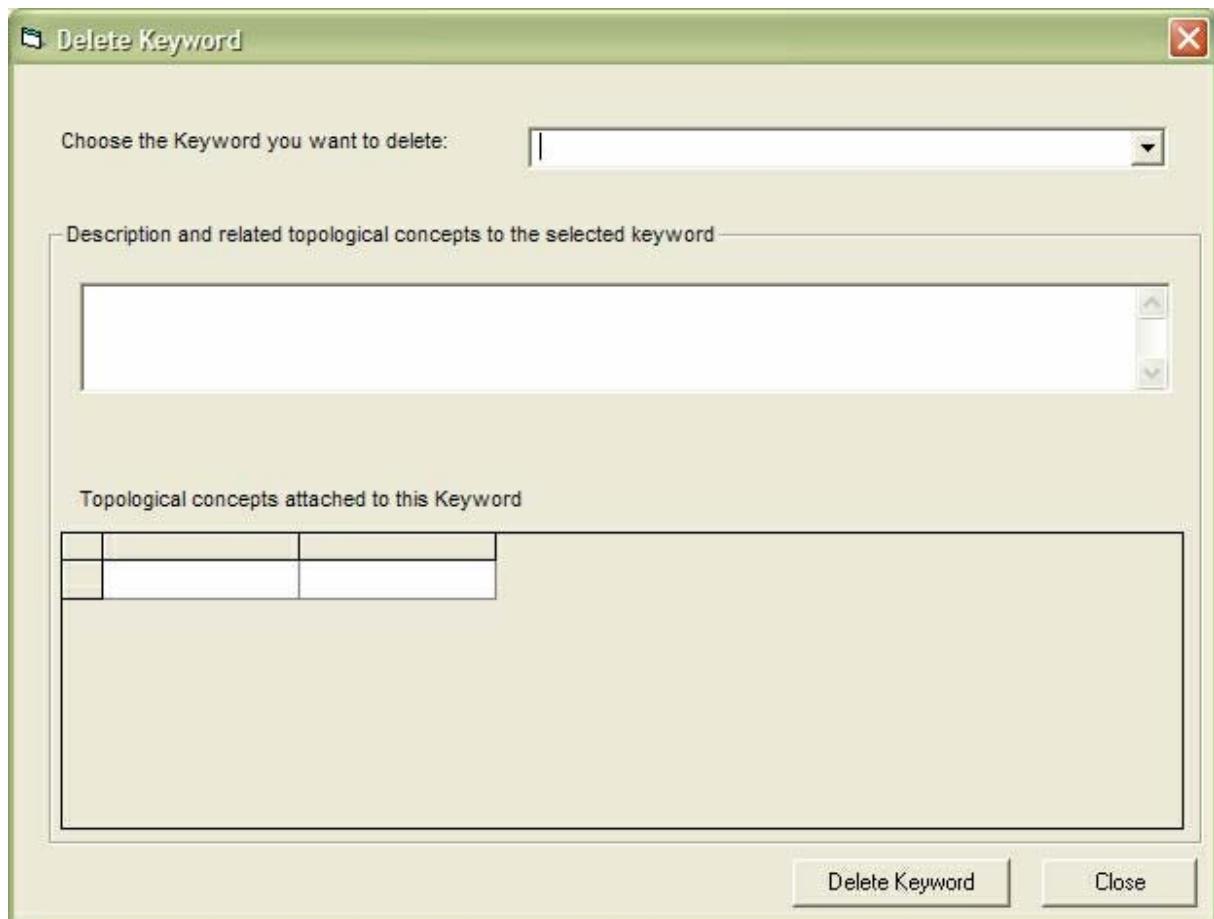
Figure 22: Deleting a Keyword

The desired Keyword is selected using the combo box at the top. Once this has been done, the Description and related TC box are populated automatically. On hitting the Delete button, the user will be asked if TCs related only to this particular Keyword are to be deleted as well. TCs related to any other Keyword will not be deleted in any case.

Figure 23: Maintaining case-specific knowledge

The title should be "Maintain Knowledge Base in all languages" or "Define knowledge to be maintained" in Figure 23.

Using the combo box at the top, the user decides what part of the expert knowledge (Keywords, TCs, CPs, Themes, Facts or Recommendations) is to be maintained. From there, the expert can translate each item8 name and description into the desired language. Its percentage is independent of the language, so that the Knowledge Base can be used interchangeably between different countries. Usability considerations led to the decision to have just one reference file per item, and each file contains text in all four languages. Translating a (large) reference text will be the final task for an expert to perform. So, to avoid having no reference whatsoever, it was felt that it might be better to at least have access to it in another language.

---

8 To look through the records, use the Browse records control key.
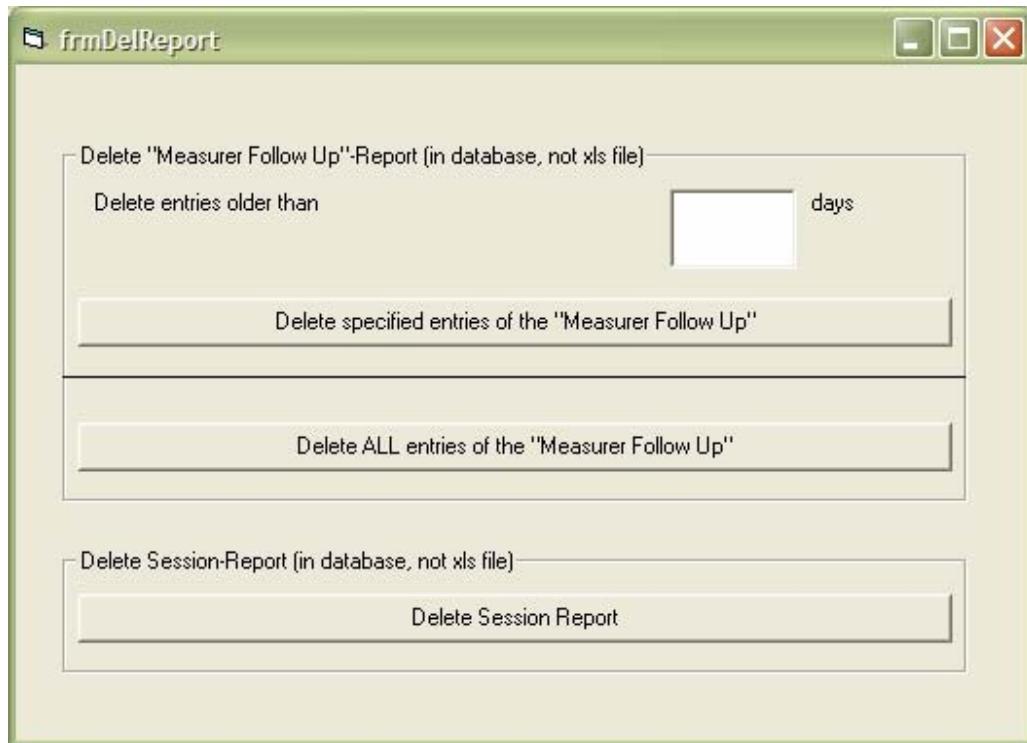
Figure 24: Managing Reports

The Reports menu in the Expert Interface allows the expert to receive measurer follow-up and session information. The object of Measurer Follow-up is to have a record of who searched for what Keywords, and their related Case Problems and Themes, in a session, as well as the Facts chosen, the quality of the documentation and the Recommendations calculated. The Session Report contains the username along with the session number and start and end dates.

To avoid the accumulation of huge tables which are difficult to read, an expert can delete these reports. They can either be deleted immediately or the user can specify that the Measurer Follow-Up be deleted after x days.

Administrator Mode
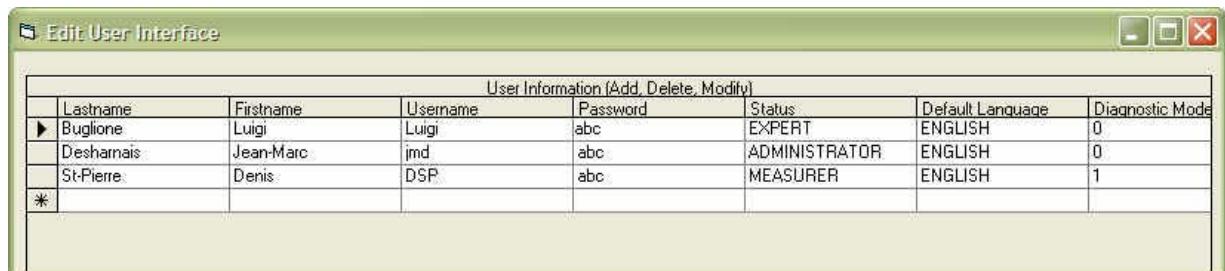
	Lastname	Firstname	Username	Password	Status	Default Language	Diagnostic Mode
▶	Buglione	Luigi	Luigi	abc	EXPERT	ENGLISH	0
	Desharnais	Jean-Marc	jmd	abc	ADMINISTRATOR	ENGLISH	0
	St-Pierre	Denis	DSP	abc	MEASURER	ENGLISH	1
✱							

Figure 25: Adding, deleting or modifying user information

This feature can be accessed only if the user status is that of administrator; otherwise the item appears disabled on the menu bar. With the help of Edit User Interface, a new user can be added, or an existing one deleted or modified, e.g. their status, expiry date, diagnostic model or first and last names. Usually, a user's username, password and default language are maintained by the user.

Annexe C: Description de l'environnement de développement du prototype 2

Développement du prototype 2

François Gruselin, Julien Vilz et Jean-Marc Desharnais
11 décembre, 2002

Développement

Page JSP

Pour développer le prototype nous avons choisi la technologie Java Server Page. Java Server Page (JSP) est une technologie qui a pour but de contrôler le contenu ou l'apparence d'une page Internet par l'utilisation de servlets. Les servlets sont de petits programmes qui sont décrits dans les pages Internet et qui s'exécutent sur le serveur Internet afin de modifier la page Internet avant de l'envoyer vers l'utilisateur qui la demandé. JSP est comparable à la technologie Active Server Page (ASP) de Microsoft. Une page JSP appelle un programme Java qui s'exécute sur la serveur.

Nous avons combiné JSP avec XSL décrit plus haut afin de produire les différentes vues de la base de connaissance et les fonctionnalités de l'outil de diagnostic.

La technologie JSP va nous permettre de transformer du côté du serveur les fichiers XML pour les visualiser. Nous avons voulu éviter de laisser ce travail au navigateur Internet car seule les dernières versions sont capables de le faire et certaine transformation impliquant plusieurs fichiers XML sont plus faciles à réaliser avec la combinaison de JSP et XSL qu'avec XSL tout seul.
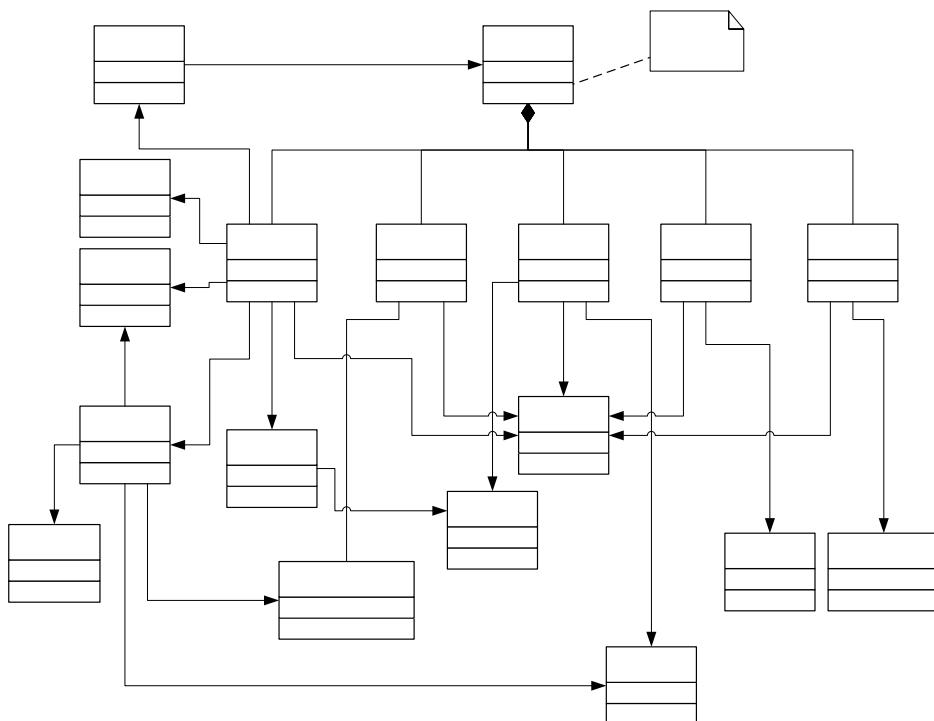
Figure 3 : Carte de CosmicXpert

La Figure 22 : Carte de CosmicXpertmontre les liens entre les pages JSP de l'application. Les lien *link* représentent un simple lien hypertexte entre les documents tandis que *post* et *get* représentent un passage d'information entre les pages via les méthode http post et get.

login.jsp

L'application commence par la page login.jsp, elle permet l'ouverture d'une session par l'entrée un login et un mot de passe.
Les pages JSP peuvent recevoir des informations en provenance d'autres pages ou du client grâce à la méthode post ou get.
La page login peut recevoir un attribut « fail » qui indique que l'ouverture de session à échoué.

«JSP page»
login

get

«HTML page»
help

measurer.jsp

Measurer.jsp reçoit le login et le mot de passe de la page login.jsp et vérifie l'existence de l'utilisateur. En cas d'échec elle renvoie le paramètre « fail » à la page de login sinon elle affiche les 5 pages qui constitue l'outil de diagnostic : kwSearch.jsp, searchTC.jsp, search.CP.jsp, listThemes.jst et answer.jsp.

kwSearch.jsp

La page kwSearch.jsp affiche le menu de l'application en fonction du type d'utilisateur (« admin » ou « measurer »).
C'est via cette page que l'utilisateur sélectionne un mot clé et peu visualiser les définitions des mots clés.

searchTC.jsp

La page searchTC.jsp est responsable d'afficher les résultats de la recherche des concepts topologiques associés au mot-clé dont l'identifiant est reçu en paramètre lors du chargement de la page.
L'utilisateur sélectionne un concept topologique parmi les résultats de la recherche.

searchCP.jsp

Le concept topologique sélectionné sur la page searchTC.jsp est passé en paramètre à la page searchCP.jsp. Cette dernière affiche tout les cas problème associés au concept topologique sélectionné.
L'utilisateur sélectionne un cas problème parmi les cas problème affichés.

listThemes.jsp

En fonction du concept topologique sélectionné, listThemes.jsp affiche une liste de thèmes ainsi que des listes de propositions pour y répondre.
L'utilisateur choisi un fait parmi les propositions pour chacun des thèmes.

answer.jsp

La page answer.jsp reçoit en paramètre les faits choisit par l'utilisateur sur la page listThemes.jsp. En fonction des faits, cas problème et concept topologique choisis, la page affiche une recommandation.

topologicalConcept.jsp

La page topologicalConcept.jsp reçoit en paramètre le chemin vers un fichier XML de type Concept topologique. Elle est responsable de le transformer et de l'afficher.
Un deuxième paramètre optionnel permet de d'indiquer à la page que l'utilisateur est un expert et qu'il désire voir tout le contenu du fichier.

caseProblem.jsp

CaseProblem.jsp a les mêmes fonctionnalités que la page topologicalConcept.jsp mais elle reçoit le chemin vers un fichier XML de type Cas problème.

caseStudy.jsp

La page caseStudy.jsp a comme responsabilité d'afficher les informations contenues dans les fichiers XML de type étude de cas.
Un paramètre permet d'afficher uniquement les contextes utilisés dans la description des cas problème affiché par la page caseProblem.jsp.

recommendation.jsp

La page recommendation.jsp reçoit le pourcentage calculé par la page answer.jsp en fonction des faits choisis. En fonction de ce pourcentage elle affiche le document de recommandation approprié. Les données proviennent du fichier XML du cas problème sélectionné.

themes.jsp

La page thèmes.jsp reçoit en paramètre l'identifiant d'un thème du concept topologique sélectionné. C'est ce thème que la page doit afficher.

glossary.jsp

La page glossary.jsp permet d'afficher la définition du mot clé dont elle reçoit l'identifiant en paramètre. Si elle ne reçoit pas de paramètre, elle affiche tous les mots clés avec leur définition.
Les mots clés proviennent du fichier glossary.xml

concept.jsp

La page concept.jsp a les mêmes fonctionnalités que glossaire.jsp mais les définitions et mots clés qu'elle affiche sont les concepts liés à l'application CosmicXpert et non les mots clés de la méthode de mesure.
Les concepts proviennent du fichier concept.xml.

xpert.jsp

A partir du fichier xpert.xml, la page xpert.jsp affiche un tableau reprenant les dépendance entre les concept topologique et les mots-clé ainsi que entre les concepts topologique et les cas problème.
Cette page contient l'accès aux rapports permettant la vérification et la validation de la base de connaissance.

testGenerator.jsp

La page testgenerator.jsp produit un rapport permettant la validation des recommandations. Elle fournit les résultats de toutes les combinaisons de réponses aux thèmes pour un cas problèmes et affiche la recommandation adéquate.
Cette page reçoit en paramètre le chemin vers le fichier XML du cas problème a tester.

cases.jsp

La page cases.jsp donne une liste de toutes les études de cas intégrées à la base de connaissance. Elle donne l'accès à l'ensemble des contextes liés aux études de cas et utilisés dans les différents documents de la base de connaissance (lien vers caseStudy.jsp). Ce rapport permet de valider le contenu de ces contextes.

XSL

Pour transformer les fichiers XML en HTML nous avons préférer le langage XSL à des méthodes en Java pour faciliter la maintenance. Nous pouvons en effet modifier l'apparence d'un document sans devoir recompiler l'application. La modification du ficiher XSL suffit.
Les pages JSP utilise les fichiers contenant les scripts XSL pour transformer les fichiers XML. Ce processus ce fait sur le serveur.
Vous trouverez ci-dessous un tableau reprenant tout les scripts XSL, leur objectif, les paramètres nécessaires ainsi que les pages JSP où ils sont utilisé.

XSL	XSD associé	Description	Paramètre	Utilisé dans
kwSearch.xsl	glossary.xsd	Crée à partir d'un glossaire une liste de choix de mots-clé		kwSearch.jsp
keyword.xsl	glossary.xsd	Affiche la définition et la référence d'in mot clé	kw: identifiant du mot clé à afficher	glossary.jsp, concept.jsp
glossary.xsl	glossary.xsd	Affiche l'entièreté du glossaire		glossary.jsp, concept.jsp
resultTC.xsl	xpert.xsd, tc.xsd	Crée un tableau affichant les concepts topologique associés au mot-clé.	kw: identifiant du mot clé pour lequel on cherche des concepts topologique	searchTC.jsp
tc.xsl	tc.xsd	Affiche un concept topologique pour l'utilisateur		topologicalConcept.jsp
tcXpert.xsl	tc.xsd	Affiche un concept topologique pour un expert (affiche en plus tout les thèmes et les pourcentages)		topologicalConcept.jsp
resultCP.xsl	xpert.xsd, cp.xsd	Crée un tableau affichant les cas problème associés au concept topologique.	TC: le chemin vers le fichier du concept topologique choisi	searchCP.jsp
cp.xsl	cp.xsd	Affiche un cas problème pour l'utilisateur		caseProblem.jsp
cpXpert.xsl	cp.xsd	Affiche un cas problème pour un expert (affiche en plus tout les recommandations et leurs pourcentages)		caseProblem.jsp
case.xsl	cs.xsd	Affiche le résumé d'une étude de cas		caseStudy.jsp
cases.xsl	cs.xsd	Affiche tout les contexts utilisés dans les cas problème pour une étude de cas		caseStudy.jsp
listTheme.xsl	tc.xsd	Affiche un tableau contenant les thèmes et des listes de sélection de faits pour chaque thème		listThemes.jsp
th.xsl	tc.xsd	Affiche les informations concernant un thème	TH: l'identifiant du thème à afficher	theme.jsp
cpTh.xsl	cp.xsd	Affiche l'explication du cas problème		theme.jsp
answer.xsl	cp.xsd	Affiche la réponse et un lien vers la recommandation en fonction du pourcentage calculé à partir des réponse aux thèmes	cf: pourcentage calculé à partir des réponse aux thèmes	answer.jsp

rec.xsl	cp.xsd	Affiche le document de recommandation en fonction du pourcentage	cf: pourcentage calculé à partir des réponse aux thèmes	recommendation.jsp
xpert.xsl	xpert.xsd			
recTest.xsl	cp.xsd	Affiche la recommandation pour le test en fonction du pourcentage à tester	cf: pourcentage calculé à partir des réponse aux thèmes	testGenerator.jsp
cpTest.xsl	cp.xsd	Affiche les informations nécessaire au test concernant un cas problème		testGenerator.jsp

Annexe D: Procédure de vérification de la base de connaissances du prototype 1

Procédure de vérification de la base de connaissance du prototype 1

Vérifier le contenu des documents de référence pour les mots clefs et les concepts topologiques. S'assurer que pour les concepts topologiques on respecte le gabarit. Vous aurez une idée du gabarit en regardant comment la plupart des concepts topologiques sont décrits.

Faire une vérification par cas problème. S'assurer que tous les cas problèmes sont vérifiés. À cet effet voir le document suivant:

Case problems (by file name)	Keywords
ecp_Application program interface.rtf	Application program interface
ecp_Boundary Rice Cooker.rtf	Boundary
ecp_Characteristics of a Triggering Event.rtf (How to…)	Triggering event
ecp_Clock signal RC.rtf	Triggering event
ecp_Control Heater RC.rtf	Functional process
ecp_Control Indicator Lamps RC.rtf	Functional process
ecp_Cooking Mode.rtf	Data group
ecp_creating a report RG.rtf	Triggering event
ecp_Elapsed Time.rtf	Data group
ecp_End user layer RG.rtf	Layer
ecp_Entry.rtf (How to identify an Entry)	Entry, sub processes
ecp_Exit.rtf (How to identify an Exit)	Exit, sub processes
ecp_Generate a report RG.rtf	Functional process
ecp_Generator layer RG.rtf	Layer
ecp_List of parameters RG.rtf	Functional process
ecp_Mode Switch.rtf	Entry
ecp_parameters RG.rtf	Data group
ecp_Read cooking mode.rtf	Read
ecp_Read target temperature.rtf	Read
ecp_Read.rtf (How to identify a read)	Read, sub processes
ecp_Receive elapsed time.rtf	Entry
ecp_Receive triggering event.rtf	Entry
ecp_Set Cooking Mode RC.rtf	Functional process
ecp_Set heater on-off.rtf	Exit
ecp_Set status to lamp.rtf	Exit
ecp_Set Target Temperature RC.rtf	Functional process
ecp_Software users.rtf	User
ecp_Status.rtf	Data group
ecp_Temperature.rtf	Data group
ecp_Triggering event user press a switch RC.rtf	Triggering event
ecp_Write mode RC.rtf	Write
ecp_Write temperature RC.rtf	Write
ecp_Write.rtf (How to identify a write)	Write, sub processes

ecp_X seconds Clock Signal.rtf   Data group

Pour chaque document de référence i.e. cas problème, thème, événement, recommandation:
vérifier l'écriture du texte (ex: typos et syntaxe)
s'il suit le gabarit
si le contenu est conforme à ce qui est attendu

Il faut aussi, pour chaque concept, vérifier les pourcentages (principalement les recommandations).
Voir aussi s'il ne manque pas de cas problèmes (ex: cas problème, comment identifier un processus fonctionnel) ou encore des thèmes (maximum de 4 normalement. S'il y a plusieurs exceptions notables on pourra passer à 5 thèmes).
Est-ce que la documentation du cas (ex: Rice Cooker et Report Generator) est claire. Sinon, quelles améliorations suggérez-vous?

Annexe E: Curriculum des experts pour le prototype 1

Denis St-Pierre

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Denis St-Pierre est un consultant senior en amélioration de processus et mesures. Il a fait de la consultation de 1986 à ce jour dans le domaine de l'amélioration des processus (CMM) de la mesure fonctionnelle (FPA et COSMIC-FFP) auprès de corporations nord américaines, asiatiques et européennes. Il a réalisé un grand nombre de projets d'amélioration de processus de mesures. Il a, dans les années 1990, contribué significativement à la norme IFPUG. À partir du milieu des années 1990 il a participé à la création de FFP (Full Function Point), devenue la norme COSMIC-FFP en 2002 (ISO 17961) Il est co-auteur de la méthode de mesure fonctionnelle COSMIC-FFP. Il a réalisé des contrats de mesures fonctionnelles dans le cadre de contrat d'impartition dans plusieurs grandes entreprises. Voici quelques clients de Denis St-Pierre pour la mesure fonctionnelle, l'implantation de programmes de mesures et l'amélioration des processus: Alstom, Bombardier, CGI, Commonwealth Bank of Australia, DMR, EDS, Gouvernement du Québec, Gouvernement du Canada, Hydro Québec, Hewlett Packard, IBM, KPMG, Nissan, Nortel, Sunlife, Telecom (Nouvelle-Zélande) et Telstra (Australie).

Il a aussi participé à plusieurs projets de recherches avec l'UQAM et publié plusieurs articles scientifiques que vous pouvez consulter sur le site du LRGL.

Scolarité

1988   Maîtrise en informatique, Université de Sherbrooke,
Sujet de maîtrise: mesure de logiciels
1986   Baccalauréat Coopératif en informatique, Université de Sherbrooke
1983   Certificat en administration, Université du Québec à Trois-Rivières
1982   DEC en administration

Présentation de Francis Dion

Monsieur Françis Dion est un gestionnaire de projet senior ayant 14 années d'expériences en développement de logiciel et amélioration des processus. Ses talents de gestionnaire et son leadership lui permettent de livrer les projets à temps, dans le respect des budgets et avec un haut degré de qualité.

Il possède une connaissance approfondie des meilleures pratiques de l'industrie, notamment le Rational Unified Process (RUP), le Unified Modeling Language (UML) le Microsoft Solution Framework (MSF) et le Capability Maturity Model – Integrated (CMMI). En tant que spécialiste des processus logiciels et des mesures, il a présenté deux articles à la « International Workshop on Software Measurement ». Il a également contribué au « Guide to the Software Engineering Body of Knowledge » (un projet de la IEEE – Computer Society) et au développement de la méthode Cosmic-FFP (mesure de la taille fonctionnelle).

Sa maîtrise du processus de développement et sa compréhension des défis techniques impliqués l'amènent à anticiper les difficultés et à prendre au moment opportun les mesures qui s'imposent. Ses talents de leader, de mentor et de motivateur en font un guide efficace et respecté par les équipes qu'il dirige. Une éthique de travail exceptionnelle et un engagement infaillible envers le client et l'utilisateur final lui permettent de systématiquement livrer à temps un produit rencontrant les attentes de toutes les parties impliquées.

Présentation de HASSAN DIAB
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Research assistant, Teacher, and metrics specialist. Experience in research and development of software: software measure, analysis and design, relational database modelling and design, development methodologies, review and testing, participating in international conferences, and publishing papers/technical reports in software metrics.

PROFESSIONAL EXPERIENCES

- **Research Assistant**

  1996 - 2003

Sherbrooke University, Sherbrooke, Qc, Canada

♦ Define a theoretical framework for measuring software functional size from Rational Rose RealTime (RRRT) specifications

Work in collaboration with CGI and Bell-Sygma companies to define a formal approach for measuring software size from specification written in the B language

♦ Write and publish papers and technical reports treating issues about software measurement
♦ Participate in international conferences and workshops about software metrics
♦ Review and evaluate papers for publishing purposes in *Computer Society*
♦ Identify functional users requirements, design and develop a tool (called *McRose*) measuring the functional software size from RRRT specifications
♦ Define/execute testing scenarios and debug programs in order to validate the correctness of *McRose*

RELATED EXPERIENCES

o *Teacher*

1996 - 2003

Sherbrooke University, Sherbrooke, Qc, Canada

♦ Teach courses in software engineering, database, artificial intelligence, software metrics, management of software development, and programming language
♦ Prepare exams, assignments, and solutions

EDUCATION

Ph.D. in Software engineering   (in progress)   2003

Sherbrooke University, Sherbrooke, Qc, Canada

    M.sc. in Software engineering   1999
    B.sc. in Computer Science   1996

``Conservatoire National des Arts et Métiers (CNAM)´´ France

M. HO Tuong Vinh
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POSITION ACTUELLE
Professeur d'informatique à l'Institut de la Francophonie pour l'Informatique de Hanoi
(Vietnam): Octobre 2000 – présent
Domaine de recherche : Génie logiciel, Gestion de logiciels, Processus logiciel
ÉDUCATION
Ph.D. en Génie Électrique (Génie informatique) : Janvier 1995- Janvier 1999
      École Polytechnique de Montréal, Canada
M.Sc. (Maître ès sciences) (Génie informatique) : Septembre 1991 - Août 1994
        Université du Québec à Chicoutimi (UQAC), Canada
Baccalauréat en Génie électrique : Août 1981 – Juin 1986
        École Polytechnique de Hanoi, Vietnam
        Département de génie électrique
INTÉRÊTS DE RECHERCHE
Génie logiciel, Gestion de logiciels, Processus logiciel
Réseaux de neurones
Reconnaissance des formes, Reconnaissance de la parole
EXPÉRIENCES PROFESSIONELLES
Chercheur post-doctoral au Laboratoire de recherche en gestion de logiciels, Université
du Québec à Montréal : Octobre 1998 – Septembre 2000
Domaine de recherche: Génie logiciel, Gestion de logiciels, Processus logiciel
La méthode de mesure de la taille fonctionnelle de logiciels COSMIC-FFP : implication
dans l'élaboration de plusieurs études de cas, la révision du manuel, l'application et la
formation
Consultant pour Alcyonix Inc. (Canada) dans un projet dont l'objectif est d'évaluer la
maturité du processus logiciel (selon le modèle Capability Maturity Model) des sous-
traitants de logiciels pour le compte de Bombardier Inc. (Canada)
EXPERTISE TECHNIQUE
Méthodologies de génie logiciel, gestion de logiciels, mesures de taille fonctionnelle
(IFPUG, COSMIC-FFP)
Langages de programmation : C, C++, Java, Pascal, Fortran, Modula
Technologies d'objets orientés
Modélisation de logiciels pour UNIX, WINDOWS, stations SUN, et PCs

Annexe F: Liste des associations internationales: mesure fonctionnelle

Voici la liste des associations de mesures à travers le monde qui font la promotion des points de fonction:

ASMA (Australia; Autralian Software Metrics Users Association)
BFPUG (Brazilian Function Point Users Group)
CIM (Canada)
DANMET (Denmark)
DASMA (Germany; Deutsche Anwendergruppe für Software Metrik und Aufwandschätzung)
FFPUG (France; French Function Point Users Group)
FiSMA (Finland; Finnish Software Metrics Association FiSMA)
FPUGA (Austria; Function Point Users Group Austria)
GUFPI (Italy)
IFPUG (United States; International Function Point Users Group)
ISBSG (International Software Benchmarking Standards Group Ltd)
ITB (Platform van **IT**-**B**eroeps- en vakverenigingen in Nederland)
JFPUG (Japan; Japanese Function Point Users Group)
NESMA (Netherlands; Netherlands Software Metrics Users Association)
SASMA (South Africa; South African Software Metrics Association)
UKSMA (United Kingdom; United Kingdom Software Metrics Association)

Annexe G: Exemples de "règles locales"

- B.1 Introduction

- B.1.1 Objective of this document

Present a cohesive set of local rules on how to apply COSMIC 2.1.

- B.1.2 Reasoning behind the Local Rules

FFP is a measure standardized by the international organization COSMIC. While most counting rules are described in the COSMIC FFP measurement manual, some rules must be clarified to determine how to apply them. In some cases, local rules make the counting process more efficient.

- B.1.3 Target Audience

This document is targeted to measurement specialists that already have some training and COSMIC FFP experience. It is structured as a reference book, so it is intended to be used as such rather than a training material. Use the table of contents and the index to locate a specific counting issue.

- B.1.4 How to find your way in this document

This document presents measurement issues grouped by topics (e.g. boundaries, layers, group of data). The table of contents and the index can be used to find a specific detailed topic. if you read this document on screen rather than on paper, you can search for a topic using the "Find" function of Microsoft Word. If you do this be aware that specific topic titles are followed by "&" in hidden (e.g. trigger &) characters in order to facilitate searching. Also, navigation can be facilitated by using the hypertext links.

In this document, extracts from the COSMIC FFP manual are identified in italic characters.

B.2 General Rules

- B.2.1 Purpose of the count

The purpose of the count is the reason why the count is done. For example, it can be to estimate the cost of a project, or to size an existing application. These are the two main count purposes: Estimation and

Application. You will find in this document different ways of applying FFP local rules for Estimation counts and Application counts. For example, section 2.6 is about Boundaries and Scope of Estimation counts and section 2.7 is about Boundaries and Scope of Application counts.

B.2.2 Boundary

Boundary definition:

"The boundary of a piece of software is the conceptual frontier between this piece and the environment in which it operates, as it is perceived externally from the perspective of its users. The boundary allows the measurer to distinguish, without ambiguity, what is included inside the measured software from what is part of the measured software's operating environment." COSMIC FFP v2.1 Measurement Manual.

B.3 COSMIC-FFP Processes
Here is the definition of a COSMIC-FFP Process:

"A functional process is a unique and ordered set of data movements (entry, exit, read, write) implementing a cohesive set of Functional User Requirements. It is triggered by an event and, once performed, must leave the software in a coherent state with respect to the triggering event." COSMIC FFP v2.1 Measurement Manual

Here are additional guidelines to identify FFP process:

On completion of the FFP process the user can exit the application without corrupting their data or leaving their business process incomplete.

The transaction achieves a "business goal" and often have an equivalent in a manual system.

The transaction does not exist for technical or implementation reason.

The transaction completes a single unit of work.

The transaction can be triggered and complete its processing independently, that is, it does not have a direct synchronous link to other functions.

Subset processes are not process on their own. Here are examples of subset processes:

Report which can optionally print or hide fields.

A single transaction which can operate in multiple ways (e.g.: depending on the contents of fields, other fields become optional or mandatory).

An inquiry with multiple selection criteria.

Hint: Sequences of events which end with an "OK" button to save or output data (not "OK" to move to another windows only) are often FFP processes.

Note on FFP processes: take care not to decompose the functionality beyond the lowest level. For example, the level of calculating individual field, is too low. On the other hand, take care not to decompose enough. For example, Manage New Employee must be decomposed if there are different types of activity: Create a new employee, Change an employee, Delete an employee.

Trigger &: (note: italic text is text extracted from the official FFP Measurement Manual)

Triggering event (-type): A triggering event occurs outside the boundary of the measured software and initiates one or more functional processes. Clock and timing events can be triggering events. Since each identified layer is separated by a boundary, triggering events can occur in one layer and initiate functional processes belonging to another layer.

Functional process (-type) (Synonym 'Transaction-type'): A functional process is a unique set of data movements (entry, exit, read, write) implementing a cohesive and logically indivisible set of Functional User Requirements. It is **triggered directly, or indirectly via** an 'actor', by an Event (-type) and is complete when it has executed all that is required to be done in response to the triggering Event (-type).

Functional process principles

a) *A functional process is derived from at least one identifiable Functional User Requirement,*
b) *A functional process is performed when an identifiable **triggering event** occurs,*
c) *A functional process contains at least two data movements, an entry and an exit or a write,*
d) *A functional process contains no more than one self-induced wait state (which may occur when it is completed),*
e) *A functional process belongs to one, and only one, layer.*

Boundary rule

Start by identifying triggering events, then identify the functional processes enabled by those events. The boundary lies between the triggering events and those functions.

Functional process rules

Subsets of triggering events are not considered different triggering events.

> *For instance, if a specific event occurrence triggers the entry of a data group comprising data attributes A, B and C, and then another occurrence of the same event-type, triggers an entry of a data group which has values for attributes A and B only, this is not considered a different triggering event-type. It is considered to be the same for the purpose of identifying COSMIC-FFP functional processes. Consequently, only one entry and one functional process are identified, manipulating data attributes A, B and C.*
> *In the context of real-time software, a functional process is also triggered by an event. It terminates when a point of asynchronous timing is reached. A point of asynchronous timing is reached when, in a sequence of data movements, a given data movement is not synchronized with the one preceding it. A point of asynchronous timing is equivalent to a self induced wait state.*

Entry rules

Clock-triggered events are considered external. Therefore, an event occurring every 3 seconds is associated with an ENTRY moving one data attribute, for instance. However, the functional process that generates the event periodically is ignored since it occurs, by definition, outside of the software boundary.

Minor variations do not justify different FFP processes, even if they have different external triggers. As a variation of the previous example, if there are separate menu items for creating Permanent Employees and Temporary Employees, then there is still only one process.

Polling

In some circumstances we can contrive that the events of interest in the external world directly generate messages which form the input side of a logical transaction. In other circumstances, a software application must periodically inspect (c'est-à-dire "poll") the status of the external world to determine whether an event of interest has occurred, generating an input message to document a positive result. In either case, the resulting message is regarded as Entry (the detection mechanism is purely implementation detail). The polling mechanism is, of course, triggered by an event in the external world i.e. the passage of a specified amount of time.

Annexe H: Études de cas

Ces études de cas sont disponibles sur le site du LRGL à l'UQAM.
H.1 Data Warehouse
http://www.lrgl.uqam.ca/cosmic-ffp/casestudies/
H.2 Rice Cooker
http://www.lrgl.uqam.ca/cosmic-ffp/casestudies/
H.3 Valve Control
http://www.lrgl.uqam.ca/cosmic-ffp/casestudies/
H.4 Générateur de rapport
(Voir texte ci-joint)

F.4 Report/Query Generator

Application profile

The Report or Query Generator application is designed to produce reports. The actual example is generic, not specific to a particular Report or Query Generator. Its specifications are presented in the appendix.

· General information about the application to be measured

Application domain: Infrastructure

Application type: MIS

· Available information about the application

Document: Specifications document

IDENTIFY COSMIC-FFP SOFTWARE FUNCTIONAL USER REQUIREMENT

BOUNDARY

User

Human

Layer

It is possible to identify two layers: the end user layer and the report generator layer.

Boundary

Based on the specification, we can identify the application boundary (Figure 1). The Report Generator application gets the capability to define and create their own types of report or query from the end user using parameters (group of data) as Entry, types[9] of report and query as Processes and Error messages and List of parameters as Exit . It sends information to the software to produce reports.

---

[9] It is types of reports because our intention is not to count all the potential reports or queries, but the types of report and query the user can produce, using the functionality of the Report/Query Generator.
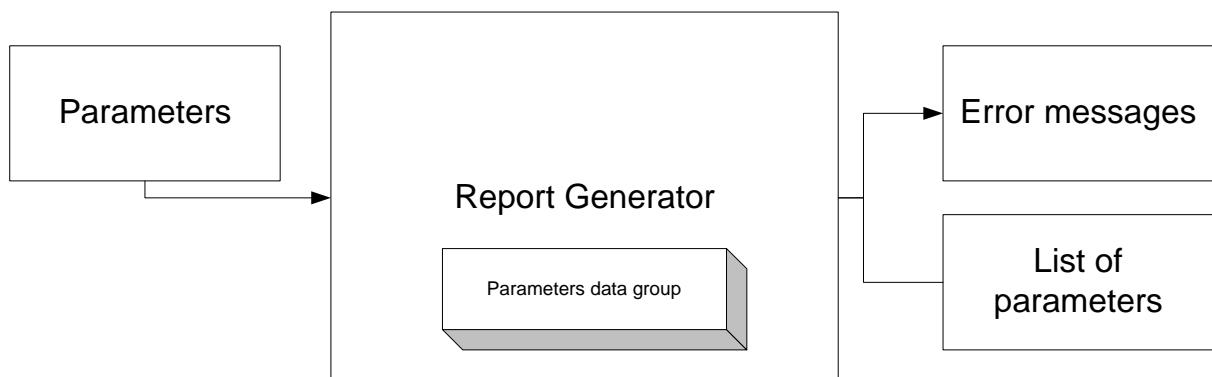
Figure 4 Report Generator

IDENTIFY CANDIDATE COSMIC-FFP TRIGGERING EVENTS, FUNCTIONAL PROCESSES AND DATA GROUPS

At this step, we will identify functional processes (from the user's point of view) that can be considered as candidates for COSMIC-FFP functional processes. Candidate triggering events and data groups will be also identified.

Identify Candidate Triggering Events

From the requirements the following triggering events was identified:

Select the parameters
Ask for a list

Identify Candidate Functional Processes

From the requirements the following functional processes are identified:
Generate a report: As indicated in the requirement each report layout (bar graph, pie chart, and line graph) should be measured as separate FFP process.
Generate a query: As indicated in the requirement each query layout (bar graph, pie chart, and line graph) should be measured like the reports.

List of parameters: As indicated in the requirement, the user can produce[10] a list of parameters available in de database.

Error messages: As indicated in the requirement, if the user makes a mistake, an error message appears.

Identify Candidate Data Group

From the requirements the following data group was identified:
parameters

MAP IDENTIFIED CANDIDATE ITEMS INTO COSMIC-FFP SOFTWARE MODEL

Based on COSMIC-FFP rules the candidate items (i.e. functional processes, triggering events and data groups) are mapped into the COSMIC-FFP software model. The mapping phase must associate each functional process to a triggering event and data group manipulated by it. This phase allows also identifying layers in the context of the COSMIC-FFP software model.

The mapping phase will be performed through a procedure. The procedure also allows assessing if a candidate functional process is a COSMIC-FFP one. Each candidate process must satisfy the following questions in order to be validated as a COSMIC-FFP functional process:

Does it operate on a unique and ordered set of data movements performing a set of FURs?
Is it triggered by an event (triggering event) ?
Does the triggering event occur outside the boundary of the software?
In the following we will assess each identified candidate process.

Generate a report: As indicated in the requirement each report layout (bar graph, pie chart, and line graph) should be measured as separate FFP process.

Does it operate on a unique and ordered set of data movements performing a set of FURs? Yes, the user enter parameters that are process by the software to create a report layout

Is it triggered by an event (triggering event)? Yes, the human user.

Does the triggering event occur outside the boundary of the software? Yes (outside the boundary of the software)

Generate a report is then a COSMIC-FFP functional process.

Generate a query: As indicated in the requirement each query layout (bar graph, pie chart, and line graph) should be measured like the reports.

Does it operate on a unique and ordered set of data movements performing a set of FURs? No, the user enters parameters that are process by the software to create a query layout which is already done the same characteristics based on the requirements.

---

10 The case study could be more complex if we add the possibility to the user to maintain the parameters. For the moment we prefer to keep the case study as simple as possible.

Is it triggered by an event (triggering event)? Yes, the human user.
Does the triggering event occur outside the boundary of the software? Yes (outside the boundary of the software)
Generate a query is then not a COSMIC-FFP functional process, because it is not unique.
List of parameters: As indicated in the requirement, the user can produce11 a list of parameters available in de database.
Does it operate on a unique and ordered set of data movements performing a set of FURs? Yes, the user asks for a list of parameters that is produce by the software.
Is it triggered by an event (triggering event)? Yes, the human user.
Does the triggering event occur outside the boundary of the software? Yes (outside the boundary of the software)
Generate a list of parameters is then a COSMIC-FFP functional process
Error messages: As indicated in the requirement, if the user makes a mistake, an error message appears.
Does it operate on a unique and ordered set of data movements performing a set of FURs? Yes, to produce an error message.
Is it triggered by an event (triggering event)? Yes, by the software.
Does the triggering event occur outside the boundary of the software? No (inside the boundary by the software itself)
Generate a query is then not a COSMIC-FFP functional process, because it is not triggered by an event outside the boundary of the software.

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11 The case study could be more complex if we add the possibility to the user to maintain the parameters. For the moment we prefer to keep the case study as simple as possible.

IDENTIFY COSMIC-FFP FUNCTIONAL SUB-PROCESSES AND APPLY COSMIC-FFP MEASUREMENT FUNCTION

For each identified functional process, we identify Cosmic-FFP functional sub-processes within it. Details of the identified sub-processes are presented in Table 1.

We use a convention for indexing functional processes: each functional process is assigned an ID number as in the following format: x.y where x is the layer number and y is the ID number of the functional process within the layer.

There are two functional processes: generate a report type (query[12]), list of parameters.

No	ID Process	Description	Trigger	Sub-process description	Sub-process type	Data Group	FFP
1	1.1	Generate a report/query	Select a parameter	Entry of parameters	E	Parameters	1
				Read parameters	R	Parameters	1
				Produce a report type	X	Parameters	
				Error messages	X		1
2	1.2	List of parameters	Ask for a list	Ask list	E		1
				Read parameters	R	Parameters	1
				Produce a list of parameters	W	Parameters	1
				Error messages	X		1

Total COSMIC-FFP Points: 8

---

12 Report and query are similar process; therefore it is necessary to measure only one of them or combine them as one process.

Report Generator or Query Generator Description

A Report Generator provides business users with the capability to define and create their own displays or reports using data fields which are currently available from existing FFP groups of data. Parameters are designed, developed and delivered so that a user can select
the fields (and their source) to be displayed/printed,
the criteria for their selection,
the format in which they will be displayed,
other rules for their display.

Note: Report or Query Generator does not include pre-defined queries or reports.
The user of the Report Generator can also produce a list of parameters available.

       End user layer:

End user layer's perspective is the whole set of delivered functionality, therefore functions (reports and queries[13]) produced by the users should be counted as long as the query and report parameters are saved and reused.

       Generator layer:

Measure the Generator Functionality.

Boundary

Report Generators may be a separate application which operates as a "utility" or "tool". They may also be functions within the boundary of another application. In that case, the application boundary may include both "local functionality" and the functionality of the generator.

Group of Data

Query or Report Generators reference data from other applications (potential FFP group of data). Generators also maintain parameters and rules selected and entered by the user. These are also FFP groups of data, e.g.: Report Format Files and Selection Criteria Files.

There may be instances of other logical groups of data that can be maintained/read by processes available via the Generator. If they deliver functionality and are maintained or

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13 In addition to created queries and reports, read entities must be considered FFP groups of data as well as maintained entities used to save parameters to generate queries and reports.

read by the Generator, they can be considered to be FFP groups of data. An example would be a maintained list of authorized users of the report facilities.

FFP Processes

Generator parameter and rules inputs
If a function allows the user to enter and save parameters then it is a potential FFP process.

Each report layout (bar graph, pie chart, line graph) is counted as separate FFP process. In our example we assume only one report layer. The user can also produce a query layout with the same characteristics.
If there are mistakes in the process, error messages appear.

Annexe I: Formules du prototype 1

Dans le prototype 1, codé en Visual Basic de Microsoft (version 6.0), on retrouve un ensemble de formules qui sont résumées dans le trois prochaines pages en pseudo code.

Followed, pseudo code examples are written down, performing tasks from the "Path of the measurer" (**Erreur ! Source du renvoi introuvable.**),
- Searching a Topological Concept
- Giving priority to Topological Concepts
- Finding Case Problems
- Giving priority to Case Problems
- Showing Themes
- Interpreting the answer

1. NewSearch_click()
Disable button
Connect to database
Retrieve kw_id from selected keyword

IF keyword exist THEN

      IF former search has been done THEN

          Call procedure MeasurerFollowup

     Else save kw_id
     Reset table attributes to default values;
       show to yes in Topology, Problem_gen, Question_gen, Recommendation_gen;
       calculated to no in Recommendation_gen; user_answ = no, qual_doc = 100 in
       Question_gen; selected = no in choice_gen
     Filldatagrids
     FormerSearch = True
Else Error message
Enable button

2. Filldatagrid()
If recordsets are open Then
     Close recordsets and release space
Retrieve appropriate cases from database
  Topological concepts: linked with the selected keyword, show = yes, lang_id = current
    language, topology != not translated into this language
  Case Problems: problems who belong to TC which are related to the selected keyword,
    lang_id = current language, show = yes
  Themes: Themes where TC_ID is related to the selected keyword, show = yes, lang_id
    = current language
  Recommendations whoms TC_ID are linked with the chosen keyword, show = yes,
    calculated = yes, lang_id is the current

Formatdatagrids

3. MeasurerFollowUp()

Initialise database
If Former Search has been done Then
    save former KW_ID for Report
If user hit exit button Then
    save new kw_id
If FormerSearch has been done Then
    Insert the following useractivities into SUBSESSION: userid, session id, keyword id
    Insert into table ANSWER the attributes user id, session id, keyword id, tc id, p id,
    q_id, a_id, qual_doc, relationship percentage between Theme and Fact
    Insert into Results relavant data about the calculation, user id, session id, kw id, tc id,
    p id, r id, probability.
Close database connection

4. Initialisedatabaseconnection(connectionstring)
If connection is already open
    Do nothing
Else set global object as new connetion
    set cursortype to "useclient"
    open database with connectionstring (udl file)

5. Closedatabaseconnection
If connection to database is open Then
    close connection and release space for the connection object

6. Formatdatagrids
Set width of the datagrid columns to the desired size and hide unwanted columns which
are necessary for update reasons

7. calculateRecom (ByVal p_id as integer)
connect to database
store information (p_id, a_id, q_chioce_perc, qual_doc) of the concerned case problem in
a recordset
Select Case "number of Themes already answered for this Case Problem"
Case 1 – $CF(CP) = CF(Theme1) = qual\_doc*q\_choice\_perc*P\_Q\_perc$
Case 2 – $CF(CP) = CF(Theme1)*CF(Theme2)$
Case 3 – $CF1(Theme) = CFcombine[CF(Theme1, CF(Theme2)]$
            $CF(CP) = CFcombine[CF1(Theme), CF(Theme3)]$
Case 4 - $CF1(Theme) = CFcombine[CF(Theme1, CF(Theme2)]$

$$CF2(Theme) = CFcombine[CF(Theme3, CF(Theme4)]$$
$$CF(CP) = CFcombine[CF1(Theme), CF2(Theme)]$$
Reset former calculations by setting calculated = 0 where P-ID is recent one
Set calculated = -1 and probability = CF(CP) of current P_ID
Requery Recommendations
Rebind Recommendations datagrid
Close recordsets and release space

Annexe J: Analyses statistiques

Univariate Analysis of Variance

Between-Subjects Factors

		N
EXP	1	14
	2	11
PROTO	Non	12
	Oui	13

Descriptive Statistics

Dependent Variable: BONS

EXP	PROTO	Mean	Std. Deviation	N
1	Non	24.00	12.64	7
	Oui	48.43	12.92	7
	Total	36.21	17.65	14
2	Non	33.60	9.71	5
	Oui	33.67	13.43	6
	Total	33.64	11.31	11
Total	Non	28.00	12.08	12
	Oui	41.62	14.74	13
	Total	35.08	14.96	25

Tests of Between-Subjects Effects

Dependent Variable: BONS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Eta Squared
Corrected Model	2129.592[a]	3	709.864	4.603	.013	.397
Intercept	29913.135	1	29913.135	193.986	.000	.902
EXP	40.843	1	40.843	.265	.612	.012
PROTO	919.734	1	919.734	5.964	.024	.221
EXP * PROTO	909.748	1	909.748	5.900	.024	.219
Error	3238.248	21	154.202			
Total	36133.000	25				
Corrected Total	5367.840	24				

a. R Squared = .397 (Adjusted R Squared = .311)

Interprétation: Pour les <u>bonnes réponses</u>, la valeur de F pour la relation entre les groupes et l'utilisation ou pas du prototype est de $F_{(1,21)}= 5,900$ avec p= 0,024, soit inférieure à 0,05. La p-valeur se trouvant en dessous de 0,05, le résultat confirme que les deux groupes de l'expérimentation sont différents et non additifs (H_1).

Univariate Analysis of Variance

Between-Subjects Factors

		N
EXP	1	14
	2	11
PROTO	Non	12
	Oui	13

Descriptive Statistics

Dependent Variable: MAUVAIS

EXP	PROTO	Mean	Std. Deviation	N
1	Non	41,43	17,68	7
	Oui	16,86	6,54	7
	Total	29,14	18,07	14
2	Non	27,00	15,75	5
	Oui	17,67	9,91	6
	Total	21,91	13,12	11
Total	Non	35,42	17,77	12
	Oui	17,23	7,91	13
	Total	25,96	16,19	25

Levene's Test of Equality of Error Variances

Dependent Variable: MAUVAIS

F	df1	df2	Sig.
1,204	3	21	,332

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept+EXP+PROTO+EXP * PROTO

Tests of Between-Subjects Effects

Dependent Variable: MAUVAIS

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected	2673,05	3	891.01	5.175	,003
Intercept	16246,9	1	16246,9	94.35	,000
EXP	284,31	1	284,31	1.651	,213
PROTO	1762,05	1	1762,05	10.23	,004
EXP * PROTO	355,92	1	355,92	2,067	,165
Error	3615,90	21	172,186		
Total	23137,0	25			
Corrected	6288,96	24			

a. R Squared = ,425 (Adjusted R Squared = ,343)

Interprétation: Pour les mauvaises réponses, la valeur de F pour l'utilisation ou pas du prototype est de $F(1,21)=10,233$ avec $p=0,004$. La p-valeur se trouvant au dessus de 0,05, le résultat confirme que les deux groupes ne sont pas différents et sont additifs (H_0)

Oneway

ANOVA

BONS

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2189,11	3	729,704	4,784	,011
Within Groups	3203,04	21	152,526		
Total	5392,16	24			

Contrast Coefficients

	EXP_PROTO			
Contrast	exp=1 proto=non	exp=1 proto=oui	exp=2 proto=non	exp=2 proto=oui
1	1	-1	0	0
2	0	0	1	-1
3	1	0	-1	0
4	0	1	0	-1

Contrast Tests

		Contrast	Value of Contrast	Std. Error	t	df	Sig. (2-tailed)
BONS	Assume equal variances	1	-24,43	6,60	-3,700	21	,001
		2	,33	7,48	,045	21	,965
		3	-8,33	6,87	-1,213	21	,239
		4	16,43	7,23	2,272	21	,034
	Does not assume equal variances	1	-24,43	6,83	-3,576	11,994	,004
		2	,33	7,42	,045	6,618	,966
		3	-8,33	6,08	-1,370	10,779	,198
		4	16,43	8,05	2,042	8,173	,075

Interprétation: Les résultats des analyses de ces deux groupes pris séparément i.e. avec une analyse de contraste (ANOVA – CONTRAST).   Nous avons fait 4 catégories.

Les deux premières catégories sont les suivantes:

- comparaison, pour le groupe 1, des deux sous groupes (avec et sans prototype)

- comparaison, pour le groupe 2, des deux sous groupes (avec et sans prototype)

-

- Les résultats sont les suivants:

- pour le groupe 1, la valeur statistique pour la relation d'interaction est de t= -3,700 avec p=0,001, soit inférieure à 0,05. Le résultat confirme que les deux sous groupes (avec et sans prototype) du groupe 1 sont différents et sont non additifs (H_1) ;

- pour le groupe 2, la valeur statistique pour la relation d'interaction est de t = 0,045 avec p=0,965, soit supérieur a 0,05, soit supérieure à 0.05. Le résultat confirme que les deux sous groupes (avec et sans prototype) du groupe 2 ne sont pas différents et sont additifs (H_0).

Les deux autres catégories comparent les non et les oui entre chaque groupe:

- comparaison entre l'expérience 1 et 2 des deux sous groupes sans prototype

- comparaison entre l'expérience 1 et 2 des deux sous groupes avec prototype

- Les résultats sont les suivants:

- pour les deux sous groupes sans prototype (non), la valeur statistique pour la relation d'interaction est de t= -1,213 avec p=0,239, soit supérieur à 0,05. Le résultat confirme que les deux sous groupes sans prototype des groupes 1 et 2 ne sont pas différents et sont additifs (H_0) ;

- pour les deux sous groupes avec prototype (oui), la valeur statistique pour la relation d'interaction est de t = 2,272 avec p=0,034, soit inférieure a 0,05. Le résultat confirme que les deux sous groupes avec prototype des groupes 1 et 2 sont différents et sont non additifs (H_1).

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
BONS	35,08	14,96	25
MAUVAIS	25,96	16,19	25

Correlations

		BONS	MAUVAI
BONS	Pearson Correlation	1,000	-,297
	Sig. (2-tailed)	,	,150
	N	25	25
MAUVAIS	Pearson Correlation	-,297	1,000
	Sig. (2-tailed)	,150	,
	N	25	25

Un premier test de corrélation (Pearson) indique qu'il n'y a pas de corrélation significative entre les bonnes et les mauvaises réponses : r= -0.261, p=0.189 de l'ensemble de l'échantillon. Un deuxième test de corrélation (corrélation de Spearman qui tient compte du rang de la réponse) indique aussi qu'il n'y a pas de corrélation significative entre les bonnes et les mauvaises réponses : r_s= -0.143, p=0.475 de l'ensemble de l'échantillon.

Nonparametric Correlations

Correlations

			BONS	MAUVAI
Spearman's rho	BONS	Correlation Coefficient	1,000	-,175
		Sig. (2-tailed)	,	,403
		N	25	25
	MAUVAIS	Correlation Coefficient	-,175	1,000
		Sig. (2-tailed)	,403	,
		N	25	25

Correlations

Descriptive Statistics

	Mean	Std. Deviation	N
BONS	36,04	14,47	24
MAUVAIS	24,04	13,32	24

Correlations

		BONS	MAUVAI
BONS	Pearson	1,000	S -,139
	Sig. (2-tailed)	,	,516
	N	24	24
MAUVAIS	Pearson	-,139	1,000
	Sig. (2-tailed)	,516	,
	N	24	24

Nous avons réalisé une analyse de sensitivité en enlevant le cas dont la mauvaise réponse est la plus haute (72) dans l'échantillon afin de vérifier si la corrélation entre les bonnes et les mauvaises réponses est toujours non significative. A cet effet, nous avons refait les tests de Pearson et Spearman. Les résultats sont les suivants : r= -0.102, p=0.475 et r_s= -0.040, p=0.847. Ces deux tests confirment à nouveau qu'il n'y a pas de corrélation significative.

Annexe K: Résultats des bonnes réponses

Commentaires sur les réponses
Ce sont les réponses telles que compilées. Cette documentation contient des termes
anglais que nous avons conservé tels quels. Nous avons aussi noté des fautes de français
que nous n'avons pas corrigées.

Description	JMD	M1O	M2	M3O	M4	M5	M6	M7O	M8O	M9O	M10	M11	M12O	M13	M14O	M16O	M17	M18O	M19	M20	M21	M22	M23O	M25O	M26O	M27O
Administrateur se branche au système	FP	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Se branche au système	TE	1	0	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Entre alias et mot de passe	Entry	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1
Valide inf sur formulaire (suppose 1 groupe de données)	Read	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Affiche la page du participant	Exit	1	0	1	1	1	1	1	1	1	1	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1
Messages d'erreur (alias ou mot de passe invalide)	Exit	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	1
Participant se branche au système	FP	1	1	1	1	0	1	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Se branche au système	TE	1	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	0	0	0	0	0
Entre alias et mot de passe	Entry	1	0	1	1	0	0	1	1	1	0	0	1	0	1	1	1	1	1	1	1	1	0	1	1	0
Valide inf sur formulaire (suppose 1 groupe de données)	Read	1	0	1	1	0	1	1	1	1	0	0	1	1	1	1	1	1	1	1	1	1	0	1	1	0
Affiche la page du participant	Exit	1	1	1	1	1	0	1	1	1	0	0	1	0	0	1	1	1	1	1	1	1	1	1	1	1
Messages d'erreur (alias ou mot de passe invalide)	Exit	1	1	1	1	0	1	1	1	1	0	0	1	0	1	0	1	1	0	1	1	1	1	1	1	1
Essai manqué pour branchement	FP	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0
Se branche (ou essai)	TE	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Entrée Alias et mot de passe	Entry	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Validation	Read	0	0	1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Refus (3 fois) ou plus de 21 utilisateurs	Exit	1	0	1	0	0	1	1	0	1	0	1	1	1	0	0	0	0	1	0	0	0	0	0	0	0
S'abonner au pool	FP	1	1	1	1	1	0	1	1	1	1	0	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Sélectionner l'abonnement	TE	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Entrée des champs nom, prénom, couriel, tel. Alias, passe, adresse, type	Entry	1	0	1	1	1	1	1	1	1	0	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1
Validation (2 groupes de données: paticipant et passe)	Read	1	1	0	1	0	0	1	1	1	0	0	1	1	1	1	0	1	1	1	1	1	1	1	1	1
Validation (2 groupes de données: paticipant et passe)	Read	1	1	0	0	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0
Ajouter un participant	Write	1	1	0	1	1	0	0	1	0	0	1	0	0	1	1	1	1	0	1	1	1	0	0	1	1
Courriel	Exit	1	0	1	1	0	1	1	1	1	1	1	1	0	1	1	0	0	0	1	1	1	1	1	1	1
Messages d'erreur (formulaire incomplet, alisa existant, arobas manquant, etc.)	Exit	1	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1
Activer-désactiver un participant	FP	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	0	1	1	1	1	1	1	1	1	1
Administrateur sélectionnne l'option d'activation	TE	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Lecture du formulaire d'activiation et participant (1 Groupe de données)	Read	1	1	1	1	1	1	0	1	1	1	1	1	0	1	1	1	1	1	1	1	0	1	0	1	1
Affichage du formulaire d'activation et nom des participants	Exit	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	1	1	1	1
Sélection d'un participant par l'administrateur (active)	Entry	1	1	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	0	1	0	0	1	1	1	1
Ecriture de l'activation (1 groupe de données)	Write	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	1
Message d'erreur ou retour à la page d'administration	Exit	1	0	1	1	1	1	1	1	1	1	1	1	1	0	1	0	1	1	1	1	1	0	1	1	1
Classement de la semaine	FP	1	1	1	1	0	0	1	1	1	1	0	1	0	1	1	0	1	0	1	0	1	1	0	0	0
Sélection du formulaire	TE	1	1	1	1	0	0	0	1	1	1	1	1	0	1	1	0	1	0	1	0	1	1	0	0	0
Année et semaine saisie	Entry	1	1	1	1	0	0	1	1	1	1	0	1	0	1	1	1	0	0	1	0	0	1	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	1	1	1	0	0	1	1	1	1	0	1	0	1	1	1	0	0	0	0	1	1	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Visualisation du formulaire demandé	Exit	1	1	1	1	0	0	1	1	1	1	0	1	0	0	1	1	1	0	0	0	1	1	0	0	0
Message d'erreur (semaine non sélectionnée)	Exit	0	1	1	0	0	0	1	0	0	1	0	1	0	1	1	0	0	0	1	0	0	0	0	0	0

Description	JMD	M1O	M2	M3O	M4	M5	M6	M7O	M8O	M9O	M10	M11	M12O	M13	M14O	M16O	M17	M18O	M19	M20	M21	M22	M23O	M25O	M26O	M27O
Classement général	PF	1	0	0	1	0	0	1	1	1	1	0	1	0	0	1	0	1	0	1	0	1	0	0	0	0
Sélection du formulaire	TE	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	1	0	1	0	1	0	0	0	0
Année et semaine saisie	Entry	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	1	0	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Visualisation du formulaire demandé	Exit	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	0	1	1	0	0	0
Message d'erreur (semaine non sélectionnée)	Exit	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Meilleure performance de la semaine	PF	1	0	0	1	0	0	1	1	1	1	0	1	0	0	1	0	1	0	1	0	1	0	0	0	0
Sélection du formulaire	TE	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	1	0	1	0	1	0	0	0	0
Année et semaine saisie	Entry	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	1	1	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Visualisation du formulaire demandé	Exit	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	1	0	0	0	1	1	0	0	0
Message d'erreur (semaine non sélectionnée)	Exit	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Statistiques peresonnelles par semaine	PF	1	0	0	1	0	0	1	1	1	1	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0
Sélection du formulaire	TE	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0
Année et semaine saisie	Entry	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	0	0	1	1	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Visualisation du formulaire demandé	Exit	1	0	0	1	0	1	1	1	1	0	0	1	0	0	1	1	1	0	0	0	1	1	0	0	0
Message d'erreur (semaine non sélectionnée)	Exit	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
Historique par semaine pour la saison précédente	PF	1	0	0	1	0	0	1	1	1	1	0	1	0	0	1	0	1	0	1	0	1	0	0	0	0
Sélection du formulaire	TE	1	0	0	1	0	0	0	1	1	0	0	1	0	0	1	0	1	0	0	0	1	0	0	0	0
Année et semaine saisie	Entry	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	1	0	0	1	1	1	0	0	1	0	0	1	1	0	0	0	0	1	1	0	0	0
Lecture des informations (hyp: 2 GD)	Read	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
Visualisation du formulaire demandé	Exit	1	0	0	1	0	1	1	1	1	0	0	1	0	0	1	1	1	0	1	0	1	1	0	0	0
Message d'erreur (semaine non sélectionnée)	Exit	0	0	0	0	0	0	1	0	0	0	0	1	0	0	1	0	1	0	1	0	0	0	0	0	0

Annexe L: Exemples de mauvaises réponses

Mesureur 1

ID	Type of component	Complete Identification	N M
101TR01	Triggering Event	Le participant demande à se brancher au systeme	
101P01	Functional process	Le participant complete le formulaire de branchement	
101P01EN01	Entry	Entrée l'Alias et le mot de passe	
101P01R01	Read	Le système valide l'alias et le mot de passe	
101P01EX01	Exit	Le système affiche un message d'erreur	
101P01EX02	Exit	Le système affiche la page personelle du participant	
101TR02	Triggering Event	L'Administrateur demande à se brancher au systeme	
101P02	Functional process	L'Administrateur complete le formulaire de branchement	
101P02EN02	Entry	Entrée de l'Alias et du mot de passe	
101P02R01	Read	Le système valide l'alias et le mot de passe	
101P02EX01	Exit	Le système affiche la page personelle du participant	
101P02EX02	Exit	Le système affiche un message d'erreur	
101P02W01	Write	Le système met à jour le nombre de tentative de branchement	1
101P02R02	Read	Le système consulte nombre de tentatives	2
101P02EX03	Exit	message d'erreur nombre de tentative maximal atteint	3
101P02EX04	Exit	Réinitialisation des champs	
102TR021	Triggering Event	Le participant sélectionne l'option abonnement	
102P01	Functional process	Le participant saisit les informations àfin de s'abonner	
102P01EN01	Entry	le participant complète le formulaire d'abonnement	
102P01R01	Read	Le système valide les infos du data groupe ``participant``	
102P01R02	Read	Le système valide les infos du data groupe ``type user``	
102P01W01	Write	Ajouter participant	
102P01E01	Exit	Envoi courriel confirmation	
102P02EX01	Exit	Message d'erreur pour remplire les champs obligatoire	
102P03EN01	Entry	alias saisi	4
102P03R01	Read	Système accède aux alias choisis	5
102P03EX01	Exit	Message d'erreur indiquant alias déjà choisi	6
102P04EX01	Exit	Message d'erreur indiquant courriel non valide	7
103TR01	Triggering Event	L'administrateur sélectionne l'option d'activation d'un participant	
103P01	Functional process	Activer un participant	
103P01EN01	Entry	Formulaire d'activation d'un participant	
103P01R01	Read	Liste des alias des participants	
103P01W01	Write	Sauvegarder l'user comme activé	
103P01EX02	Exit	retourne l'user à la page d'administration	
107TR01	Triggering Event	le participant sélectionne l'option "Résultats et statistiques"	8
107P01	Functional process	visualiser résultats et statistiques	9
107P01EN01	Entry	sélectionner	10
107P01R01	Read	accès page formulaire des statistiques	11
107P01R02	Exit	Afichage formulaire statistiques	12
107TR02	Triggering Event	le participant sélectionne l'option "Classement de la semaine"	
107P02	Functional process	Classement de la semaine	
107P02EN01	Entry	Année et semaine saisis	
107P02R01	Read	Accès PF_PARTIE	
107P02R02	Read	Accès PF_EQUIPE	
107P02W01	Write	Sauvegarde sur PF_CHOIX	
107P02EX01	Exit	Affichage Classement de la semaine	
107TR02	Triggering Event	le participant sélectionne l'option "Classement général"	

107P02	Functional process	Classement général	
107P02EN01	Entry	Année et semaine saisis	
107P02R01	Read	Accès PF_PARTIE	
107P02R02	Read	Accès PF_EQUIPE	
107P02W01	Write	Sauvegarde sur PF_CHOIX	13
107P02EX01	Exit	Affichage Classement général	
107TR02	Triggering Event	le participant sélectionne l'option " meillleur performance"	
107P02	Functional process	meillleur performance	
107P02EN01	Entry	Année et semaine saisis	
107P02R01	Read	Accès PF_PARTIE	
107P02R02	Read	Accès PF_EQUIPE	
107P02W01	Write	Sauvegarde sur PF_CHOIX	14
107P02EX01	Exit	Affichage meillleur performance	
107TR02	Triggering Event	le participant sélectionne l'option "Statistiques par semaine"	
107P02	Functional process	Statistiques par semaine	
107P02EN01	Entry	Année et semaine saisis	
107P02R01	Read	Accès PF_PARTIE	
107P02R02	Read	Accès PF_EQUIPE	
107P02W01	Write	Sauvegarde sur PF_CHOIX	15
107P02EX01	Exit	Affichage Statistiques par semaine	
107TR02	Triggering Event	le participant sélectionne l'option "Historique par semaine"	
107P02	Functional process	Historique par semaine	
107P02EN01	Entry	Année et semaine saisis	
107P02R01	Read	Accès PF_PARTIE	
107P02R02	Read	Accès PF_EQUIPE	
107P02W01	Write	Sauvegarde sur PF_CHOIX	16
107P02EX01	Exit	Historique par semaine	
		N M = nombre de mauvaises réponses (en gris)	
		Chiffre répété 2 fois: même mauvaise réponse	

Mesureur 2

ID	Type of component	Complete Identification	N M
ucs101-7	Functional process	brancher au syteme comme administrateur	
ucs101-8	Triggering Event	brancher au syteme comme participant	
ucs101-3	Entry	entrer donnée	
ucs101-4	Read	comparer alias	
ucs101-5	Read	comparer mots de passe	1
ucs101-6	Functional process	afficher la page d'administrateur	
ucs101-7	Functional process	afficher la page de l'utilisateur	
ucs101-9	Exit	erreur de validation	
ucs101-11	Exit	refusé d'accés (errur superieur a 4)	
usc102-1	Functional process	selectionner l'option abonnement	2
usc102-2	Triggering Event	afficher le formulaire d'abonnement	3
usc102-3	write	saisir des attributs	4
usc102-4	Exit	erreur sur le champ de saisie	5
usc102-5	Exit	erreur sur l'alias	6
usc102-6	Exit	erreur sur le courriel	7
usc102-7	Exit	format des champs	8
usc102-16	Functional process	validation des données saisies	9
usc102-17	Triggering Event	affichage des données de validation	10
usc102-18	Functional process	envoyer un courriel de confirmation aux participants	11
usc102-19	Triggering Event	courriel envoyer	12
usc102-20	Read	lire l'alias et mot de passe	
usc102-22	Read	lire le mot de passe	
usc102-23	write	ecrir l'alias et mot de passe	
usc103-1	Functional process	selectionner l'option d'activation	
usc103-2	Triggering Event	afficher la liste des alias	
usc103-3	Functional process	choix de l'utilisateur	
usc103-4	Triggering Event	afficher le formulaire d'activation	
usc103-5	write	enregistrer le changement	
usc103-6	Functional process	retour a la page de l'administrateur	
usc107-1	Functional process	selctionner resultat	
usc107-2	Triggering Event	afficher resultat	
usc107-3	Triggering Event	afficher formulaire	
usc107-4	Functional process	choix des resultat statistique	
usc107-5	Functional process	fermeture de l'horizon des résultat statistique	
usc107-6	Triggering Event	ouvrir la pagec personnel	
usc107-7	Exit	erreur aucun resultat disponible	
usc107-7	Exit	Message d'erreur (semaine non sélectionnée)	

Mesureur 3

ID	Type	Complete Identification	N M
UCS101_1	Triggering Event	Compléter les champs du formulaire de branchement	
UCS101_2	Triggering Event	le participant se brancher au système	
UCS101_3	Entry	Alias et Mot de passe : l'utilisateur complète le champas de formulaire de branchement	
UCS101_4	Functional process	le participant se brancher au système	
UCS101_5	Functional process	Le système affiche la page personelle du participant.	
UCS101_6	Read	Le système accède au fichier des "mot de passe" (PF_PARTICIPANT). C'est implicite	
UCS101_7	Exit	Le système affiche la page personnelle du participant.	
UCS101_8	Exit	Affichage du message d'erreur.	
UCS101_8	Exit	Affichage du message : "Alias ou mot de passe invalide! ..."	1
UCS101_9	Write	Le système vide le contenue des champs du formulaire.	2
UCS101_10	Triggering Event	l'adminstrateur se brancher au système	
UCS101_11	Triggering Event	l'administrateur compléter les champs du formulaire de branchement	
UCS101_12	Entry	Alias et Mot de passe : l'utilisateur complète le champas de formulaire de branchement	
UCS101_13	Functional process	l'adminstrateur du pool se brancher au système	
UCS101_14	Read	Le système accède au fichier des "mot de passe" (PF_PARTICIPANT). C'est implicite	
UCS101_15	Exit	Le système affiche la page principale de l'administrateur	
UCS101_16	Exit	Affichage du message : "Alias ou mot de passe invalide! ..." (idem)	3
UCS101_16	Exit	Affichage du message d'erreur.	4
UCS101_17	Write	Le système vide le contenue des champs du formulaire.	
	Triggering Event	L'alias ou le mot de passe n'est pas valide	
	Entry	L'alias ou lemot de passe n'est pas valide	
	Functional process	taraitement du cas ou le mot de passe ou l'alias n'est pas valide	
	Exit	Affichage du message : "Alias ou mot de passe invalide! ..." (idem)	4
		Le système vide le contenue des champs du formulaire.	
UCS101_9	Triggering Event	l'utilisateur à assayer de se brancher à pour une quatrième fois.	
UCS101_10	Entry	Données saisies non valide	
UCS101_9	Functional process	Vidage du contenu des champs du formulaire (par le système)	
UCS101_	Exit	Affichage du deuxieme message.	
	Write	Le système vide le contenu du formulaire.	
UCS101_11	Functional process	Le système bloque la possibilité de branchementà l'utilisateur après la troisième tentative	5
UCS102_1	Functional process	Le participant accès au formulaire d'abonnement	
UCS102_2	Triggering Event	L'utilisateur sélectionne l'option d'abonnement	
UCS102_3	Entry	Saisi des information dans les champs du formulaire	
UCS102_4			
UCS102_4	Exit	Le système envoi un courriel de confirmation d'abonnement.	6
UCS102_5	Exit	Le système affiche le formulaire d'abonnement.	7
UCS102_6	Exit	Le système fournit un accès à la page personnelle du participant.	8
UCS102_7	Exit	Affichage du message "Vous devez remplir tous les champs précédés d'une étoile"	9
UCS102_8	Exit	Affichage du message qui indique que l'alias choisit par le participant est déjà existant dans le système.	10
UCS102_9	Exit	Affichage du message :"L'adresse de courriel est invalide! …"	11
UCS102_10	Exit	Affichage du message :" Le mot de passe doit être entre a et 10 caractères de long, …"	12
UCS103_1	Functional process		
UCS103_1	Entry	L'administrateur sélectionne l'option d'activation d'un participant.	
	Entry		
UCS103_2	Triggering Event	L'administrateur sélectionne l'option d'activation d'un participant.	
UCS103_3	Functional process	Accès au formulaire d'activation d'un participant	13
UCS103_4	Exit	Affichage du formulaire d'activation d'un participant.	14

UCS103_5	Triggering Event	L'administrateur du pool sélectionne le participant à activer.	15
UCS103_6	Entry	Liste des alias présente dans le système.	16
UCS103_7	Functional process	L'administrateur active le participant.	
UCS103_8	Exit	Affichage des informations du participant dans le formulaire d'activation.	
UCS103_9		Affichage de la page d'administration du pool.	
UCS103_10	Write	Sauvegarde du changement	
UCS107_1	Functional process	Visualisation des résultats et statistiques.	
UCS107_2	Triggering Event	Le participant sélectionne l'option des résultats et statistiques.	
UCS107_3	Entry	Le participant sélectionne dans le formulaire, l'années et le mois.	
UCS107_4	Exit	Affichage u formulaire des résultats et statistiques.	
UCS107_5	Exit	Ouverture de la page personnelle du participant.	
UCS107_6	Exit	Affichage du message :"aucun résultat disponible dans le système pour la semaine sélectionnée".	

Mesureur 4

ID	Type of component	Complete Identification	N M
UCS101_1	Functional process	Se brancher au systeme	
UCS101_2	Triggering Event	Execution du systeme	
UCS101_3	Entry	Alias	
UCS101_4	Entry	Mot de passe	1
UCS101_5	Read	lire PF_PARTICIPANT	
UCS101_6	Exit	Page personnelle du participant	
UCS101_7	Exit	Message d'erreur 1	
UCS101_8	Exit	Message d'erreur 2	2
UCS101_9	Functional process	Se brancher au systeme	
UCS101_10	Triggering Event	Execution du systeme	
UCS101_11	Entry	Alias	
UCS101_12	Entry	Mot de passe	1
UCS101_13	Read	lire PF_PARTICIPANT	
UCS101_14	Exit	Page personnelle de l'administrateur	
UCS101_15	Exit	Message d'erreur 1	
UCS101_16	Exit	Message d'erreur 2	2
UCS102_1	Functional process	S'abonner au Pool	
UCS102_2	Triggering Event	Selectionner l'option d'abonnement	
UCS102_3	Entry	Nom	
UCS102_4	Entry	prenom	3
UCS102_5	Entry	courriel	4
UCS102_6	Entry	numero de telephone	5
UCS102_7	Entry	Alias	6
UCS102_8	Entry	Mot de passe	7
UCS102_9	Entry	adresse postale	8
UCS102_10	Entry	type de participation	9
UCS102_11	Read	lire PF_PARTICIPANT	
UCS102_12	Write	PF_PARTICIPANT	
UCS102_13	Write	PF_TYPE_USAGER	10
UCS102_14	Exit	courriel pour le participant	
UCS102_15	Exit	Message : tous les champs precedes de *	
UCS102_16	Exit	Message : alias deja existant	11
UCS102_17	Exit	Message : adresse courriel incorrecte	12
UCS102_18	Exit	Message : mot de passe incorrecte	13
UCS103_1	Functional process	Activer un participant	
UCS103_2	Triggering Event	Option activer un participant	
UCS103_3	Functional process	selectionner un participant parmi la liste affichee	14
UCS103_4	Read	lire PF_PARTICIPANT	
UCS103_5	Entry	no_participant	
UCS103_6	Write	PF_PARTICIPANT	
UCS103_7	Exit	informations participant sur le formulaire	15
UCS103_8	Functional process	Desactiver un participant	16
UCS103_9	Triggering Event	Option activer un participant	17
UCS103_10	Functional process	selectionner un participant parmi la liste affichee	18
UCS103_11	Read	lire PF_PARTICIPANT	19
UCS103_12	Entry	no_participant	20
UCS103_13	Write	PF_PARTICIPANT	21

UCS103_14	Exit	informations participant sur le formulaire	22
UCS103_15	Exit	liste des participants existants	23
UCS103_16	Functional process	selectionner un participant parmi la liste affichee	24
UCS103_17	Triggering Event	option activer participant	25
UCS103_18	Read	lire PF_PARTICIPANT	26
UCS103_19	Entry	no_participant	27
UCS103_20	Exit	liste des participants existants	28
UCS107_1	Functional process	visualiser les resultats et statistiques	29
UCS107_2	Triggering Event	option resultats et statistiques	30
UCS107_3	Entry	annee	31
UCS107_4	Entry	semaine	32
UCS107_5	Read	lire PF_PARTICIPANT	33
UCS107_6	Read	lire PF_RESULTAT_PARTICIPANT	34
UCS107_7	Exit	resultats (nb_victoire, nb_defaite)	35
UCS107_7'	Exit	Message : aucun resultat disponible	36
UCS107_8	Functional process	Afficher les resultats selon les options : de la semaine	
UCS107_9	Triggering Event	option : classement de la semaine	
UCS107_10	Entry	option : classement de la semaine	
UCS107_11	Read	lire PF_PARTIE	
UCS107_12	Exit	resultats de la semaine	
UCS107_13	Functional process	Afficher les resultats selon les options : classement general	
UCS107_14	Triggering Event	option : classement GENERAL	
UCS107_15	Entry	option : classement GENERAL	
UCS107_16	Read	lire PF_PARTICIPANT	
UCS107_17	Read	lire PF_PARTIE	
UCS107_18	Exit	resultats : CLASSEMENT GENERAL	
UCS107_19	Functional process	Afficher les resultats selon l'option : MEILLEURE PERFORMANCE	
UCS107_20	Triggering Event	option : MEILLEURE PERFORMANCE	
UCS107_21	Entry	option : MEILLEURE PERFORMANCE	
UCS107_22	Read	lire PF_PARTICIPANT	
UCS107_23	Read	lire PF_PARTIE	
UCS107_24	Exit	resultats :MEILLEURE PERFORMANCE	
UCS107_25	Functional process	Afficher les resultats selon l'option : STATISTIQUES PAR SEMAINE	
UCS107_26	Triggering Event	option : STATISTIQUES PAR SEMAINE	
UCS107_27	Entry	option : STATISTIQUES PAR SEMAINE	
UCS107_28	Read	lire PF_PARTICIPANT	
UCS107_29	Read	lire PF_PARTIE	
UCS107_30	Exit	resultats :STATISTIQUES PAR SEMAINE	
UCS107_31	Functional process	Afficher les resultats selon l'options : HISTORIQUE	
UCS107_32	Triggering Event	option : HISTORIQUE	
UCS107_33	Entry	option : HISTORIQUE	
UCS107_34	Read	lire PF_PARTICIPANT	
UCS107_35	Read	lire PF_ANNEE	
UCS107_36	Read	lire PF_PARTIE	
UCS107_37	Exit	resultats :HISTORIQUE	

Mesureur 5

ID	Type of component	Complete Identification	N M
USC101-1	Functional process	Se Brancher au système	
USC101-2	Boundary	Le clavier du client et la connection internet	1
USC101-3	Triggering Event	Le participant ou l'administrateur entre son identification et mot de passe et appuie sur enter ou clique sur le bouton branchement	2
USC101-4	Entry	Alias et mot de passe provenant du formulaire de branchement	
USC101-5	READ	Le systeme lit le mot de passe dans la table PF_PARTICIPANT et valide le mot de passe	
USC101-6	READ	Le systeme fait la sommation des connections dans le systeme.	3
USC101-7	Read	Le systeme lit le type de l'usager (administrateur ou participant)	4
USC101-8	Write	MET NONBRE CONNEXION a 1	5
USC101-9	Exit	Message trop de connection.	6
USC101-10	Exit	Message Alias ou mot de passe invalide !	
USC101-11	Exit	Message Connexion accepté	
USC101-12	Exit	Le formulaire de branchement vide	
USC101-13	Exit	La page personnel du participant.	
USC101-14	Exit	La page principal de l'administrateur du pool	
USC102-1	Functional process	Afficher le formulaire d'abonnement	
USC102-2	Boundary	La souris du client et la connection internet	7
USC102-3	Triggering Event	L'usager clique sur abonnement dans la page principal.	
USC102-4	Entry	Le clic sur le bouton abonnement	8
USC102-5	Read	Le contenu de la page web sur le serveur linux	9
USC102-6	Read	Lire les options d'utilisation entre par l'administrator (USC104)	10
USC102-6	Exit	Afficher le formulaire d'abonnement a l'ecran du client	
USC102-7	Exit	Afficher un message que l'abonnement n'est plus disponible.	
USC102-8	Functional process	Saisir Information dans le formulaire d'abonnement	
USC102-9	Boundary	Le clavier et la souris du client et la connection internet	
USC102-10	Triggering Event	L'usager clique sur confirmer dans le formulaire d'abonnement	
USC102-11	Entry	Le systeme lit les champs nom, prénom,courriel,alias,mot de passe et confirmer mot de passe dans le formulaire d'abonnement.	
USC102-12	Write	Ecrire dans la table PF_Participant les informations nom, prénom,courriel,alias,mot de passe	
USC102-13	Read	Le systeme lit les alias dans la table PF_Paticipant	11
USC102-14	Exit	Message qui nous incite a remplir les champs precedes d'une étoile dans le systeme et retour au formulaire d'abonnement.	12
USC102-15	Exit	Message qui indique que l'alias existe deja retour au formulaire d'abonnement	13
USC102-16	Exit	Message qui indique que le courriel ne contient pas d'arobas et retour au formulaire d'abonnement.	14
USC102-17	Exit	Message qui indique que l'alias ou le mot de passe n'est pas valide et retour au formulaire d'abonnement	15
USC102-18	Exit	Message de confirmation de l'abonnement et sortie du systeme.	16
USC103-1	Functional process	L'administrateur accede au formulaire d'activation d'un participant.	
USC103-2	Boundary	La souris du client et la connection internet (page web)	
USC103-3	Triggering Event	L'administrateur clique sur le lien HTML Activer un participant.	
USC103-4	Entry	Le clique sur le lien html dans la page principal de l'administrateur.	
USC103-5	Read	Lire le contenu de la page web Formulaire d'activation sur le serveur linux.	17
USC103-6	Exit	Afficher le Formulaire d'activation a travers le fureteur internet de l'administrateur.	18
USC103-7	Functional process	L'administrateur selectionne le participant à activer	19
	Boundary	La souris du client et la connection internet (page web)	7
USC103-8	Triggering Event	L'administrateur selectionne l'annee d'activation et l'alias du concurant à partir du liste concurante.	
USC103-9	Entry	La selection de l'administrateur pour le participant et l'année a travers la page web.	20
USC103-10	Read	Lire la list des alias pour l'annee choisi.	21
USC103-11	Read	Lire l'information Nom, PRENOM,Courrier électronique, téléphone dans la table PF_PARTICIPANT	22

USC103-12	Exit	Afficher cette information dans le formulaire d'activation de l'administrateur.	23
USC103-13	Functional process	L'administrateur active le participant.	24
USC103-14	Boundary	La souris du client et la connection internet (page web)	7
USC103-15	Triggering Event	L'administrateur active sur le bouton sauvegarder	25
USC103-16	Entry	La selection entre active et deactive	26
USC103-17	Write	Ecrire le bit actif dans la table	27
USC103-18	Exit	Retourne a la page d'adminitration du pool.	
USC107-1	Functional process	Le participant accède au formulaire des resultats et des statistique.	28
USC107-2	Boundary	La souris du client et la connection internet (page web)	7
USC107-3	Triggering Event	Le clique dans la page personnel du participant du lien html RESULTATS ET STATISTIQUE	29
USC107-4	Read	Le systeme lit le contenu de la page de resultats et statisque sur le serveur Linux (WEB)	30
USC107-5	Exit	La page des resultats et statiques s'affiche dans le fureteur internet du participant.	31
USC107-6	Functional process	Le participant sélectionne les résultats et les statisques a visualiser.	32
USC107-7	Boundary	La souris du client et la connection internet (page web)	7
USC107-8	Triggering Event	Le clique sur le lien html dans la page web des résultats et statistique.	33
USC107-9	Entry	La selection du type de resultats désirée par le participant.	34
USC107-10	Read	Lire les tables de resultats dans la base de donnees MySQL selon le format choisi.	35
USC107-11	Read	Lire les donnes de la page sur le serveur linux (WEB)	36
USC107-12	Exit	Afficher la page web des resultat dans le fureteur internet du client.	37
USC107-13	Functional process	Le participant quitte le formulaire des resultats et statistique.	38
USC107-14	Boundary	La souris du client et la connection internet (page web)	7
USC107-15	Triggering Event	Le clique sur le lien html dans la page web des résultats et statistique pour quitter.	39
USC107-16	Read	Lire la page personnel du participant dans le serveur web.	40
USC107-17	Exit	Afficher la page web des resultat dans le fureteur internet du client.	

Annexe M: Spécifications présentées aux mesureurs débutants

Commentaires sur la documentation fournie

Voici un exemple de documentation fournie aux mesureurs débutants. Il s'agit des deux premières étapes de la première spécification. Cette documentation contient des termes anglais que nous avons conservé tels quels. Nous avons aussi noté de nombreuses fautes de français que nous n'avons pas corrigées.

UCS101. Se brancher au système

Brève description

Ce cas d'utilisation décrit comment les participants et l'administrateur du « pool » se branchent au système pour accéder à leur page personnelle.

Flow of Events

Basic Flow

Étape 1 : **Le participant complète le formulaire de branchement**

Ce cas d'utilisation débute lorsque l'utilisateur, un participant ou l'administrateur du pool, complète les champs du formulaire de branchement et se branche au système.

Le formulaire contient les champs suivants:

> ➢ Alias

> ➢ Mot de passe

Étape 2 : **Le système valide les informations du formulaire**

Le système valide les informations (alias et mot de passe) du formulaire et affiche la page correspondant au profil de l'utilisateur. Pour un participant, le système affichera la page personnelle du participant, alors que pour l'administrateur du pool, il affichera la page principale de l'administration du pool.

Alternative Flows

A1. Alias ou mot de passe invalide

- Étape 2 : **Le système valide les informations du formulaire**

Lors de la validation de l'alias et du mot de passe par le système, si l'une ou l'autre des données saisies n'est pas valide, c'est-à-dire que la combinaison des deux informations ne correspond à aucun utilisateur dans le système, alors le système affichera le message suivant dans le formulaire de branchement :

« Alias ou mot de passe invalide! Veuillez entrer à nouveau les paramètres, en prenant soin de vérifier la casse. »

Le système vide le contenu des champs du formulaire et le traitement reprend à l'étape 1.

A1. 3 essais de branchement infructueux

- Étape 2 : **Le système valide les informations du formulaire**

Lors de la validation de l'alias et du mot de passe par le système, si l'utilisateur à essayer de se brancher à pour une quatrième fois, le système ne valide plus les informations du formulaire. Il affiche plutôt le message suivant :

« Alias ou mot de passe invalide! L'accès au système vous est refusé dans la session en cours. Vous devez fermer votre fureteur et accéder le site pour pouvoir essayer à nouveau. Si vous ne vous souvenez plus de votre alias ou de votre mot de passe, veuillez communiquer avec l'administrateur du Pool (<adresse du courriel de l'administrateur du Pool>). »

Le système vide le contenu des champs du formulaire et le traitement est arrêté.

Special Requirements

SR1. Limite du nombre d'essai de branchement à 3

Le système doit bloquer la possibilité de branchement à l'utilisateur après la troisième tentative consécutive de branchement dans la même session Internet.

SR2. Accès simultané de 20 utilisateurs

Le système doit permettre l'accès simultané à l'application jusqu'à concurrence de 21 utilisateurs, incluant l'administrateur du Pool.

Preconditions

Le participant est abonné

Pour pouvoir se brancher à l'application, un participant doit d'abord s'être abonné au système (UCS102).

Postconditions

Aucune.

Extension Points

Aucun.