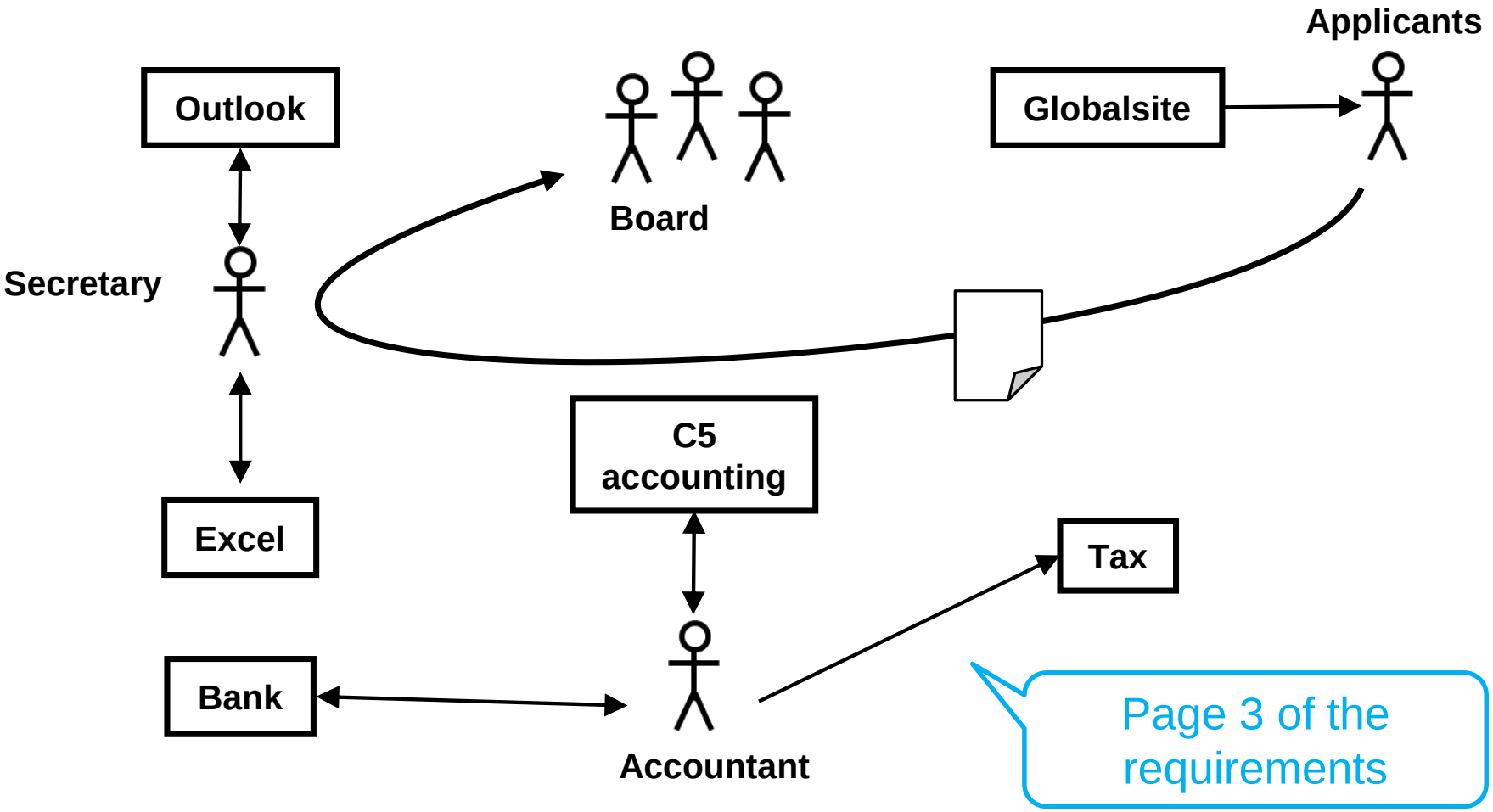
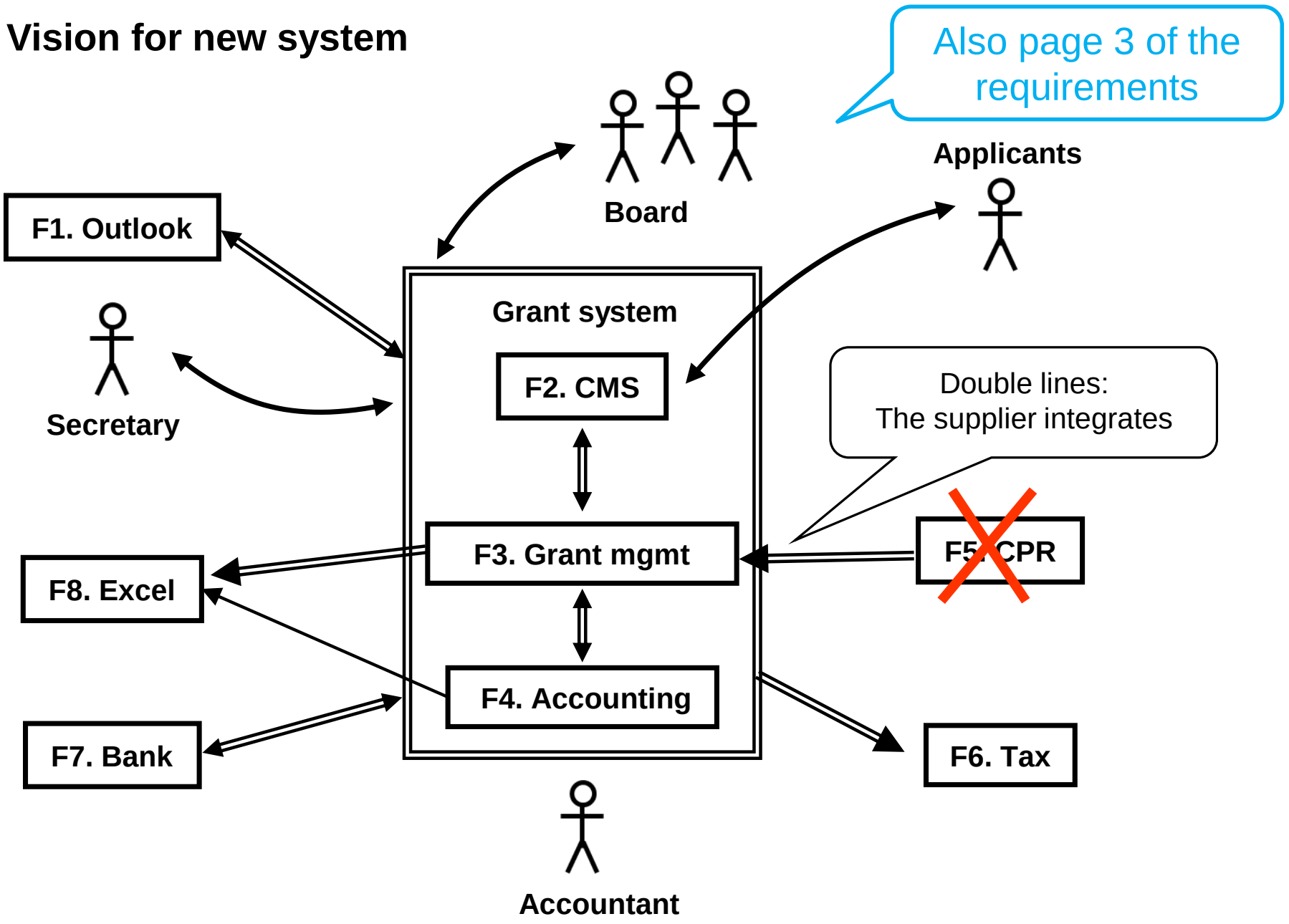
Problem-oriented requirements in practice – a case study

Soren Lauesen, March 2018
IT-University of Copenhagen
E-mail: slauesen@itu.dk http://www.itu.dk/people/slauesen

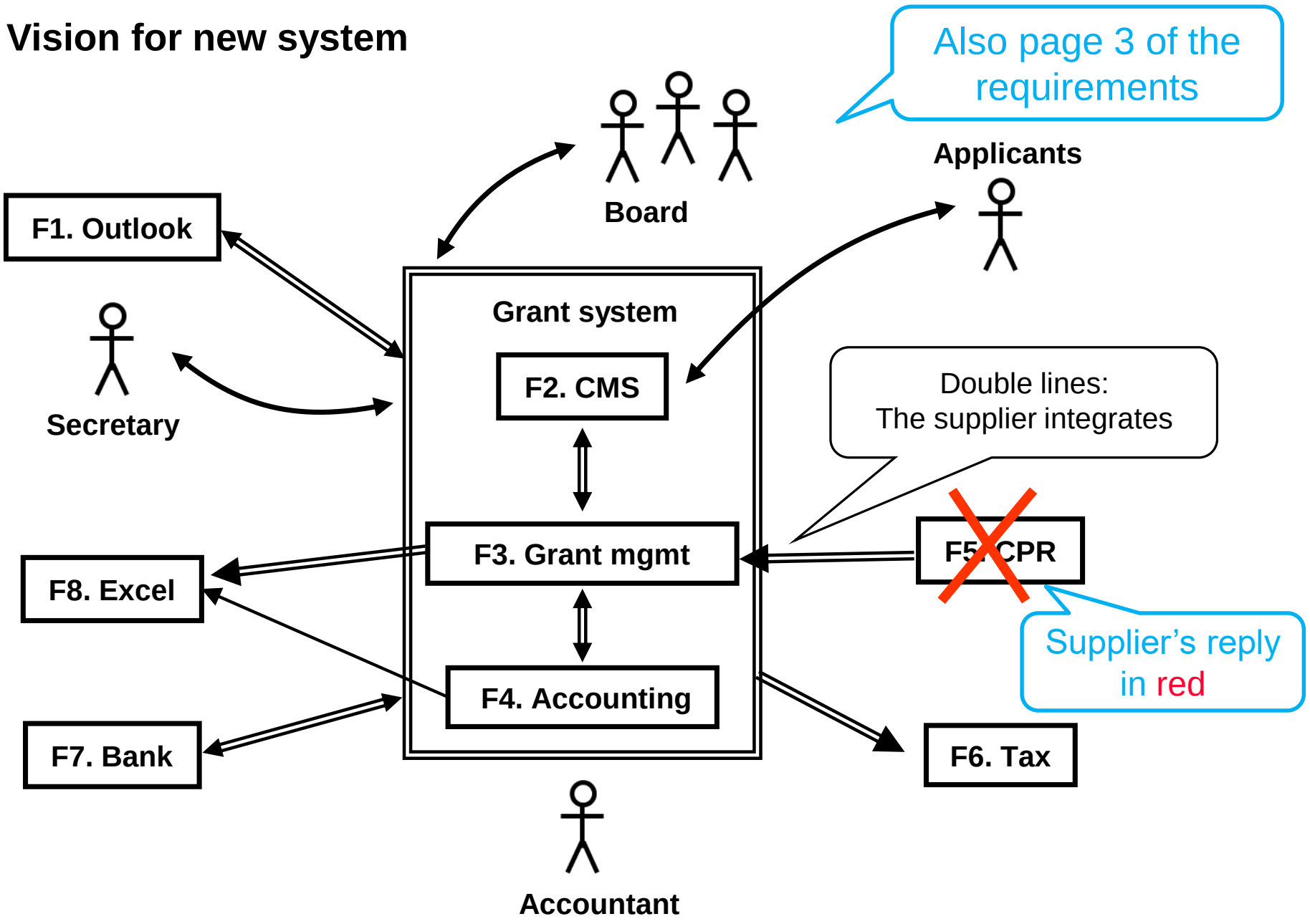
Y-foundation: Old system. 300 grant applications twice a year



Vision for new system



Vision for new system



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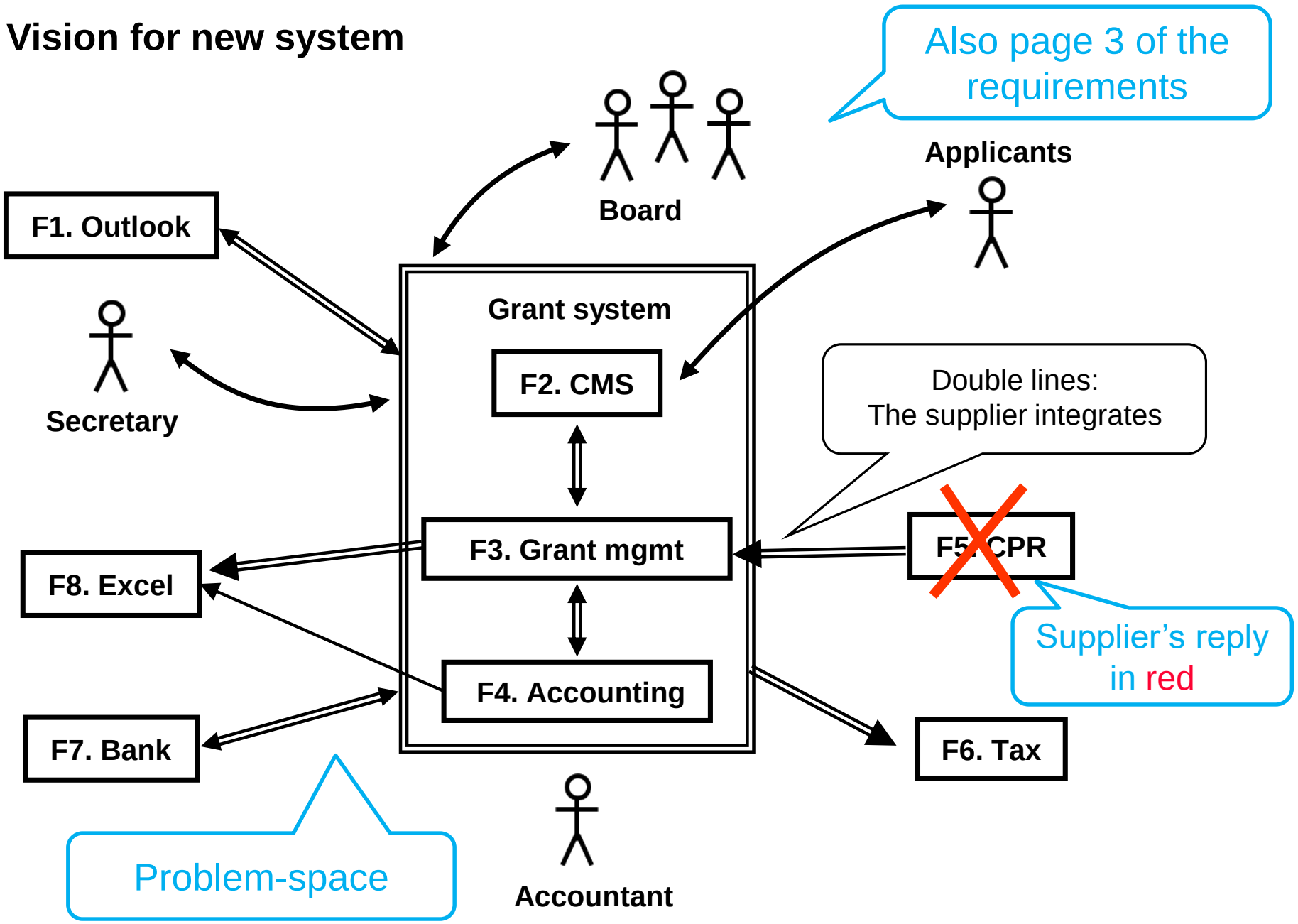

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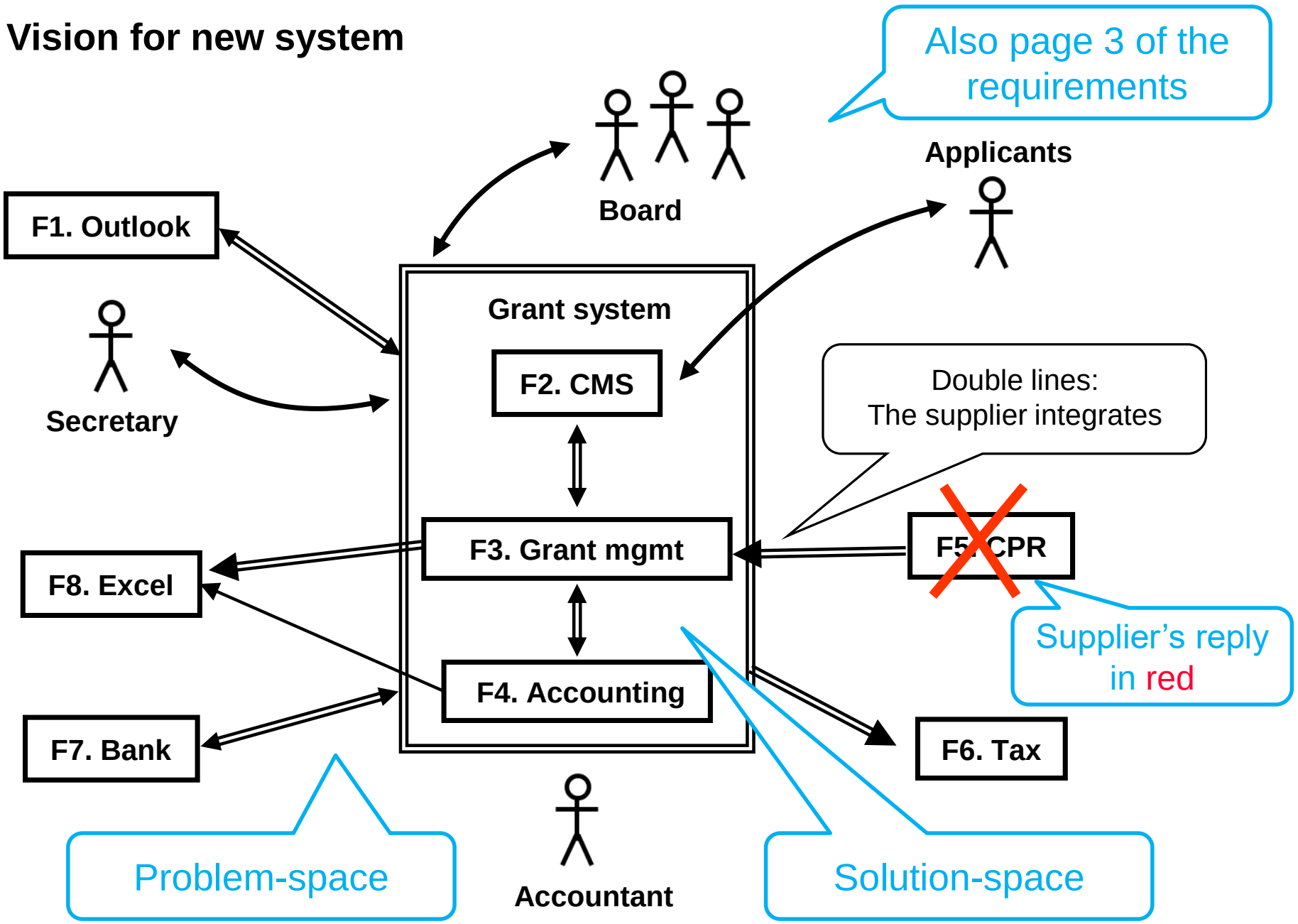

Functional requirements in various styles

Use case 25: Record conclusion and private comments.
Trigger: The user wants to record conclusion and private comments.
Precondition: The user is logged on.

User clicks Open Applic. List.	System shows list.
User selects the application.	System shows the details.
User edits data.	System records the data.

Functional requirements in various styles

Oops-trigger: When is it used and for what?

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User story 75: As a board member, I want to see the grant application's traffic lights, so I can record my conclusion and private comments.

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Problem-oriented: Don't describe what the system shall do – describe what it will be used for.

Problem-oriented requirement: Support all tasks (12 in total)

C21. During the board meeting

This task describes what the board members do with the grant applications during the meeting.

Start: When discussion of the applications start.
End: When all applications have been discussed for now.
Frequency: Twice a year.
Users: Board members. The four board members and the secretary look at the applications at the same time and note their own comments directly in the system. See also access right in H1.

Subtasks and variants:	Proposed solution:	Code:
1. Look at each application. See what the other board members mean, preferably live as soon as they have indicated something. Look at the full application and attached documents.	As C20. The system updates the list of applications without the board members having to click a "refresh".	
2. Enter your own comments that are not intended for others.	As C20.	
3. Maybe record the joint conclusion.	As C20.	

Supplier's reply in red

The supplier's solution note to Task C20

Solution note

Board members access the system through a web-browser. This will work from a traditional PC as well as an iPAD via VPN. The solution is outlined below and presented to the Y-Foundation.

Round: 2013.1 - Spring 2013

ID	Area	Category	State	Title	Name	Applied	Granted	JD	Hph	Joha	mmq
	All	All	All								
11-1042	Engineer	Travel	40 Granted	Study at MIT	Helle Pedersen	45,000	45,000				
11-1042	Engineer	Travel	40 Granted	Study in London	Lotte Christensen	25,000	20,000				
11-1042	Engineer	Project	110 Rejected	Low cost sewers in Africa	Peter Hansen	1.325,000					
11-1042	Medicine	Project	110 Rejected	Bipolar monitoring	Morten Skovgaard	625,000					
11-1042	Medicine	Other	40 Granted	Multi-resistence	Steffen Hansen	225,000	225,000				
11-1042	Medicine	Travel	40 Granted	Study in Beijing	Lis Hansen	50,000	20,000				

This screen is the key for all grant management in the system and is used continuously by secretary as well as board members. It is possible to filter on the various columns, including the "traffic lights" for the individual board members. In this way it is easy to see whether something is new. Board members can directly from this screen change state and write public as well as private comments for each application, and through the link access the application to see details. Depending on the specific configuration it will also be possible to access for instance the application document directly from the list.

C20. Assess applications before the board meeting

This task describes what a board member does before the board meeting.

Start: When an advice arrives from the secretary or a board member about looking at grant applications, or when it is time to look at them.

End: When all of them have been assessed or there is no more time available right now.

Frequency: Daily when the application deadline gets near.

Figure 1. The Y-Foundation requirements

Contents

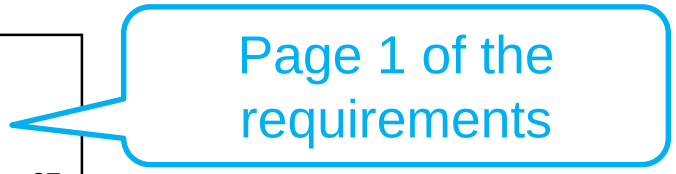

Figure 1. The Y-Foundation requirements

Contents

Page 1 of the requirements

34 pages in request for proposal.
44 with supplier's reply.
Tasks 30% Data 20%

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Chapter G to L:
80-90% reuse

Usability requirements

Usability I1. Ease-of-learning and task efficiency

Requirements:	Proposed solution	Code
1. The secretary must be able to carry out the tasks in Work Area 1 without serious usability problems ["Serious" defined below the table]	With a functional version of the system, a secretary carries out examples of tasks without guidance. On the way, the secretary may ask the supplier's expert. The secretary assesses whether the system is sufficiently efficient and easy to use. Offered.	
2. Board members … (similar)	(similar) Offered.	
3. Potential applicants must be able to carry out the tasks in Work Area 4 without serious usability problems.	A think-aloud test with three potential applicants is made. The user cannot ask when in doubt. This is the customer's own responsibility.	

A **serious** usability problem is a situation where the user:

a. is unable to complete the task on his own,
b. or believes it is completed when it is not,
c. or complains that *it is really cumbersome*,
d. or the test facilitator observes that the user doesn't use the system efficiently.

Y-foundation: Supplier selection

Benefit and cost for each proposal, calculated for 5 years, Euro

	A	B	C
Benefit, case management	107,000	130,000	130,000
Benefit, board	40,000	70,000	70,000
Development and licenses	-100,000	-137,000	97,000
Operation and support	-32,000	-94,000	-88,000
Risc addition	30% -30,000	15% -18,000	0% 0
Net value	-15,000	-49,000	15,000

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Experienced people:
60% - 100% more realistic

Issues recorded during the project

45 defects related to these requirements:
- 18 related to usability (Chapter I)
- 10 to security (H)
- 7 to deployment (J)
- 5 to tasks (C)
- 2 to data (D)
- 1 to system integration (F)
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49 failed expectations
22 changes
14 ignore
130 Total

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Delayed 9 months – why?

2013 Jan: Consultant starts. Spends 40 hours.
2013 Apr: Requirements version 2.4 sent to three suppliers. Ask for meeting.
2013 Jun: Version 2.5 after 6 supplier comments. Request for proposal.
2013 Sep: Contract version 2.1 with proposal. Signed.
2013 Dec 20: Expected delivery date including 4 week operational test.
2013 Dec 23: On-line grant application part deployed.
2014 Mar: Board meeting successful. Secretary part miserable.
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Why?

1. Supplier too optimistic with system integration.
2. Browsers treat Office documents differently, e.g. login for each document.
3. Supplier used subcontractor without domain knowledge.
4. We accepted and paid delivery 2014 Jan 31 – the 12 open issues were just “maintenance”. Result: Everything slowed down.

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No other full, real-life requirements and experiences published (Reviewers agreed)

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4. Customer staff could understand and comment on the requirements.
5. Suppliers could write good proposals with modest effort (20-30 hours).
6. Easy to assess proposals and select winner.
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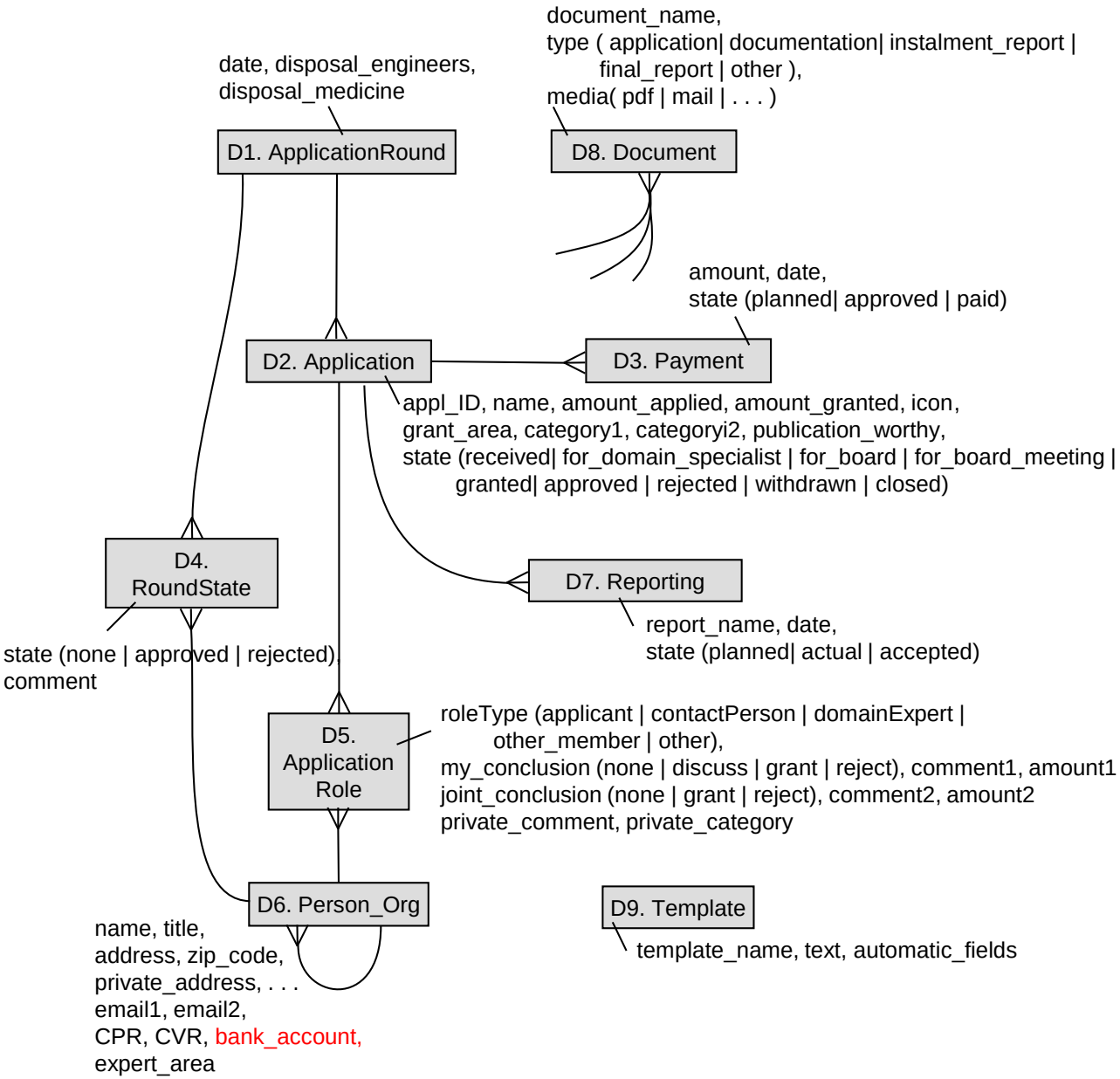
But you need experience too
A fool with a template is still a fool

Figure D. Data model for the Grant System



D2. Application

Examples: An application about study at a foreign university. An application about low cost sewers in Africa.
Data source: An application may be created by a secretary or by an applicant through the web site. Application data can be changed by a secretary and some fields by board members.
Data use: The application is used during the grant process.

Data volume:	Proposed solution:	Code:
1. Around 600 applications are created a year.	Created automatically based on applications from the web-site plus the secretary when applications are received by email.	

Fields and relationships:	Proposed solution:	Code:
2. appl_ID.	Assigned automatically by the system.	
3. name: A name the applicant specifies. May be changed by the secretary.	Yes.	
4. amount_applied: The total amount applied for.	Yes.	
5. amount_granted: The total amount granted.	Yes.	
6. creditor_account: (The account number where payments to the applicant is recorded). Isn't used.	(See bank account in D6.) There should be an account number somewhere (IBAN)	
7. grant_area (engineering | medicine).	Yes	
8. category1: e.g. travels, publications . . .	The customer maintains this category.	
9. category2: e.g. a priority.	The customer maintains this category.	
10. publication_worthy: yes/no. Indicates to the web-editor that the application should be shown on the web site.	Yes.	
11. state: See the requirements note below.	The states outlined below are supported.	
12. applicationRound: Relation to D1.	Yes.	
13. payments: Relation to one or more payments.	When an application is granted, a payment matching the granted	

B1. Visions about the future work flow

The Foundation's vision is to handle applications according to the flow below in the future. Only the normal flow is shown. The related tasks and subtasks are shown for each step. Chapter C shows the details.

Steps in the flow	Tasks and subtasks
1. The applicant investigates what can be granted and formalities about the application.	Entire C40.
2. The applicant fills in the application form on-line, attaches various documents and sends the application.	C41-1 to 5.
3. The Foundation secretary makes a first assessment of the application with two possible outcomes: A. The application is passed on to the proper domain expert (applies to around 250 applications at each round of applications). B. The application is rejected immediately (applies to around 50 per round).	 C10-13. C10-11.
4. Every now and then, the secretary informs the domain experts that applications are waiting to be assessed.	C10-13.
5. The domain expert looks at the application and the history trail of the applicant, records his assessment and a suggested grant amount.	C20-1, 2, 4 to 6.
6. The other board members look at the application and record their assessment in the same way. When everybody agree, the application is passed on to the secretary.	C20-3 to 5.
7. At the biannual board meeting, the board decides the other applications. The board members can see the application on-line, including the other member's assessment. Each of them may print overview lists in advance.	C21-1, 2 and 3. C20-8.
8. The secretary records the decisions and sends them to the board members for approval.	C12-1 and 2. C13-1, 2 and 3. Entire C22.
9. The secretary sends letters of acceptance or rejection to the applicants.	C13-11 and 12.
10. The applicant sends supplementary documents, e.g. proof of admittance to the foreign university applied for, and confirmation that grants haven't been received from somewhere else too.	C41-11.
11. The secretary approves the documentation.	C10-32.