Information Systems 01PDWOV

2 February 2022

Books, notes are not allowed. Write only on these sheets.

Paper review

Scientific papers published in prestigious scientific journals undergo a well defined revision process, called double blind revision process. The author of the paper sends her paper to the journal. Here the paper is assigned to an editor. The editor selects three reviewers, and sends the paper to them. The reviewers must not know the name of the other reviewers, the author does not know the names of the reviewers, and the reviewers do not know the name of the paper's authors. Each reviewer reads the paper and sends back to the editor observations, questions, requests to clarify and so on. Further, each reviewer judges the paper as 'accept', 'accept with minor revision', 'accept with major revision', 'reject'. The editor collects the three revisions, makes a decision about the paper (accept, accept with major revision, etc), and sends back all to the author. The author, upon reception of the revisions, may decide to retire the paper, or revise it and resend. If the paper is revised and resent to the journal, the same cycle is repeated (select reviewers, send paper, receive revisions etc). Usually the process ends after two cycles of revision, either with the acceptance and publication of the paper, or with rejection of the paper.

AS IS process
Email is used throughout the process. The author sends the paper as a PDF file attached to an email. The editor sends the paper to the reviewers via email. Reviewers send back their revisions as text in emails. The editor summarizes the revisions in one email to be sent back to the author.

TO BE process
Use of email is limited to notifications of events (new paper is submitted, revision is available, etc). A web site is built, with a paper repository, and a front end to manage it. Editors, reviewers, authors have an account on the web site. The author uploads the paper on the repository, reviewers access the paper from the repository, reviewers upload their reviews, author accesses the reviews on the repository.

In the following model the TO BE situation.

1   Organizational model: list roles or organizational units involved

Journal
   Editor (can also be external to Journal)
        Admin
Author
Reviewer (typically external to organization Journal)

2aProcesses. List the key processes. For each process define name, input, output, description

| Process name	input	output	Description	OU involved
Registration (author or reviewer)	(author or reviewer without account)	Account created	Account on web site is created	journal
Review of paper	Paper from author	Decision on paper	Editor receives paper, finds 3 reviewers, contacts them requesting a review, reviewers do review, editor collects reviews and makes decision about paper, notifies author	Editor, author, reviewer

2b Processes.　Define a BPMN process model for the process(es) listed in the previous question

The submission / revision process can be repeated many times, this is modeled in the BPMN by restarting the process by the initial state, on a new revision of the paper (see attribute Paper.revisonNumber on the conceptual diagram) . Further, some details are not considered (reviewer could not agree in doing the review, reviewer could be late and needs to be reminded)
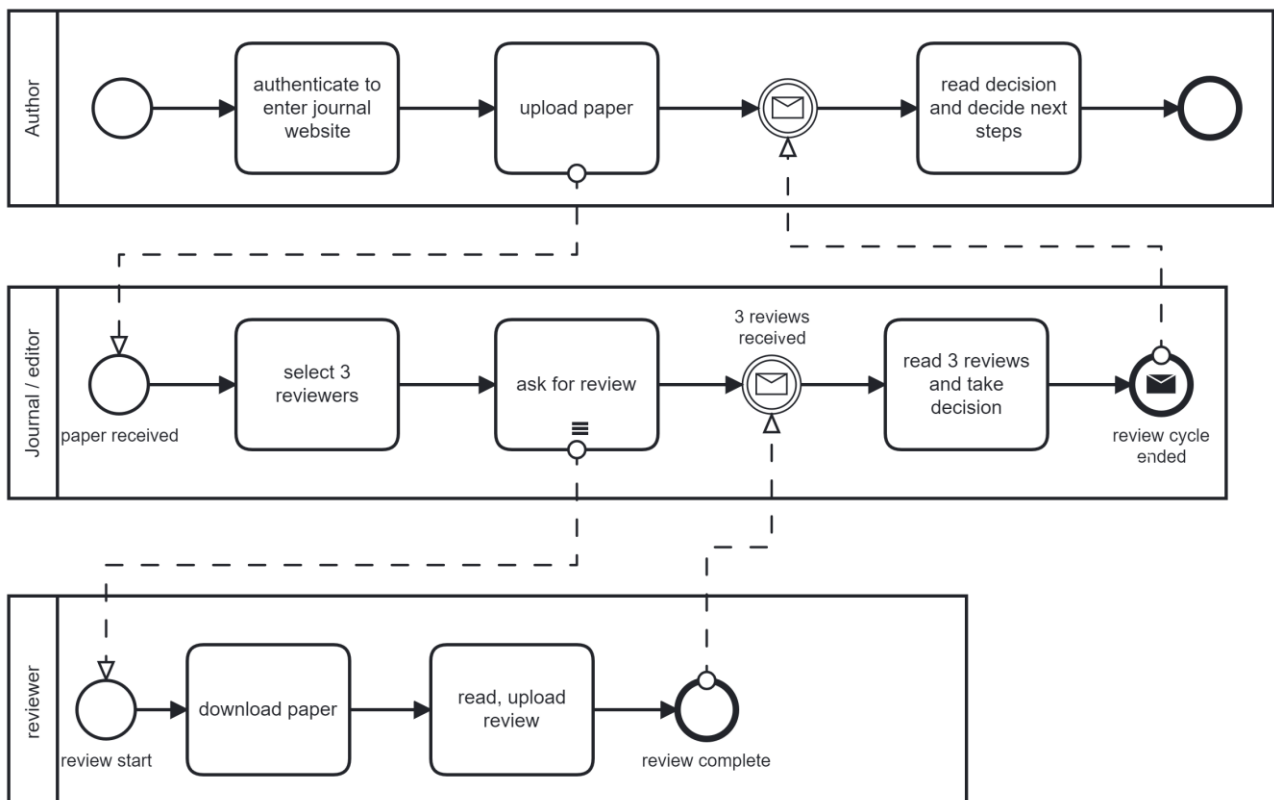
2c Conceptual model.   Describe key concepts and their relationships using UML class diagram

Reviewer editor author are roles and not distinct classes. In fact a person can be author of a paper and reviewer for another paper, person can be editor of several papers, but could also send a paper as author, or be reviewer of other papers.
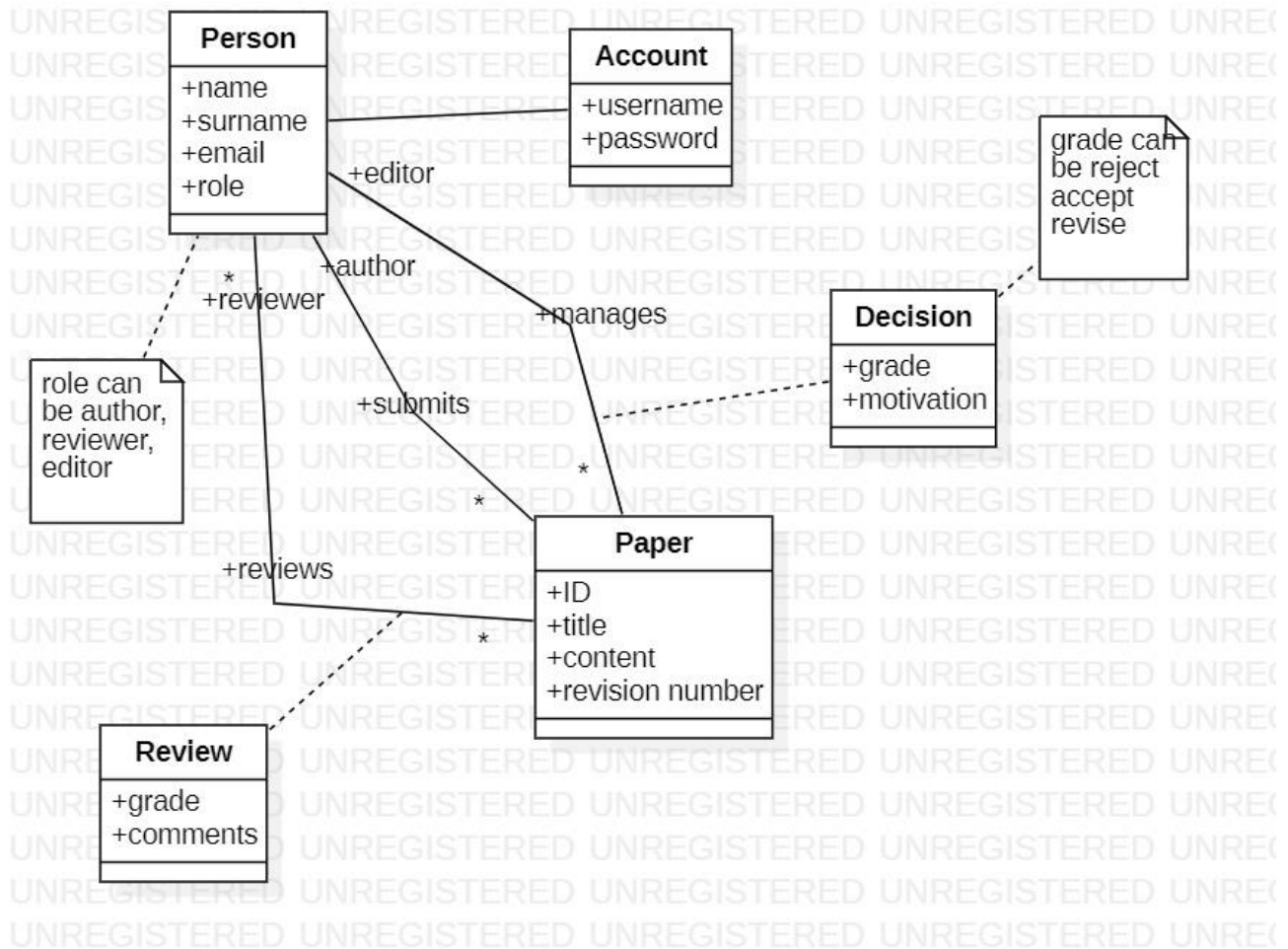
3-a IT Model / Technological model: describe the hardware architecture of the system
(use **UML deployment diagram**)
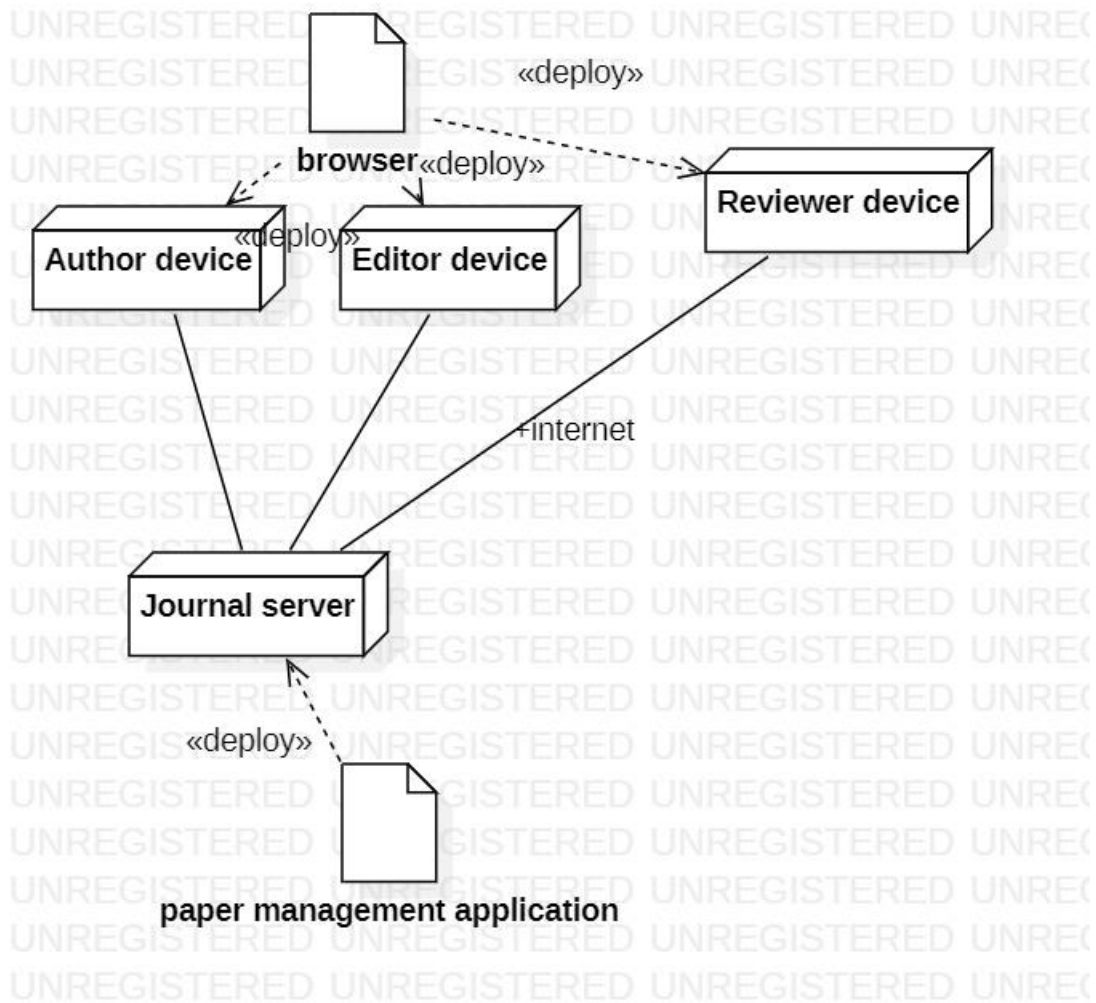
3-b Business rule: define (in English, or formally) at least one business rule for the process

-Papers need at least 3 reviews
-If editor submits a paper, should not be editor of his paper
-the author must not know the names of the reviewers

5   Define the KPIs, considering these high level business goals (or CSF), CSF1 maximum convenience for users (authors, editors, reviewers), CSF2 cost effectiveness for the organization.. If needed, define also indicators that are not KPIs.

CSF name	KPI Category (General, cost ..)	KPI Name	KPI Description	Unit of measure
	General, input volume	NP	Number of paper submissions per year Number of submissions is way larger than number of papers published	
		NR	Number of reviews == NP * 3	
	Human Resources	NRV	Number of reviewers, should be consistent with NR	
	Service	LT	Lead time for a review cycle, from event 'paper received' to event ' review cycle complete'	Days
		LT review	Lead time for completion of one review, from 'review start' to 'review complete'	Days
		LT all reviews	Max (LT review)	Days
	Efficiency	UC	Unit cost of review = f(effort review + effort editor + cost infrastructure) Editors and reviewers usually are voluntaries in scientific journals, so UC is in fact zero	euro
		Effort review	Effort for doing one review	ph
		Effort editor	Effort for selecting reviewers, contacting them, summarizing reviews and making decision	ph
		Cost infrastructure	email (as is) vs repository and web application	euro
	quality	defectivity	Defects in one review cycle Defect can be: lost review request, lost review (because of email failures), wrong paper version considered (by reviewer, by editor) Quality of the papers themselves (possibly monitored by % of rejected papers / NP) is not meaningful here, because it depends on the papers (not on the review process) Similarly, the quality of reviews (possibly monitored by % of wrong decisions – papers accepted that should have been rejected, and	

| | | | papers rejected that should have been accepted) is not considered, because it depends on the skills and dedication of editors and reviewers, not on the review process itself. Further, the % of wrong decisions is nearly impossible to compute | |
| | | satisfaction | Satisfaction level of reviewer / editor / author about the review process, to be collected via a questionnaire | |

Not a kpi. Control on the review process. Capability of knowing, for each paper submitted, the status

6   Compare the previous and the current situation, using the KPIs defined above

KPI	AS IS	TO BE
NP,NR, NRV		No change
LT		No change, or slight reduction thanks to increased control on the review process and lower defectivity
LT review		Possibly reduced
UC		Could increase, due to cost of infrastructure
Effort editor		May decrease, thanks to increased control on the review process and lower defectivity
Effort reviewer		No change
Cost infrastructure	low	Higher (web application to manage repository and process)
Defectivity		Should decrease, lower dependance on email errors, and no more defects due to wrong paper version considered
Satisfaction		Should increase
Control on the review process	Very difficult, state of a review process instance (which paper version has or does not have attached reviews and decision) has to be reconstructed by reading several emails	Easy, state is managed by the server app, state of each paper is always available with no effort by the editor, all LTs computed automatically. Reminders to late reviewers can be sent automatically

The process does not change (the editor is needed in TOBE), only the technology supporting it (change of first order).

LT is the essential KPI, scientific journals compete among them based on this measure. As discussed above, decreasing defectivity and increasing controllability should reduce LT.

7 Considering the retail company and the infrastructure it has to build or acquire for the TO BE, define the software functions needed

Process /Activity	Software function(s) needed
authenticate	Define account, Define authorizations for account and role Login (authenticate and authorize), log out
Upload paper	Upload paper, increase paper version, attach paper to author account, attach review to editor account
Select reviewer	Browse list of reviewers, search list of reviewers, select reviewer
Ask for review	Define review, attach review to paper, notify reviewer
Download paper	Accept / reject review, show paper versions, select paper version, download paper,
Upload review	Fill in review, define grade, upload review, notify editor
Read 3 reviews	Show all reviews attached to paper, create decision, attach decision to paper, define grade, close decision, notify author

8 Considering the comparison in point 6, summarize pros and cons for the actors in the TO BE situation (add actors if needed)

	PROS	CONS
author	Better control (state of her paper, reviews and decisions are easily available by accessing the server app)	Need to define account
Editor	Better control over the process (view all papers under her supervision, view their versions and attached reviews and decisions, view reviewers and their timeliness)	
reviewer	Better control (state of papers reviewed, reviews and decisions are easily available by accessing the server app)	Need to define account
journal	Increase in control over the process, and as a consequence lower defectivity and lower LT	Requires investment in web application

Again, the main advantage of the TO BE is the availability of all information about papers and related reviews and decision, including the complete history over several revisions, through the server application, instead of scattered over several emails.

9 According to the Anthony's model, what characterizes the operational level? Make some examples

See slides
10 What is the BOM or 'Bill of Materials'

See slides

11 In the context of the BMC, describe the 'product innovation' business model

See slides

12 Describe the 'Dunning Krueger' effect

See slides

13 In the context of change management, describe the Gleicher formula.

See slides