

## ***Interactive comment on “An Offline-Online WebGIS Android Application for Fast Data Acquisition of Landslide Hazard and Risk” by Roya Olyazadeh et al.***

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Dear Reviewer, We would like to thank you for reviewing this paper, your time and effort for corrections and suggestions. Attached "Supplement: nhess-2016-267-supplement.pdf" you can find our answers to your comments. Base on your request, we have updated the section on technology and architecture. We also have updated some figures such as data model and flowchart for more clarification.

Best Regards, On behalf of all Authors, Roya Olyazadeh

Specific remarks: Page 1 line 2: remove the semicolon. Updated P1 l14: what do you mean by “complications subject to accessibility and terrain”? One of the advantages

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of remote sensing is indeed to overcome accessibility issues. RS are mostly used because of the accessibility and terrain. So of course that is an advantage of RS. P1 I16: add “the” before “implementation”. Updated P1 I19: replace “for instance” with “such as”. Updated P1 I20: remove “of”. Also (here and elsewhere), PostgreSQL and PostGIS are cited like two separated product. It is better to report PostgreSQL as the real DBMS and PostGIS as its plugin for spatial database management. Updated P2 I2, I7, I8, I9 etc: when citing references do not put an empty space before comma and do not use comma before “et al.” (here and elsewhere in the text). The references were added using REFERENCES in word 2010. We have updated them all according to NHSS. P2 I7: “selection of techniques relies on”. Not clear, please rephrase. Updated P2 I11: replace “are” with “is”. Updated P2 I15: replace “have long” with “require a long”. Updated P2 I16: check English. Updated “Landslides are often small, with a high frequency of occurrence and located in remote areas which are difficult to access.” P2 I18: replace “disadvantages” with “issues/problems”. Updated P3 I7: improvement with respect to what? Please clarify in the text. Updated as follows: “Data management improvement in hazard event mapping and storage using new technologies such as Postgis and Geoserver.” P3 I23: when references are cited within a sentence only the dates must be in the brackets. Updated P4 I15: Another methodology that should be referenced in this paragraph is data mining from newspapers. This figure related to techniques for landslide data acquisition and section has been removed from the paper as requested by the previous reviewer. P5 I12: BGS Sigma is reported as 2013 in the reference list and further in the text. Updated P6 I4-5: these two sentences are not connected with the following of the paragraph. We have deleted those and we also updated the methodology with figure 3. P8 I29: the data transfer system between offline program and online component is not clear. Is it a normal web application? the data sending is automated or the user must select it manually from his device? We have updated it. The transfer is done by uploading Geojson files from android app to the online version. The online version is a normal web-mobile browser. The data are not being sent to the server automatically and the user has to upload those Geojson files

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from the device to the online system. The upload is available in the online version and can be done by one click. P8 I35: It's not clear the role and the position of GeoServer and PostGIS DB (are they in a remote server? in the same server or in two separated servers? maybe a figure about System Architecture could help). Then it's not clear if GeoServer is used only as map server or if it is used also to receive the GeoJSON made from the mobile app (through native REST API or WFS protocol) or if this is done by another component connected to PostgreSQL/PostGIS. Yes, our server was based in Geneva and we were working in Nepal. We used one server however, Postgis and GeoServer, which were installed separately in our system. Geoserver is used as map server and to download the final data into shpfiles. We have updated the technology section with more detailed information.

P9 I5: Is there a technical reason to use two different DBMS (MySQL and PostgreSQL) in the same project? (again a System Architecture figure could help). Yes, we used MySQL for user management which was a ready open source package called User-Cake, So we did not have to program and deal with user management separately and for spatial database we used Postgis which is under Postgres database. As mentioned in the text: P9 I5 6 : MySQL database (MySQL, 2015) and UserCake library (UserCake, 2015) improve the user management and authentication. P8 I33 34 : PostgreSQL 9.4 (PostgreSQL, 2015) and Postgis 2.1 (PostGIS, 2015) for spatial database management. P11 I7: replace "out team" with "the authors". Updated. P12 I7-8: this sentence it unclear. Please rephrase. Updated: The advantage of mobile-GIS is increased in relation to the existence of landslides and distribution of landslide areas. P12 I14: in the centre of what? In the center of our case study, Pokhara Lake Watershed. We have updated the text accordingly. P17 I3: here you have started the description of ROOMA concerning its database and then you talk about the test site. Before you start talking about the test site finish the description of ROOMA, talking about the offline drawing tool, the possibility to upload data and to export data in GIS format. We have updated accordingly. P17 I12-13: please be more conservative in this sentence, i.e. instead of stating that ROOMA will increase the quality of landslide maps, state that this it its

aim, or that it provides a contribution in that direction. Updated: “ROOMA tool aims to increase the quality . . . . “ P17 l14-15: if this paper accomplishes something or not should be left to the reader to decide. Furthermore here you say that the paper accomplishes something that is still to be developed. Please change this sentence. Updated Figure 2: what do you mean with “temporal”? The state of activity? Also, in the central box remove the capital letter from “L” in “Slope”. This refers to landslide maps for different time periods. It is a cited figure. We have updated “Slope”. Figure 3: this figure should be changed into a table. However in its present form it is very confused and confusing. Most notably, the second column should show names of techniques but also reports “frequency”, “earthquakes” and others. Also, what are “existing data”? This figure is removed from the paper and it has replaced with the following figure to give a better idea of how this application can work.

Figure 4: why in the landslide information are also here (left box) even though this concerns information concerning the elements at risk? Are not landslide information already contained in the landslide database (figure 3)? Please explain. We have removed figure 3 and 4 as also requested by reviewer 1 and we updated it with a data model. Previous figure 4 was to show how the database could be used in our server by separating spatial and non-spatial data. We also updated the element at risk paragraph and added it to a previous caption.

Figure 10: in the caption replace “so many” with “several”. Updated as requested Figure 14: please add what is on the Y axis. Also the subdivision of a column between “feature” and “damage” is unclear. What do you mean by feature? This must be better explained. The Y axis is number of Landslides, we have added it accordingly to the figure. Features are for each landslide, for example 56 landslides occurred in forests and of these, 44 damaged the forest (red = Damage). We also added more description for clarity in the figure. We have updated the figure as follows:

Table 1: It is not clear if the fields that you report here represent all the possible entries of your App or if there are just some reported as examples. There are the possible

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entries for our app. We also added the data model in the new version for more clarity.

In the first case I suggest to add the actual interface of your App showing how filling in the landslide database works. Instead of “numbers of landslides” state “progressive identification number of the landslide”. Also, why is it written “initiation” within the types of movements? Filling the landslide database is conducted in mobile form (Table1). We will update the interface figure 6 by adding this form to the figure. We have removed initiation from types of movements.

Please also note the supplement to this comment:

<http://www.nat-hazards-earth-syst-sci-discuss.net/nhess-2016-267/nhess-2016-267-AC2-supplement.pdf>

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Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., doi:10.5194/nhess-2016-267, 2016.

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Figure 3: this figure should be changed into a table. However in its present form it is very confused and confusing. Most notably, the second column should show names of techniques but also reports "frequency", "earthquakes" and others. Also, what are "existing data"?

This figure is removed from the paper and it has replaced with the following figure to give a better idea of how this application can work.

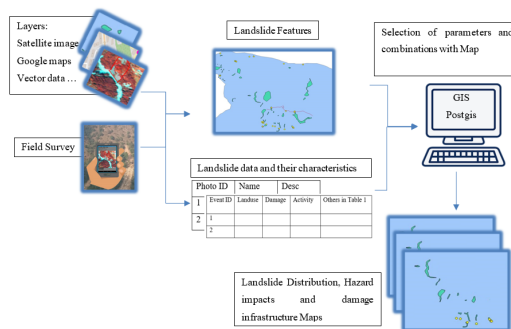


Figure 3: Workflow of ROOMA

Fig. 1.

Figure 4: why in the landslide information are also here (left box) even though this concerns information concerning the elements at risk? Are not landslide information already contained in the landslide database (figure 3)? Please explain.

We have removed figure 3 and 4 as also requested by reviewer 1 and we updated it with a data model. Previous figure 4 was to show how the database could be used in our server by separating spatial and non-spatial data. We also updated the element at risk paragraph and added it to a previous caption.

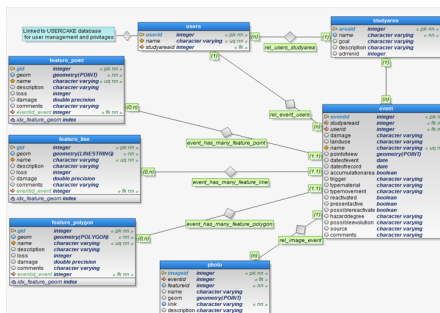


Figure 4 Data model of ROOMA: Database is automatically created from Geojon-txt files which have been uploaded into online version of ROOMA.

Fig. 2.

In the first case I suggest to add the actual interface of your App showing how filling in the landslide database works. Instead of "numbers of landslides" state "progressive identification number of the landslide". Also, why is it written "initiation" within the types of movements?

Filling the landslide database is conducted in mobile form (Table1). We will update the interface figure 6 by adding this form to the figure. We have removed initiation from types of movements.

The screenshot shows a mobile application interface for recording landslide data. The interface is split into two main sections: a data entry form on the left and a satellite map on the right.

**Data Entry Form (Left):**

- Name of the event:
- Date of event: 01/01/2017
- Date of record: 01/01/2017
- Type of Landslide:
- Material: Earth
- Movement: Slide
- Landslide Features: Earthan
- Landslide Damage: Administrative Building
- Landslide Trigger: Earthquake
- Reactivated?: Yes
- Pressure active?: Yes
- Possibility of reactivation: Yes
- Hazard Degree: No Hazard
- Possible Evènements: Lip
- References:
- Comments:
- Buttons: Save, Close

**Satellite Map (Right):**

- Shows a satellite view of a landscape with a red polygon highlighting a specific area of interest.
- Map controls: A vertical toolbar on the right side of the map includes icons for zooming in/out, panning, and other navigation functions.
- Map information: A small box at the bottom left of the map displays coordinates: Longitude: 10.000000, Latitude: 10.000000, Altitude: 11.

Figure 6: Offline Component with a satellite image as a background: Geolocation (Geo), Step Geolocation (ST), Show all the attributes in a pop-up window (Po), Reset the map (RE), Save as GeoJSON-TXT (SV) by filling the green form.

Fig. 3.



Figure 14: please add what is on the Y axis. Also the subdivision of a column between "feature" and "damage" is unclear. What do you mean by feature? This must be better explained.

The Y axis is number of Landslides, we have added it accordingly to the figure. Features are for each landslide, for example 56 landslides occurred in forests and of these, 44 damaged the forest (red = Damage). We also added more description for clarity in the figure. We have updated the figure as follows:

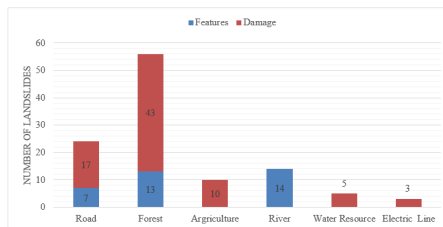


Figure 14: Relationship between features and landslides damage: for example 56 landslides were happened in forest and 43 out of 56 damaged the forest (Red = Damage).

Fig. 4.