



Supplement of

Smartphone applications for communicating avalanche risk information – a review of existing practices

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Supplement: Additional information

Table S1: Additional information gathered on the smartphone applications, either through the interviews or by using the apps, but that are not of direct use in the paper. The apps are referred to with an ID Number: 1. *Avalanche Canada*, 2. *Utah Avalanche Center*, 3. *Avalanche Forecast*, 4. *White Risk*, 5. *Varsom* and 6. *SnowSafe*.

INFORMATION	OPTIONS	APPS ID NUMBER
Validity period of the bulletin	Explicit time span	1
	Time to the next bulletin	4, 5
	No (Issuing time of the current bulletin)	2, 3, 6
Spatial coverage	Whole country (in practice only the Alps)	4
	Most exposed and vulnerable regions	1, 5
	Most exposed and vulnerable regions + by mountain ranges	2
	Several zones of different countries	6 (full Austria, Bavaria and Slovakian mountains), 3s (Canadian and American Rockies)
Terminology for elevation range	“under/above the limit of the forest”	6
	below treeline, treeline, alpine	1,
	Flexible elevation range according to avalanche problem type (e.g. wind slabs over 500 m.a.s.l)	5
	By avalanche prone area (e.g. approximately above 2200m)	4
Additional visual means	Interactive tabs for risk management tools and knowledge content	4
	Access to traffic pictures	2
	Upload of pictures from users possible	1
Possible feedback	Date, time, location, skiing conditions (amazing, good, ok or terrible), snow conditions (crusty, deep powder, hard, heavy, powder, wet or wind affected), type of riding slopes (alpine slopes, convex slopes, cut-blocks, dense trees, mellow slopes, open trees, steep slopes or sunny slopes), types of slopes that were avoided (same options than the previous point minus dense trees and mellow slopes), weather conditions (cloudy, cold, foggy, stormy, sunny, warm, wet or windy), avalanche	1

	conditions (slab avalanches today or yesterday, whumping or drum-like sounds or shooting cracks, 30cm+ of new snow or significant drifting or rain in the last 48h hours, or rapid temperature rise to near zero degrees or wet surface snow)	
	danger signs, avalanches, weather, snowpack, snow profiles and possibility to upload pictures	regObs (twin app of 5)
Language	English	2, 1, 3
	Avalanche problems in English, the rest in Norwegian	5
	Danger level in English, the rest in German or Slovakian	6
	3 of the 4 Swiss official languages i.e. German, French, and Italian as well as English.	4
Future update content	Introduce or upgrade the possibility for users to report observations or incidents	6, 4, 2, 1
	enable users to store the forecast in order to view it where there is no internet coverage	1
Operating system	IOS (Apple Inc.)	All apps
	Android (Google Inc.)	4, 1, 6, 3
	Possible on Android but website version	5
Standard for data collection from warning center*	CAAML	6, 3
	Other standard/directly from the websites	3
Funding	Fully public	5
	Public completed by corporate or NGO funds	1, 4
	Financed by the developer	6, 3
Regulation	No regulation to follow	1, 4, 6, 2,5
	Agreement on the use of data with one warning service center	3
Terms of Use/Disclaimer	Mainly: warning that completeness, accuracy and/or precision of information is not guaranteed, mention that the apps are not liable for potential damages and losses Often: bulletin does not replace practical training	5 of the six app

*Only for apps that are not developed by warning services