

Mobile Data Collection in Humanitarian Context (NOMAD)

Analyses of existing mobile data collection against the requirement of
organization working in the humanitarian context

Compiled by CartONG



Consortium NOMAD:

IMMAP

CartONG

WFP (World Food Programme)

MEDES

Auvea

ACAPS

Introduction

Humanitarian operations often take place in areas with poor information, and when information is available, it is often outdated or becomes obsolete due to the crisis. The notion of geographical location is fundamental in nearly all sectors of information regarding humanitarian operations. Satellite, mobile phones and GPS-enabled PDA's have recently become more than just communication devices and have been piloted successfully in humanitarian operations, though very few organizations have standard procedures in place for all their data needs.

The NOMAD project (Humanitarian operations mobile acquisition of data) was created through a partnership between the following organisations: IMMAP, WFP, MEDES, AUVVA and CartONG. It is financed by Centre National d'Etudes Spatiales (CNES). Its main objective is to develop a service enabling humanitarian organisations not only to collect geo-referenced data with GPS-PDA devices, but also to submit and synchronise the data immediately even from the most remote locations thanks to satellite communication.

Analyses of the Sector needs

This research is comprised of a survey that started on 08/11/2010, combined with interviews and web research that were conducted in October 2010 to December 2010.

Survey distribution:

- ✓ Invitation sent out to 555 individuals from the CartONG Newsletter subscriber's list
- ✓ Crisis Mappers mailing list
- ✓ Included in SIG-la-lettre newsletter
- ✓ Posted on the project webpages www.humanitarian-nomad.org, GeoRezo, ALNAP and the GoogleGroup of MobileActive. (GoogleGroup, SIG-la-lettre and ALNAP were posted late - last week of November - and therefore have not contributed much to the number of responses.)

With a conservative estimate of 500 invited recipients, the *survey response rate* is at 8.4%, as 42 organizations answered the questionnaire.

In the process of designing and refining this complete mobile data collection system, the aim was to involve all stakeholders in the humanitarian context and considered the following aspects;

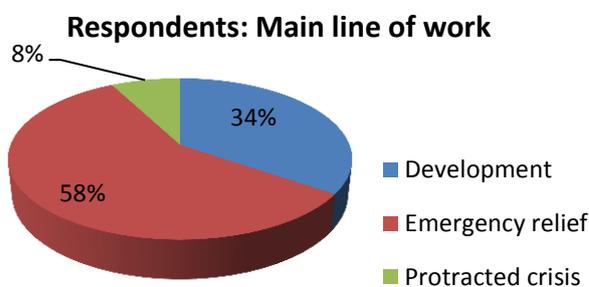
- What is the current type or system of data collection (paper based, desktop or mobile)
- Limitation of the currently used system
- What type of data is to be collected

- How this information is translated into an electronic format
- Where the data is collected and how the system complement the work flow of data capturer
- How the data collection is managed
- How the data is transferred or synchronized
- How the data is verified/updated and analyzed

Key Findings from the survey and secondary research

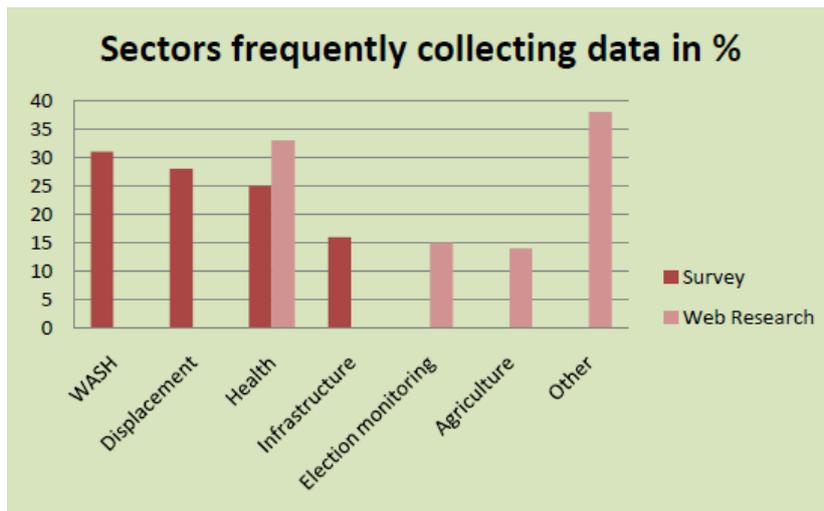
It was clearly noted that all organizations collect and analyse different types of information. The survey in all cases represents well-defined objectives to cover the interests of the organization. This makes the use of a common data collection application by more than one entity difficult.

The following graph shows the main area in which the responding organisation is active. Of those who answered *Emergency relief* as first priority, 40% selected *Protracted crisis* as second. Of those who primarily work in a *Development* context, 44% also state *Emergency relief* as their second area of work.



About 53% of the respondents are currently collecting data using *paper form*, mainly because it is assumed to be *cheaper* and *requires less training* for collectors. One organisation also pointed out that it is *safer to use paper* and *technological limitations in remote areas* as well as *faster deployment with standardized paper forms* were cited by two others. On the other hand, 78 % of the respondents using paper require the data to be recorded in the system *within two days*, which can be a challenging undertaking for data entry staff.

The chart below shows how frequently information is collected by sector: *WASH* 31%; *Displacement* 28%; *Health* 25%; *Infrastructure* 16%. Based on web research [1]; *Health, Education and Emergency Response* were the fields where mobile data technology with PDA's was predominantly applied. The *Health* sector also played a major role in mobile data collection projects currently being carried out with 33%, followed by *Election monitoring* (15%) and *Agriculture* (14%). [5].



Sampling

Respondents indicated the survey should be able to equally gather information related to

- o *an individual*
- o *a household*
- o *infrastructure*
- o *a community* (either by a geographical area or a group of people having something in common i.e. a group of people using the same health centre)

(Household level and infrastructure mentioned slightly more frequently than the rest)

Creation of questionnaires

From the census we realize that more than 80% of the surveys include *between 1 and 50 questions*.

- o *The majority of organizations use surveys comprising between 10 and 20 questions*
- o *36% use 20 to 50 questions.*
- o *Some detailed health related or cross-sectoral assessments conduct surveys with more than 100 questions, for instance after a disaster.*

The average number of quantitative questions was confirmed to be just over 40. Both *one-time surveys* and *reoccurring assessments* are equally important and used by responding organizations.

Translating surveys into electronic forms

The majority of respondents are using paper forms for data collection, though **the data of more than 70% of the paper form surveys is then entered in electronic format.**

- o *69% of the respondents record into a local database* (Excel or Access)
- o *18% insert it into an online database.*
- o *One organisation entered directly online, others use whatever method suits best in the current context.*

28% have already embarked on some form of mobile data collection, out of which 44% are interested in collecting data using mobile technology mainly to do *GPS tracking* and to save *time and resources* when analyzing the data. 9% of the organizations have *neither started nor are interested* in using mobile phone data collection with one organisation offering *resource limitations* and *problematic connections* as reasons.

Cost

In consequence, almost half perceive *the cost to be an issue* for procurement of mobile technology. A few also mentioned that it is very difficult *to justify procurement* of such a tool for a one time survey or that the *budget allocated for surveys in general are very low* in comparison with other projects.

Renting does not seem to be the best option, because it is assumed that the transport cost, delay, rent and other costs would not be justifiable in time. Only 13% would be interested in this. Renting can be potentially interesting for those conducting a one-time survey. For those who regularly conduct surveys, *10,000 Euros* is considered to be the *maximum amount* they will be ready to invest.

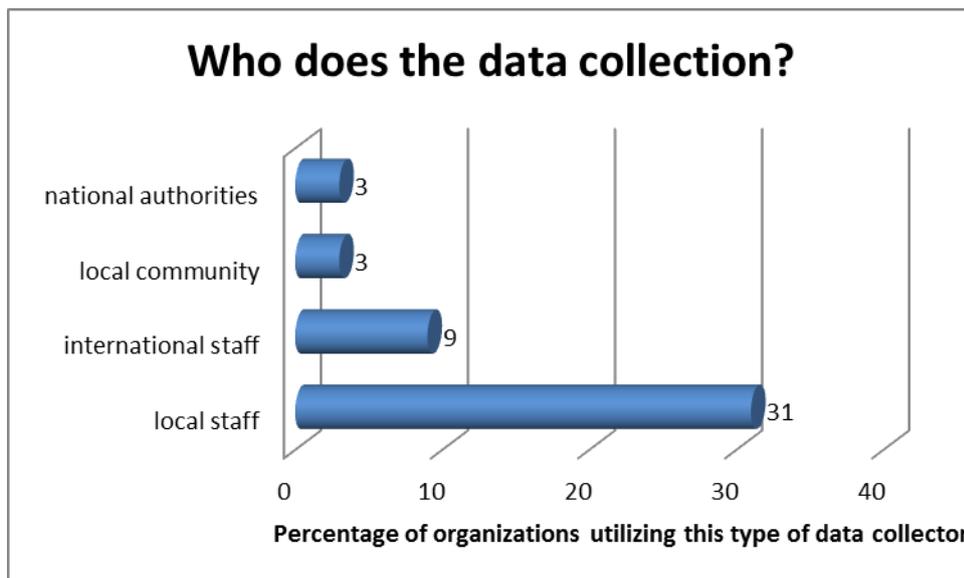
Technology

Among those currently using mobile data collection, GPS enabled PDA are the most popular – HP brand was the most cited. *Windows Mobile* was the operating system utilized by the majority, with *Android technology* being relatively new. However, 14% of related researched web contents and 11% of the current projects are using Android technology [5].

Most of the organizations do not seem to have the adequate resources for the *translation of paper forms into electronic*, as professional assistance was required. Almost 70% out of the organisations which have embarked on using mobile data collection have had support with the translation of the electronic form, also reflected in the secondary source [1]. Only one organisation responded that the survey was *newly created* for the mobile data collection; all others had not changed the structure of the survey. However, in the secondary sources [6, 1] it was mentioned that with the use of mobile data collection technologies, the surveys became more rigorous, abandoning many free text level fields. This was seen as a positive step towards streamlining the data collection.

Training surveyors

One reason paper form surveys are still used is because it is assumed that training is easier with paper than using additional new technology. An *average of 65 staff* received *12 hours* of training and 16% of the respondents also mentioned that they have made *provisions for future training*.



Training for data collectors is usually provided *in-house*, though almost 10% of the respondents say that they hire someone *external* to conduct trainings. Training sessions are predominantly held for local staff, followed by international staff; this mirrors the situation of the data collectors.

Training plays a crucial role in the data collection process, not only relating to the questionnaire but also to clear instructions on how to use technology and conduct interviews, focus groups and other data collection activities – some organizations have also provided more training on thematic groups and identification of sources [1]. The same source also reports that when using external staff (from an implementing partner or other organization), additional training is also provided on the role and

mandate of the organization and is mainly done internally. It is estimated that *additional training needs to cover the technology* is around 0.5 – 1 day [6].

One particular respondent, having already the technology implemented, realized that the system is not used to its potential and would now like to enhance their staff's capacity rather than invest in new systems.

Those not providing training use shorter, self-explanatory questionnaires. By ensuring that all definitions and possible responses are incorporated in the questionnaire these organizations limit possible mistakes and misunderstandings.

None of the surveyed and interviewed organizations engage professional surveyors rather than use available local resources. To ensure the quality of the survey

when there are not sufficient resources for local staff training on new technologies, organizations opt for paper forms.

Conducting the survey

Most of the organizations that participated in this survey do understand the importance of capturing *GPS data* for mapping and tracking purposes. Contrarily, other *multimedia data* do not seem to be considered as important, although few do require this feature for visual interpretation and to use the data as a reference in the future. According to a secondary source [1], out of those organizations who answered the question concerning the location of the mobile technology, half responded that their equipment is *located in the field* while the other half confirmed that their equipment is either at the *HQ or regional level*. Out of the very few answers received on the difficulty of shipping the equipment to field, 75% claimed that *shipping* is not difficult. [In the course of the NOMAD pilot as well as other projects CartONG had been involved in, the shipping and the clearing of equipment at customs has proven to be difficult in some countries.]

Synchronizing data

While there is a range of tools for data synchronization and solutions such as satellites, GSM, and GPRS among others, more than half of the organizations described communication as being poor in the field. They do not find it necessary to synchronize data at field level. It is unclear whether this is due to the lack of the available technology or that the technology is not put in place because synchronization is not considered important.

According to a secondary source, even when the necessary technical tools are in use at the field level, the synchronization is not done during the field work but rather in the end of the day / week / month. This seems to indicate that immediate synchronization is not a priority that would justify

constant use of costly technology. Limiting the synchronization to certain moments is not considered to have a negative impact on the use of data but can save already limited resources. The sectors which more often seem to have regular survey schedules following a pre-set frequency are Health and Agriculture. There are slightly more surveys which are conducted on a weekly basis than a monthly basis [5].

- *One of the organizations interviewed on the phone declared that since switching to using mobile phones or PDA's their data transfer time has considerably shortened.*
- *Two organizations have already used satellite technology for transmitting data, and one is contemplating using it, should it become more economical and reliable.*

Verifying and analysing data

About 30 % of the organizations use an *assessment tool for data verification*. This is being done by triangulation, comparison of data from several sources, random quality checks and by reviewing improbable data.

Only 13% of the organisations have a system in place to *protect sensitive data*. Of those, one organization claims that they do not have sensitive data while one other reports on technical limitations.

Methods used to protect sensitive data include:

- *encryption*
- *strengthen their data management policy*
- *restrict access*
- *simply separate the sensitive data to another database*

With the exception of one organization, all store their data in a *local machine* rather than *on-line*, mainly using *Access*. When crossing this information with the previously treated issue of training, it can be concluded that *Access* is the easiest tool to manage and analyse data. There are two organisations citing *Oracle* and one *PostGreSQL* as their database of choice.

The vast majority of the respondents are not using an automatic reporting tool but would be interested in a system that would enable automatic reporting. Basic charts and cross-tabulations were specifically mentioned as being of interest.

Conclusion

The **costs** related to different stages of a survey seem to limit organizations' possibilities to use new technologies, which require additional **training** and increased communication costs. However, studies have shown that the operational costs of mobile data collection are **lower than its paper based counterpart**, especially if the costs of the devices can be set against several assessments [1,6,7]. For human cost alone, it is estimated that the costs are more than halved by cutting down data entry, especially if it is a rigorous survey requiring double entry to reduce data entry errors [6,7]. Depending on the type of survey, in particular if the free text fields have been reduced, using mobile devices is faster than paper surveys. [7].

Based on the fact that local staff in the field is mainly used for information collection and reporting and their training is done internally, implementation of new technologies would require **enhanced training**, including training of trainers and focal points.

Additional training for covering how to use the mobile phone/PDA devices has been estimated to take 0.5-1 day per survey. However, the cost savings in terms of data entry and improved data quality are enormous and amortize this investment quickly [1,7]. For NOMAD, the type of additional training required needs to be defined further, from using the handhelds to synchronising the data.

Many organisations assume that the **investment both in technical and human resources would be difficult to justify and finance**. **The benefits resulting from the use of mobile data collection, such as immediate data collection and entry leading to saving time and human resources, the possibility of including GPS locations, and immediate analyses, have not yet outweighed the perceived difficulties related to the initial investment**. As can be seen from case studies, especially for organisations conducting many assessments on different levels, the benefits and cost savings are vast since the devices could be reused. A **marketing and outreach strategy** would need to take this into account, gathering and citing more examples of how an investment in the new technologies would pay off financially.

Most of the organizations would see the **benefit of mobile data collection** but **do not have the capacity to fully implement all the involved aspects**, including communication and synchronization, which will therefore require the service to include options *for all training and support aspects* for those organisations which might not have the necessary resources in-house to set up the system.

Automatic reporting has been mentioned as a nice add-on to have. A service including basic reporting tools could therefore be of interest and will certainly assist the marketing.

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