Our Story: Addressing Challenges in Development Contexts for Sustainable Participatory Video

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ABSTRACT

Participatory Video (PV) is emerging as a rich and valuable method for monitoring and evaluating (M & E) projects in the International Development sector. Although shown to be useful for engaging communities within short-term monitoring exercises or promotion, PV in these contexts presents significant complexity and logistical challenges for sustained uptake by Development organizations. In this paper, we present Our Story, a digitally mediated work flow iteratively designed and deployed on initiatives in Indonesia and Namibia. Developed in collaboration with the International Federation of Red Cross and Red Crescent (IFRC), it supports end-to-end PV production in the field, and was specifically developed to make PV a more sustainable tool for monitoring. We discuss and evaluate Our Story, reporting on how by lowering skills barriers for facilitators and leveraging consumer technology, PV can be delivered at scale.

CCS CONCEPTS

• **Human-centered computing** → **Ubiquitous and mobile computing systems and tools**.

KEYWORDS

participatory video, mobile, editing, ICTD

1 INTRODUCTION

Empowering under-served communities to share their voice has been a longstanding concern within the HCI community. From the early days of media production, video has been a method favoured within this area due to its rich narrative, aesthetic, and ability to communicate clearly to a wide range of external stakeholders. With the rise of participatory methodologies, video is now seen as a vital element of many engagements. Indeed, the intersection between ICTD and HCI has historically been a place where such methods were utilised, and early adoption of video for empowering communities in self-representation and self-determination took place [34]. The potential of Participatory Video (PV) to produce vivid narratives and enable communities to tell their own stories meant that these approaches are now considered a valuable method of data collection "for bringing communities together to tell their story and explore solutions" [24]. It has also been used to evaluate humanitarian projects [37] and share lessons learnt with stakeholders at local, national, regional and international levels [36]. In a similar vein, video is becoming a sought-after form of media for increasing the visibility of organizations and communicating more effectively with donors. Indeed, many Non Governmental Organisations (NGOs) have explored the benefits of PV to augment or inform their quantitative data collection methods to better understand challenges in the field, and to better communicate these to donor networks and members within the wider organization. However, despite its potential, project monitoring based on PV is still not common practice.

In this paper we present **Our Story**, a participatory video work flow that responds to the challenges of delivering PV in International Development contexts [29]. Built on an existing open source collaborative video platform, Our Story is designed to provide a sustainable method of deploying PV as a monitoring tool for Development programmes on-the-ground (the field). We describe the specific roadblocks encountered by IFRC in deploying such technologies in the field, specifically through the iterative deployment of Our Story in IFRC partner communities in Berau, Indonesia and Grootfontein, Namibia. Based on observations, participant video outputs and interviews with staff of IFRC, we discuss the long-term sustainability of Our Story to support these types of activities, which are now being deployed across their network. We discuss the wider implications for the Monitoring and Evaluation community (M&E), raising issues around bias and representation of community voice.

2 THE CHALLENGE OF PARTICIPATORY VIDEO IN INTERNATIONAL DEVELOPMENT

Participatory Video is a method previously used by our collaborators, the International Federation of Red Cross and Red Crescent, referred to as IFRC henceforth. They work in over 100 countries around the world. Staff who work in IFRC's local chapters in these countries deal with disasters, emergencies and development work in their local communities. Like all organisations, they face the challenge of monitoring ongoing projects for relating outcomes to goals to inform future work. Previously, they had explored the use of Participatory Video as a valuable method of engaging communities in the monitoring process. Videos provide community feedback on the effectiveness and wider context of the project being undertaken there, and supporting evidence for quantitative data collection. Past deployments were performed in collaboration with external PV consultants, who deliver a 'black box' service - bringing professional video production equipment and conducting the PV process themselves, combining light-touch media literacy training with facilitation by media experts to support communities sharing their voice effectively. Not only is this method very expensive (to cover the consultancy fees, travel and accommodation of PV consultants, workshop materials, equipment hire etc.), it is not used often enough by NGOs due to the resource intensive nature of it: PV exercises often take 2-3 weeks of working with the community. Despite these constraints, the most valuable contribution of PV for the NGO in this context however is in its use for comparison over a longitudinal period. As summarised by one Monitoring Practitioner in the NGO: "...we don't have the money or we can't put in the budget or we can't put in the program and we don't have the capacity..." , added to which, a lack of access to specialist equipment and skills within the NGO prevents them from delivering PV in this way internally. Keenly aware of the value that participation in the video making process could have in the community [36], they approached us to collaborate in developing a work flow that would enable communities to have greater voice in the PV process in line with their previous use of PV, and help them deliver monitoring for sub-groups of the community to map against project objectives.

This would have to be delivered within the core constraints the NGO faces in their quest to find a sustainable solution to conducting PV: deploying to more communities, more often, within the context of continuing financial and logistical pressures; and deploying PV across the network using existing staff and within the current time constraints for monitoring exercises.

3 RELATED WORK

One of the earliest examples of PV emerged in the 1967 work by the people of Fogo island [43] to represent their personal views on key societal issues. Since then, PV has been represented widely across the HCI literature, with a significant focus placed on the role of PV for the 3rd sector. Indeed PV has been found to be valuable in engaging both community members and donors [8] with current issues, vital for securing funding and sustaining development initiatives. When PV is used by NGOs to directly engage communities, such as in project monitoring and evaluation (M&E), it contributes towards organisational learning [41], raising awareness about community needs and experiences, and informing future programming. Furthermore many PV efforts emphasise community screenings as part of the participatory process [13, 35, 50] to promote further discussion and a shared sense of achievement among the community. With the use of digital video tools, this has become an even more powerful method of representing marginalised groups outside of the local context. In fact many organisations (such as International Organization for Migration [32], International Center for Tropical Agriculture [30], International Union for Conservation of Nature [31] and International Federation of Red Cross and Red Crescent Societies [25]), benefit from PV and share outputs on social-media networks such as YouTube for wider outreach.

Current PV Practice

Representative, relevant content created in the local context is key when empowering communities to be agents in their own development [18], and audiovisual content in particularly is useful for engaging communities that have a rich oral tradition, but in which textual literacy might be low [19]. Employing PV can increase participants' technical and media production skills better equipping them for advocacy, and increased self-efficacy [42]. Equally importantly, through the process of discussion and creation, PV can impart a greater

understanding about participants' own situation and how to improve it. While there is a long history of research into video within ICTD [10, 49], much of it focuses on involving community members in only a *subsection* of the PV 'pipeline' (most typically, the stage where content is captured). Often the topic and structure for the video narrative are decided a priori by the facilitators, with the concept of participation applying only to direct representation in the video of community members by being 'giving a voice'. This raises perhaps what is the most contentious issue within the PV discourse: What is the nature of participation within Participatory Video? As such, interpretations vary radically with regard to what degree of control 'participants' should or could have over the various processes required to create a film [43] which represents their community. This often manifests as a perceived trade-off between the production value of the resulting video and the level of participation undertaken to produce the content. Added to which, in the context of monitoring, where accuracy of reporting is highly valued, it is key to ensure that facilitators do not influence the narrative building and story editing processes to "ensure authenticity and ownership while providing the necessary guidance" [45].

In the case of the PV process used by IUCN [31] they engaged participants as voices on camera, representing their stories directly, however without any direct engagement with the story building or editorial decisions made to represent them. In contrast, the PV facilitators Proplaneta [47] engaged community members in scripting and capturing video (supporting participants operating recording equipment themselves), but the editing was done by the external PV consultant with input from two villagers. Alternative examples such as the one of Mistry *et al.* [40] have tried other approaches, preferring to teach the community how to operate complex recording equipment, then leaving it with the community for lengthy periods. On their return, elected individuals from the community work with facilitators to perform some of the editorial tasks on behalf of the group.

When we discuss PV in these contexts, often the process is dependent on the resources available, type of product that an NGO wishes to produce, and more specifically how they interpret and value the degree of participation afforded to stakeholders. From the literature, we can roughly categorise previous efforts into two distinct methodologies:

PV as Knowledge Transfer prioritises the efficacy of video as a medium for learning in resource constrained settings, and the primary concern is in passing information to recipients through an engaging medium. A notable example of this approach is Digital Green [20] which supported the dissemination of video-based agricultural information (which included participants) to small and marginal farmers in India. This pipeline relied on high levels of training for a few

highly literate community members. Similarly, projects such as ProjectingHealth [35] and ViralVCD [44] relied heavily on training a few community members to perform production tasks for content which was disseminated to their peers.

PV as Process however is constructivist in its approach, and is concerned with the process of generating knowledge, acknowledging that opening the process up to stakeholders is inherently valuable. PV pioneers InsightShare [37], are known for their work in this space, where they work directly with local communities, facilitating them to direct, act and edit content using specialist production equipment they supply. This 'engagement first' approach embodies this process based model, in which skills in both technology and media are transferred to participants in order that they engage with the entire pipeline to better voice their own narratives. However, we stress that 'PV as process' is not without its challenges, the foremost of which is the sustainability of such interventions: access to production-quality studios, AV equipment and software have often been seen as barriers to long-term usage of PV [45] and align directly with IFRC's experiences of deploying PV in the field. However, the value of PV as process for longitudinally monitoring communities remains clear.

Supporting Collaborative Video through Technology

The popularity of online media and increased technology and media literacy in recent years has led the emergence of myriad digital tools that support film and video production in the consumer landscape. By leveraging these tools appropriately, we see potential to overcome the significant resource challenges faced by the NGO for PV. Most offerings are targeted at supporting rich individual contributions [1, 6], where focus is placed on supporting individual creative practice through improvements in camera technology and video processing. Consequently, priority is placed on community interaction in terms of content publishing and distribution rather than supporting a collaborative production process.

Within the locative and temporal constraints of live events, tools such as Live Stream and Virtual Director [33] demonstrate the viability of using mobile technology to effectively coordinate non-professionals creating video for a singular output, however these tools approach only one part of the production pipeline. Outside of the live context, tools are becoming available which support collaboration in more of these stages (without the focus on supporting non-professional contributions): Weaverize [5] supports collaborative editing of video content, VideoFrame.io [4] supports collaboration around the post-production process and HITRECORD [23] supports the commissioning and delivery of content from a distributed production team.

As identified by Bulterman *et al.* [12], the criteria for supporting effective and socially engaged content (including in a
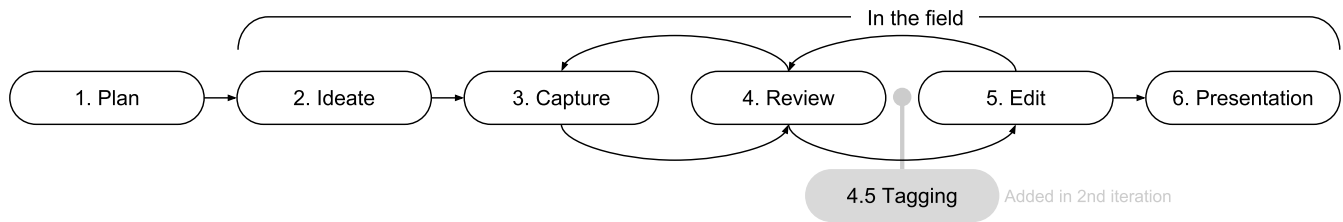
Figure 1: An optimal PV pipeline as suggested by the literature. The Tagging stage was added after the first deployment.

collaborative setting) are varied and complex; factors such as the potential audience, skill of contributor and context of capture all play significant roles in what type of process is best applied. Green *et al.* respond to some of these challenges [21] by supporting a flexible editorial process where potential narratives emerge through curated (but interactive) content produced by participants. This type of output, however, is unsuited for deployment in the ID context. As journalism shares many of the values of PV (such as reducing bias), tools such as UNICEF's uReport [3] give insight into how the creative practice of storytelling can be supported through technology in a reporting (monitoring) context. In one example, Making the News [39], journalists are supported in building creative practice by scaffolding the complex and resource intensive research activities required to investigate stories.

This notion of scaffolding production practice to support delivery by non-professionals is exemplified in platforms such as Bootlegger [9] and Sauce [2] which lower the skills barrier required by participants to contribute high-value content through a clear shot-level commissioning model. Vasilcheko *et al.* [46] then demonstrated that this type of support increases media literacy in a collaborative setting which led to improved production quality of content. The complex nature of the ICTD context precludes any existing solutions being adapted off-the-shelf. However, they do provide a clear basis for the use of consumer technologies and scaffolded production tasks as a viable method of supporting an end-to-end production pipeline, as long as we do not base our expectations of narrative structure and content on cultural conventions [11] and technology usage which emerge from western societies' significant use of video.

4 A TECHNOLOGY PLATFORM FOR PV

From the literature, we see that the processes of delivering PV follow the same set of basic principles (similar to that of professional production), seen in Figure 1. However, each of these stages present unique design challenges for an NGO working in diverse contexts. As highlighted, a sustainable PV pipeline needs to: i) lower the skills barriers for human facilitated processes in the pipeline, to reduce the burden on

human resources, ii) reduce the reliance on specialist technology and software, supporting the engagement of more of the community in the process. Our collaborators are also faced with delivering this process end-to-end in under a week. Furthermore, noting how resource intensive typical PV processes tend to be, a pipeline that can be deployed longitudinally would need to leverage the media literacy of potential participants and NGO members to drive skills transfer amongst the team.

On initial inspection, existing collaborative video tools fulfil both these goals, whilst working to maintain production value and genre conventions. However these tools do not encompass key elements of the pipeline, namely the ideation and collaborative editing stages in a manner which can be facilitated in the field by non-professionals. One such existing tool, the open source Bootlegger collaborative media production platform formed the starting point for Our Story, which consisted of an Android mobile application and server architecture surrounded by a structured work flow customised for this context. It leverages existing consumer hardware (mobile phones) that are available in the field, and scaffolds (some) key production tasks so that non-professionals can create content, without outside intervention. The platform, thus, offers a solution for organisations to collaboratively support the Capture, Review and Editing phases of the video production pipeline for various organisational needs (e.g. an event organiser coordinating a documentary of their event). Furthermore, while existing PV practice approaches editing through education of the community in professional level tools [1], Bootlegger aims to overcome these barriers by supporting specific, but minimal editing features within the App, reducing the amount of technologies and software the community has to interact with. However, Bootlegger has a number of limitations that prevent it from being an effective tool for Development contexts.

In particular, support for the entire video production pipeline on low-end consumer devices is delivered by offloading intensive video related processing to cloud based services, with the byproduct in a reliance on network connection to support

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[1]e.g. Adobe Premier Pro, AVID Everywhere

most production stages. Considering the context of limited connectivity in remote regions, we needed to think about minimising networking requirements. In line with Mahla *et al.*'s recognition of these challenges [38], we significantly updated network delay tolerance and caching, reduced the quality of video previews, and updated the app to work offline during the capture phase. Although supporting the Capture, Review and Editing stages of the pipeline, the Bootlegger work flow presumes that the creator knows what they want to accomplish before starting the process both in terms of content and quantity, thus Our Story needed to support the Ideation phase specifically. Additionally, like most digital media tools, Bootlegger is targeted at western, media and technology literate users, thus changes were required to reduce both the text and iconography literacy burden of the application. Our partners assessed the existing application and identified areas to adjust in response: (i) App was simplified, removed camera flash, filtering of videos, display of additional profile and all on-boarding screens. (ii) Text labels were replaced with iconography, non-critical information display (meta-data) was also reduced and terminology was updated: Shot → Video, Role → Category, Crew → Contributor, Edit → Story, Review → Watch. (iii) Due to concerns over misuse, social media integration was removed for sharing content from within the App and we replaced syndicated log-in providers with transient pseudonymous identities based only on name. Explicit consent screens were removed, and data-protection and privacy guidance included as part of the wider context delivered by IFRC.

5 OUR STORY WORK FLOW

Stage 1: Plan: To reduce the planning overhead involve in organising a specific deployment of PV, Our Story scaffolds many of the logistic and resource constraints (i.e. lists of equipment, identification of staff required), allowing for quicker roll out by IFRC.

Stage 2: Ideate: Constitutes an 'offline' planning process facilitated with the community. Current practice varies, ranging from high-level storytelling to full frame-based storyboarding of videos. In a conventional PV process this is facilitated by consultants with specific media skills, who support the community developing a narrative which they then represent in video. Our Story scaffolds this process, through a sequence of paper-based tasks and materials, drawing on existing participatory monitoring practice using the Most Significant Change (MSC) approach [8] (an approach our collaborators had used extensively in their project monitoring processes) to clearly elicit stories that map to programme outputs, whilst facilitated by non-experts within IFRC.

(1) A scribe is self-selected to annotate a visual representation of events that have occurred within temporal bounds

of IFRC's project. This helps focus the narrative process onto the effect of the program in the community.

(2) In groups self-selected based on the monitoring criteria (e.g. elderly, men, women etc.), 2-3 individual stories are identified based on Step 1, using MSC. A group scribe records these on paper. The group are asked to produce a **recommendation** for change in the community, either as a critique or comment.

(3) Verbal or written consent is obtained from all contributors in line with ethical and media rights release policies of IFRC, and it is clearly explained how the videos will be used, and that they will not be adjusted on leaving the field.

(4) Each group selects three stories to take forward into their group's video.

Stage 3: Capture: In a conventional PV process the capture stage is highly organised based around the use of professional video equipment provided by a consultant. This may involve some training on the equipment, and subsequent hands-on facilitation by the team to support the community in telling their stories. Removing reliance on specialist equipment such as cameras, tripods, lights and audio recorders would allow more of the community to be engaged in the recording process. Bootlegger provides a mobile application which lowers the skill barrier for contributors supporting them in producing high quality content. It does this by 'commissioning' individual videos to a user, showing them a short description and visual overlay of the expected visual framing based on a template of shots. These videos and the associated meta data are centrally collected and shared amongst all community contributors. After some basic training and practice in using the application, each group is presented with multiple devices that they are expected to use to capture their videos. To meet the situational constraints of monitoring, the following was adjusted in the Our Story application: (i) Adjusted and added additional shot overlays that better represented IFRC's context (e.g. removing technology, changing building types). (ii) Adjusted shot overlay descriptions to represent narrative, rather than frame based hints (e.g. changed "A head shot, keep their head in frame" to "Introduce yourself"). (iii) Reduced the quality and bit-rate of streaming preview videos to maximise constrained resources in the field. (iv) Created a custom shoot template which could be used for all monitoring contexts, avoiding the team having to create or adjust an existing one in the field.

Audio capture quality is a key, but under represented production value when capturing on mobile devices. In response, we include basic training in the use of wired lapel lavalier microphones, which accompany each mobile device. The use of the microphones almost entirely negated the need for audio post-processing of the video. At the end of each

engagement, facilitators collect the devices and upload all videos to the platform which captures and stores each video alongside semantic meta data about who, where and what was shot ready for the review process.
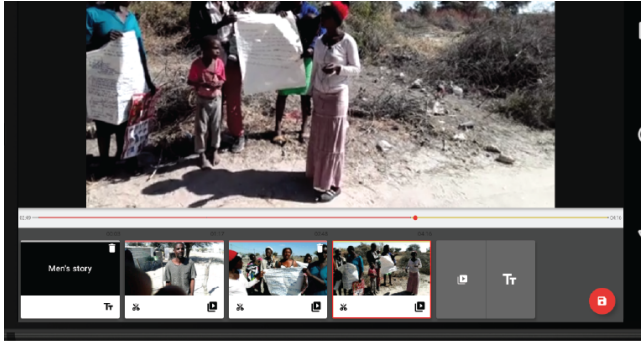

Figure 2: Editing Screen of Our Story Application

Stage 4: Review: In a typical PV process, some playback or review of video *may* occur on a daily basis by showing 'rushes' (rough edits) to the group. To drive long-term and sustained use by IFRC within the community, this process should be used to build media literacy through reflection on the source videos and how they could be improved to tell the narrative. In Our Story, at the start of each engagement with the community (usually once a day), each group spends time reviewing (watching) their own videos, as well as those from other groups. This drives self-reflection and critique on content, setting up a positive feedback loop that facilitators can use to support improvement of content, and builds media literacy through recognising positive qualities of other groups content. The Bootlegger architecture supports this process by providing a central repository of video that each community group contributes too, allowing for peer playback and review. At the discretion of the facilitators, part of this review process includes getting the group to identify they have captured different narrative elements, such as an introduction, context to the community and a clear recommendation. Groups are encouraged to re-shoot video to improve these elements.

Stage 5: Edit: In a conventional PV process, editing is facilitated by teaching a few members of the community to use commercially available professional editing tools, with support from the consultant. This most often only engages a (small) subset of the community in the editorial process, and produces only a single representative output for the whole community. Our Story supports individual groups ordering and trimming videos to produce a final edit (story). Each group can preview and select any video shot by the community, filtering and sorting videos by a number of criteria Figure 2. Our Story builds on the Bootlegger app by adding

simple titles and background music which can be added throughout the video. To reduce bias, representatives are elected from each group to form a 'community' group which produces an additional story based on collective experience using any videos from the corpus.

Stage 6: Screening: Video is screened back to the community at the end of the process, and presented to the community on a USB stick for them to keep. This builds ownership of the content, and trust in how IFRC will represent the community to the outside world, and is an opportunity to bring together the wider community who may not have participated directly in the production process. Our Story videos require no intervention or post processing after screening, reducing resource outlay outside of the field.

6 BERAU, INDONESIA

From their world-wide operations portfolio, IFRC identified Indonesian Red Cross Society's (PMI) WASH (Water, Sanitation and Hygiene) program through their own rigorous process of community selection (which they perform for all monitoring exercises), which exemplified the type of field location and community which would benefit from long term program monitoring. PMI had been working in the community for over two years, and wanted video that evidenced the impact of these works on community life and recommendations for future work. The community (633 households) was located within the Berau region of Indonesia, in a mining and farming based economy with intermittent access to power and internet. Working together with PMI, we delivered a five-day Our Story deployment (Table 1), a duration which was seen to be least demanding for both the working community and IFRC. Our Story was installed on twelve Samsung J3 Android 4G devices which we provided. Local SIM cards with data plans were purchased in the field. The team comprised of 3 researchers, 1 IFRC global representative and 2 PMI members, included to facilitate knowledge transfer of the process so that the region could continue using the method.

Table 1: The Our Story Schedule for Berau

Day	Activity
1	Narrative Building with community
2	Forming representation groups (52 people)
3, 4	Capturing and Reviewing content
5	Building final stories for each group and for the entire community, in the evening, the stories are screened to the wider community over a meal.

7 REFLECTION AND DESIGN ITERATION

Over the course of a week the community successfully produced $5x \sim 8$ minute videos. These were produced by themselves using the Our Story tool. Indeed, it was noted by the researchers that the Narrative Building and Review stage worked well in engage the community in increased creativity and engagement with the content to improve the production value of their videos, and that minimal intervention was required by the team to support the capture and review process. Unfortunately, due to regional connectivity issues, the team were unable to perform the required server synchronisation operations during the last two days of the deployment to support the editing process. This necessitated supporting the Editing stage using an off-the-shelf editing tool [2]. Content was copied to a laptop for each group, and researchers facilitated group editing through these devices, adding and trimming each shot at the participants request. While not a sustainable model for delivering this step in the work flow, in fact this gave us rich insights into how the Story Building stage should be supported in a group setting. Based on this experience, we were able to model more effectively an editing work flow that actually supported group participation, specifically around concerns of content visibility and shared decision making that the original Our Story application did not address adequately. Based on this experience, we made a number of key changes to the Our Story work flow:

Tagging Stage

Facilitating using professional editing software enforced following a well-established work flow. First, the facilitator previewed each of the group's videos, asking the group to identify those that best represented their narrative, based on their paper notes. These were placed on the editing time line in no specific order. In a second stage, the group went through each of there narrative stages and arranged clips into rough groups, in a specific order. Next, each clip in the time line was trimmed to the correct length. Finally, music and titles were added. Based on this model, we added a distinct new work flow stage: **Tagging** between Review and Editing (4.5 in Figure 1). Tags are linked to the paper based representation of a group narrative, where facilitators ask groups to identify if they have captured videos that cover all key points in the narrative (intro, background, part 1, part 2, part 3, recommendation), and label them accordingly. When entering the Editing stage, only videos that have been tagged can be placed on the time line, leveraging the group decisions already made about content. A visual representation indicates if a video has been used in the current story to aid in locating videos, and a selection of rights-free music was available to be used.

[2]Adobe Premiere Pro

Device Form Factor

Although each group received at least two mobile phones for use in the field, in practice each group opted to work together at all times. This resulted in a single smaller device being passed around the group during the review process, so that all members could see the videos. Taken alongside the advantages of using a larger laptop screen during the editing phase for increased visibility, this encouraged us to consider the use of a single large tablet device for each group. Indeed, the extra weight and size of a larger device for capturing footage seemed like a small price to pay for the benefit of shared viewing.

Offline Access

As highlighted, reliance on internet connectivity was a hindrance to supporting an effective work flow. Compounded by the nature of most of IFRC's other program locations where internet and power infrastructure are non-existent, it was key to overcome this limitation for continued deployment of the Our Story work flow. In response, we significantly adjusted the underlying Bootlegger architecture to operate totally independently of the wider internet. This involved creating shims for dependent cloud services (such as video storage and transcoding), and modifying the mobile application to support local network discovery. The result is an 'installable' desktop application that a IFRC staff member can install on their field laptop, which when connected to a WiFi router provides the same functionality as the cloud based Our Story server application. This solution provides many benefits including the ability for participants to work directly with higher quality video, and for the review, tagging and building stages to be more quickly available due to faster upload times.

8 GROOTFONTEIN, NAMIBIA

IFRC were keen to deploy within a context with more representative environmental constraints, most specifically in a remote community with no infrastructure (power, internet). Namibian Red Cross (NRCS) put forward a community in Grootfontein, Namibia (pop. ~ 3000) in which ongoing projects had been working with those affected by HIV/AIDS. In line with developing a sustainable model for IFRC, only 2 researchers were deployed, alongside 2 IFRC representatives (regional and global) and 2 NRCS members, placing focus on local NRCS staff to be responsible for delivering the process. A similar schedule to Indonesia was deployed (Table 1), with the inclusion of the Tagging stage and the deployment of the infrastructure based on a laptop at the location, without internet access. Eight Samsung Tab A 10.1" Android ($\sim$ \$200, WiFi only) devices, and a battery powered WiFi router and video projector enabled flexibility in selecting locations to work with the community. Due to the more complex nature of NRCS's intervention in the region, seven groups were

self-selected from the community to create stories, resulting in eight final videos, with which the NGO hoped to add context to existing (and outdated) quantitative reports on community needs.

9 RESULTS

In our commitment to engaging IFRC as co-researchers we dialogued with practitioners from both Indonesian and Namibian Red Cross societies prior to deployment at both the regional and national level. Post deployment, we presented our findings, output videos and overview of the process to a wider group, both from IFRC and similar organisations at a networking event, conducting further interviews (in person and Skype interviews) with eight practitioners (with combined 30 years' experience) from across the IFRC's global network. The conversations were recorded and transcribed. These were then analysed using open coding by the two lead researchers. During both deployments, extensive researcher field notes were captured, and regular review sessions were held to triangulate accounts. This was supplemented by analytics captured by the Our Story software on various aspects of user interaction and production tasks, and an analysis of the distinct and recognisable shot types [7] present in the PV output videos compared to the outputs of other initiatives.

Supporting Representation and Content Value

Our Story supports rich diverse representation of the community and high-value production of content that effectively communicates issues, by facilitating them to produce their own content. These values can be characterised through factors such as visual interest, supporting creative practice, editing flexibility, and non-intervention by professionals. In Table 2, we report on a comparison conducted between seven videos produced by traditional PV processes (in similar ID contexts) and seven videos produced with Our Story in Namibia. As a simplistic metric of visual interest we can see that videos produced by Our Story on average contain **5.57** distinct and recognisable shot types. Again this is equatable to the variety found in the professionally mediated PV videos, and supports our position that Our Story produces content which is effectively communicative. In most cases, the discrepancy between the number of clips used in the final edit, and the number of editing actions was due to the group electing members to perform the editing who regularly reviewed their decisions with the rest of the group. Driving media literacy through viewing videos from other groups is a key tenet of the Our Story work flow and we can demonstrate clearly that participants were engaging in this reflective process. Of all videos watched by each group, an average of 29.5% (s = 20.5%) were produced by other groups. Figure 3 shows that each group tagged ~40% of the videos captured, and used ~20-30% of the total in their final edit.

This suggests that a creative decision making process was taking place, in which videos were shot with different uses in mind, or that multiple shots were taken as alternatives, and then a decision was made later to include the video.

Our Story was designed in response to the inherent tension between empowering community members to participate and the complexity and media literacy required in order engage directly with production tasks in line with 'PV as process'. These production tasks can be characterised by participants performing actions relating to shooting, tagging and editing video (see Figure 3) to use in their stories. One observation we made was about the emergence of 'over shooting' early in the PV processes we facilitated, similar to professional practitioners. Over shooting is the practice of capturing more clips than needed for a particular shoot. While film professionals vary in their assessment of how much 'over shooting' should take place, what is universally agreed upon is that for a good quality final video, there needs to be enough clip choices during the editing stage. This allows for flexibility during the editing process (where the ratio can vary from 2:1 to 30:1, depending on circumstances) [48]. Indeed $\bar{x} = 53.42$ ($\sigma = 24.88$) clips were captured per group (length of $\bar{x} = 52.89s, \sigma = 19.17$ per clip) and subsequent trimming of each clip by a mean of $\bar{x} = 23.37s, \sigma = 16.08$, suggests that creative production decisions were being made by the participants. For delivery of the process by non-media trained members of IFRC Our Story needed to support participants performing editing operations without intervention. Four creative actions are performed during editing and from log data we see for each group i) added clips $\tilde{x} = 25$ (IQR=8) times, ii) removed clips $\tilde{x} = 14$ (IQR=17.25) times, moved clips $\tilde{x} = 35$ (IQR=33) times, and performed $\bar{x} = 35$ ($\sigma = 15$)

Table 2: Sample of PV videos produced for NGO Project Evaluation. *Shots: Num. unique visual shots, People: Num. of active participants in the video, as Presenters or Subjects.*

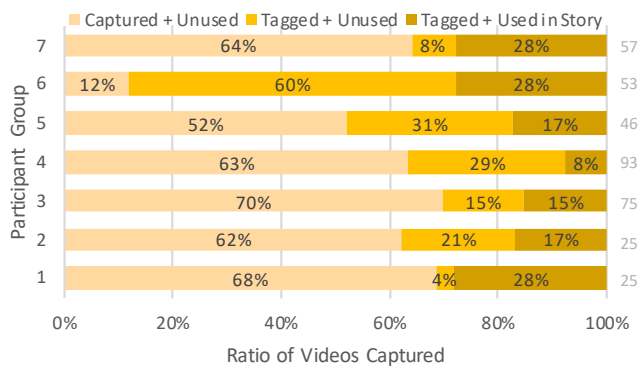| Video	Length (m:s)	Shots	People (P, S)
InsightShare [28],[26],[27]	06:50	7	32 (14,18)
	06:22	6	17 (5, 12)
	18:50	11	66 (41, 25)
Proplaneta [47]	07:33	9	10 (7,3)
IUCN [17],[16],[15]	04:16	7	14 (3,11)
	05:20	7	11 (5, 6)
	04:00	6	7 (3, 4)
Our Story 1-7	08:41	5	3 (3, 0)
	05:39	6	13 (2, 11)
	05:32	5	21 (4, 17)
	08:55	5	14 (4, 10)
	05:58	6	14 (3, 11)
	07:06	6	28 (3, 25)
	03:40	6	10 (1, 9)

Figure 3: Use of Video in Our Story by Participant Group

trims per edit. In most cases, the discrepancy between the number of clips used in the final edit, and the number of editing actions was due to the group electing members to perform the editing who regularly reviewed their decisions with the rest of the group. As can be seen from the range of participants included in each video in Table 2, what is considered representative PV (in terms of appearance as video subjects) varies considerably, but when we identify the primary motivation of IFRC to engage participants in *PV as a Process*, Our Story stands out in engaging 103 participants across the seven videos, therefore maintaining a wider representative voice of the community.

Supporting Longitudinal Use

Our Story has potential to support longitudinal use by supporting non-trained facilitators with consumer technology. One practitioner described their own view of this potential: in documenting the changes that occurred in a community over time to drive community reflection.

> "You can agree with the community at the beginning and say, every six months. We'll come back and carry out the same [process] and see how things have evolved. And every time we will show you as well how it was last time and we can trigger that discussion, but I think you need to put some structure to it" - Dave

Our Story's reliance on low-cost consumer hardware, and reduced requirement for direct facilitation to support complex production tasks means that comparatively less training is required for both facilitators and community members than existing PV processes. Indeed, involving local members of IFRC from both M&E and IT sectors in our deployments served to showcase to them the steps involved in delivering a PV process, as a first step towards peer-led training within the organisation. Similarly, the use of consumer products reduces the training required for participants, as in many cases they are already familiar with some form of mobile

technology. Nata's experience exemplifies this increase in community literacy:

> "[Mobiles] are fast and accessible to everyone... it's no longer a luxury [product]. It's a necessity. People send videos to show to others what the situation is so that's like basic assessment... And its user-friendly too when you take a video... people can master that very quickly." - Nata

In contrast, one practitioner, working in a country experiencing political conflict commented on the tension between allowing participants to express themselves and the danger of problematic statements or views being seen as endorsed by IFRC's because they were featured in a film produced by them:

> "[IFRC local chapter] was a bit scared of [PV] though because you never know what will come out, if they [community] start saying things.. bad stuff, and then your logo is all over it." - Muni

This opens up an interesting dichotomy between empowering communities to produce their own content, while being able to disseminate that content through an organisational network. Our Story supports the creation of individual videos that represent key community sub-groups, to ensure that diverse voices could be heard without the homogenisation that might result from focusing on delivering a single narrative. Thus we ensure that while the videos can be used for further engagement and promotion by the NGO, the poly-vocality of the community is not lost in the process. This is further aided by how Our Story leverages meta data produced by the production pipeline, reducing the typically significant pressures of clip management in a traditional editing process. The result is individual groups sharing their own stories without having to compete with other narratives from the rest of the community, and thus shared to the wider network.

10 DISCUSSION

Our results show that there clear potential for Our Story to be used for M&E at scale. However, our experiences raise some key lessons for the wider M&E community around the effectiveness and potential of PV work flows within the NGO sector.

Addressing Resource Challenges for PV

IUCN [31] have previously explored utilising a PV process that allows different groups within a community to have their own narrative. However, this process was resource intensive: it was conducted over three weeks and the capture and the editing process was conducted by non-community members using specialist equipment. InsightShare in contrast, is well-known for producing videos of high production value and good community representation. For example, in one instance [28], a 19 minute video was produced which

showed the views of 66 community representatives. However, the prohibitive costs of equipment used by them, and specialist skills required for operating this equipment and facilitating the editing process raises questions about its viability for resource-constrained NGOs. The increased availability of PV-ready technologies within remote communities means it might soon be possible to use existing regional resources, whilst heeding the warning of Gumucio-Dagron, that they "should be adequate for the needs of the communities, not in terms of technical standards alone, but in terms of utilisation, learning and adoption" [22]. The total cost of delivering a week long monitoring exercise using Our Story is approximately £5000 (£1000 one-off equipment investment), although given technology trends we speculate that this will reduce over time. This is in contrast to the market rate for typical PV consultancies which, according to our collaborators, charge around £40,000 per deployment (for example, a PV initiative organised by the International Institute for Environment and Development (IIED) cost £45,000, including a £7000 one-off equipment investment [36]). The specialist skills that are required to facilitate video production have previously restricted the role that low media-literate NGO staff can play. In the Our Story process, such staff directly facilitate the community. Thus, engaging communities in the process of creating videos can be just as insightful for the NGO as the resulting videos [34]. Similarly, by engaging locals, they gain a better contextual understanding of the community and their situation, rather than receiving information filtered through a 3rd party's report generation process (and inherent editorial bias), allowing them to better understand and serve those communities. However, we feel that the growing ubiquity of these skills and the notion of 'specialist knowledge' is increasingly overstated: although most of the participants we worked with hadn't made film before, they demonstrated high existing levels of media literacy, reducing the burden of operating (what was not too unfamiliar) equipment.

Representation & Interpretation of Community Voice

Our Story aims to reduce the bias introduced by external entities through enabling community members to directly manipulate content. However, it does not consider or support the wide range of cultural and experiential diversity present across different Development contexts, and as such, care should be taken to critically examine how the nuances for each region and its socio-political and cultural tensions are respected within the PV pipeline. By reducing the number of potential facilitator interventions and increasing the familiarity of the practitioner with the process, less opportunities are presented for the introduction of external bias [45]. However, translation of content is key to delivering value

for the NGO, but translators are often from the local communities and therefore directly in conflict with producing unbiased content. Thus, issues emerge around the authentic representation and interpretation of community voice. The current format of producing community videos at the end of the PV process faces questions about how it can adequately represent the voice of other stakeholders without diminishing the impact of the community voice. A separate video that brings together the voices of non-community members such as local government officials, NGO practitioners etc. might be one solution, but equally, it might detract from the PV process. These are important concerns for the M&E practitioners within Development contexts to consider as they design PV initiatives. Issues within a community don't occur in a vacuum - other stakeholders such as national level staff and local government have a say in how issues are addressed and how projects are shaped. M&E practitioners thus face the challenge of including the voice of multiple stakeholders and how each stakeholder's voice interacts and responds to the community's voice. Monitoring is an "ongoing process of data capture and analysis for the purpose of control" [14] and can be better supported through approaches such as Our Story. Our experience demonstrates that by using careful work flow design and through (now financially viable) consumer technologies, barriers to supporting sustainable PV can be broken down. A flexible end-to-end PV production pipeline design can be re-used in contexts which share complex situational constraints, but there remain significant challenges in maintaining authentic representation and interpretation of community voice in the context of a complex stakeholder landscape.

11 CONCLUSION

In this paper, we presented Our Story, a technology-supported work flow for facilitating Participatory Video (PV) in International Development contexts. Current PV solutions are often resource intensive (e.g. high costs for equipment and workshop consultants) and due to their reliance on specialist video production equipment, are barriers to entry for NGOs wanting to engage communities. Working closely with IFRC, we piloted and deployed Our Story to engage community members in project Monitoring. By leveraging consumer technology and reducing the skills barrier for facilitating video production, we show how Our Story meets the challenges of PV in these contexts, enabling resource constrained NGOs and marginalised communities to utilise PV more frequently in M&E processes. Although our findings are applicable and equally valid when considering traditional forms of evaluation such as surveys or structured interviews, we have drawn attention to specific design challenges around the potential for further bias and accessible content creation which need to be addressed by the community.

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