Using video data in project management research

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Abstract

In project management research, on site engagement is acknowledged as being good practice for gaining primary data and understanding the context of the projects being studied. However, it is not possible for researchers to be on site for every project they intend to research because projects can be difficult to access, or may be secret during the execution phase, or simply may have been completed a long time ago. Reading the project documents will provide a substantial amount of information, but there will be more to any project than written data alone, as project practitioners are well aware. Advances in technology since the beginning of the 20th century enable the filming of project works and perhaps the main benefit of that filming is to document the process for documentary production. Since the camera can capture a wealth of detail and rich complexity that it is impossible or very difficult to capture by other means, and since the eye and ear can acquire a great deal of information that it is practically impossible to write down simultaneously, can the use of such video data be beneficial in project management research? This paper reports the experience of the authors in using video data in such research. More than 250 hours of video data have been examined in researching British aviation projects during the period of the Second World War. The benefits of, and guidance for, using video data are presented, as well as cautions about what may affect the successful use of video data.

Keywords
Video data, project management research, World War 2, data acquisition

1. Introduction

A cornerstone of research is the data. The availability and quality of data play a crucial role in the success or failure of any research project. To acquire serviceable data, researchers deploy many methods and means, some of which include conducting interviews, accessing written documents, and simulation. These strategies for acquiring data differ widely from one

profession to another, and even within the same profession. Several factors affect the choice of a data acquisition method; for example, acquiring mathematical data, documents and reports can be good sources of information, while interviews can be excellent sources of soft data, such as emotions and attitudes.

One of data source that has been used in research is video data (VD). VD is a well-recognised source of data in many areas of study such as psychology and anthropology. However, despite having conducted project management (PM) research for some time, we have not seen the application of such data in project management research. This raises the following question: Can the use of video data be beneficial in project management research?

We collected a variety of video clips related to aviation projects in the United Kingdom (UK) during World War 2 (WW2). The total length of these clips exceeds 250 hours. We examined this collection for possible beneficial use in PM research. This effort is part of ongoing research investigating project success during national crises, such as times of war. In this article, we report the experience we gained in the use of video data in PM research in the form of a classification scheme, practice guidance, and the advantages and challenges that may affect the good use of VD in PM research.

2. Sources of data in PM research

In the research world in general, there are abundant data sources. The use of a specific source depends on the suitability of that source to the discipline and the method of the research. For example, historic documents are a suitable data source for researching historic events, while lab experiments are data sources that are suitable for researching science topics.

In PM discipline, several sources of data are commonly used. Predominant among them are surveys and questionnaires. **Error! Reference source not found.** shows the main sources of data in PM research and gives examples of articles that have used such sources.

Table 1: Sources of data in PM research

Data source	Examples of literature that have used this source
Interviews	Wells, 2012
Surveys and questionnaires	Turner and Zolin, 2012; Ning, 2013; Yee Cheong and Nur Emma, 2012; Yang, 2012; Ika et al., 2011
Project documents	Lenfle, 2011
Research databases	Davis, 2013
Simulation and mathematical modelling	Ford and Bhargav, 2006; Mawby and Stupples, 2002
Field observation	Sullivan and Lines, 2012
Literature analysis	Müller and Jugdev, 2012; Jugdev and Müller, 2005

| Mixture of above data sources | Engwall, 2003; Crawford and Helm, 2009 |

In all the PM literature we reviewed, we could find no evidence of VD being used as a source of data in PM research, and we may therefore pioneer this approach.

3. Video data

The word "video" is defined as "a recording of moving visual images made digitally or on videotape" (Oxford Dictionaries, 2013). It is derived from the Latin word (vide) which means to see. We mean by video here all types of moving visual images of any kind such as films and digital media. We define VD as "the information and messages that can be extracted from a certain video clip". These messages and information can be direct, such as news reportage, or indirect, such as the emotions revealed by the gestures of people in the video clip. Video data is found in a very wide array of collections and dealing with it as one segment is inefficient. To facilitate the process of analysing VD, therefore, we need to classify it into specific categories to make the practical use of the process more efficient.

3.1. Classification of video data

"To classify" means " to arrange (a group of people or things) in classes or categories according to shared qualities or characteristics" (Oxford Dictionaries, 2013). This implies that there are many classes to choose from.

Researchers and practitioners in any field use different schemes for classification purposes; for example, medical practitioners may classify patients according to their age or ethnicity. There can be a combination of classification dimensions in one scheme.

In the PM discipline, many dimensions are used for classifying projects such as industry type (e.g. construction and defence), or product novelty (e.g. radical and incremental).

VD is no exception from the wide possibilities of classification dimensions. The language, the length of the clip and the time period of the clip are among the possible dimensions by which VD can be classified, but we propose a generic classification scheme that will help to prepare the VD for research purposes. Our classification scheme, shown in

, consists of three dimensions with two categories in each dimension. These dimensions were chosen because the researchers need the information to be unbiased, true and original. The reporting type deals with the information bias, the purpose of the recoding deals with the information truth and the originality dimension deals with the information originality.

Table 2: Video data generic classification scheme

The dimension	Description
Reporting type Analytical vs. informative	Concerning the type of information presented in the video clip. The analytical type presents an analysis of the content of the video clip while the informative type presents straightforward information about the content.
The purpose Propaganda vs. documentation	Concerning the purpose behind recording the video clip. The propaganda type is a clip that has been purposefully recorded for advertisement and propaganda, while the documentation type captures the event at face value without manipulation.
Originality Original vs. reproduction	Concerning how original is the recording? An original is a clip that captures an actual event at the time of its occurrence, while a reproduction is a clip that contains a representation of the event through acting or reconstruction from various sources to resemble the original event.

Each video clip can hold a description of three categories and this scheme contains eight classification possibilities, as shown in Figure 1. These eight categories resulted from the binary combination of 2^3.
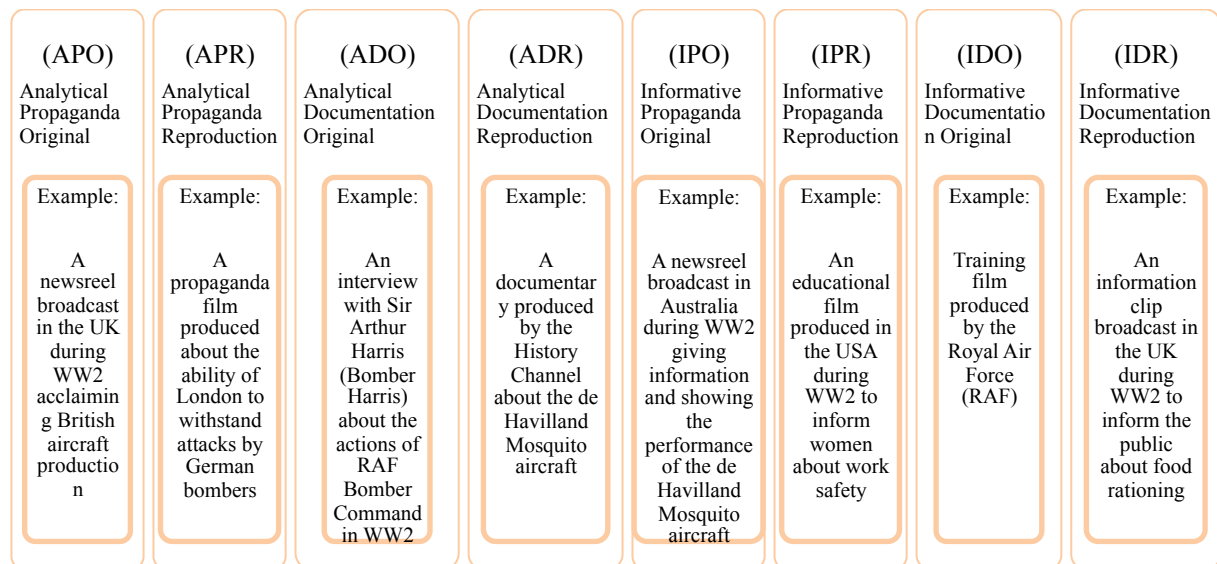
(APO)	(APR)	(ADO)	(ADR)	(IPO)	(IPR)	(IDO)	(IDR)
Analytical Propaganda Original	Analytical Propaganda Reproduction	Analytical Documentation Original	Analytical Documentation Reproduction	Informative Propaganda Original	Informative Propaganda Reproduction	Informative Documentation Original	Informative Documentation Reproduction
Example: A newsreel broadcast in the UK during WW2 acclaiming British aircraft production	Example: A propaganda film produced about the ability of London to withstand attacks by German bombers	Example: An interview with Sir Arthur Harris (Bomber Harris) about the actions of RAF Bomber Command in WW2	Example: A documentary produced by the History Channel about the de Havilland Mosquito aircraft	Example: A newsreel broadcast in Australia during WW2 giving information and showing the performance of the de Havilland Mosquito aircraft	Example: An educational film produced in the USA during WW2 to inform women about work safety	Example: Training film produced by the Royal Air Force (RAF)	Example: An information clip broadcast in the UK during WW2 to inform the public about food rationing

Figure 1: The eight classification possibilities

These categories have different characteristics from one another, and the objective of the research determines the suitable category (or categories) applicable to that research. To align

the details of these categories with relevant project management research, we will discuss this point in the practice guideline in section 4.2.

3.2. Features of video data

A video recording or clip usually contains sound and a series of pictures, although sometimes the clip can be silent. Both types of clips share the following features:

- The richness of detail: video recording can capture all the details that are exposed to the lens and the microphone. The conscious mind of a human being cannot acquire all these details at once. Some events, such as work accidents, happen very quickly, and their shocking nature distracts the observation process. Moreover, this type of event occurs once and cannot be re-enacted. A video recording retains such events in very great detail.

- The ability to repeat the scene: in the real world, there is no way to see an event again except by means of a recording. For example if a researcher is observing a certain phenomenon and misses some parts for any reason, such as sleeping or due to the effect of the selective perception phenomenon, the only possible way to see the missed part is in a video recording. Because of the richness of detail contained in the VD and the inability of the human brain to acquire all these details at once, the facility to repeat-view enables the performance of many rounds of data extraction without losing the top level of data originality.

- Retaining a high level of data originality to allow re-examination without distortion: recording data in such forms as written documents usually carries the risk of distortion in one way or another. For example, if a researcher is taking notes from the field, these notes will be written in that researcher's style, while another researcher may interpret that style of writing in different way because everyone has their own distinctive way of writing and understanding. By contrast, there is no intervention by the researcher in the field when an original event is recorded as it is, so any researcher will see exactly the same clip. On this basis, the consensus of researchers who uses the same original video data can be much stronger than if other forms of data, such written field notes, are used.

- Ease of use, storage and retrieval: video data is very easy to use nowadays thanks to the availability of video playback systems almost everywhere. The process of recording is much easier than ever before, given that the video recording function is available even in cheap mobile phones. With digital technology being the main

technology for processing, VD can be stored in very small electronic mediums such as USB flash memory or hard disks. A full day's broadcast by a television channel can be stored in a cheap USB flash memory that can retain this data for many years and make it available instantly. Moreover, being stored electronically, VD can easily be transferred through electronic communication mediums such as the internet.

These are the most notable features of VD that we believe are relevant and appealing to the PM research world.

4. Using VD in PM research

4.1. The significances of video data in PM research

Video data demonstrates its significance in our research in a very obvious way: it helps the researcher to gain a deeper understanding of the context of the project that could not otherwise be gained than by being there. Between 2010 and 2013, we studied projects executed during WW2 during the 1940s. Many of the original documents about these projects were available, but there was no way to extract soft data such as the emotions and morale of the project teams from the written data. Such soft data may yield crucial insights into what makes a project successful during crises. Video data provided us with soft data as if we were living the event. Also, many tiny details, such as workplace arrangements, cannot be fully understood from the written data, but with VD we could build a better mental image of the projects we studied, which helped us to achieve better results. Another significant point is that PM research is now being conducted on an international scale where researchers from one country study projects from another country. There is now an even greater need to build common understanding between research teams about the project environment, and access to VD provides a very suitable mean to enable this. Our research team contains members from Australia, Saudi Arabia and Germany. We were studying cases in the UK that took place before the most senior of our team members was born, yet by using VD, we could build a detailed understanding about these cases and obtain significant findings.

Our experiment of using VD in PM research showed, for example, that it would have been impossible for a researcher from Saudi Arabia doing research in Australia to gain a deep understanding of the British project context in the 1940s without using VD. It helped to convey all the contextual knowledge, as well as many project details, without the need to be a WW2 veteran.

4.2. Practice guidelines

Based on our experience with VD in PM research, we suggest the following guidelines for the effective use of VD in PM research.

- Develop a referencing scheme for your clips

It is practical and efficient to have your data easily accessible, and one way to achieve this is to develop a referencing scheme that contains all the necessary information about the clip, such as an informative title and a summary about the clip's content. Worth noting is that instead of a page number, as used in paper documents, a video document is better referenced by a time marker. For example, you can refer to a point in the clip as "minute 4:30", or to a period of minutes such "3:30 to 6:20".

- Classify the clips according to the suggested classification scheme

Classifying the clips helps to guide the researcher to the best way of dealing with the data, what to expect from it and what to be aware of. The researcher needs to make an initial assessment of the clip to determine which of the eight types in this scheme best suits the clip. Each type of VD in the provided classification scheme will be discussed below.

Analytical Propaganda Original (APO): This type provides the opinion or analysis of someone other than the researcher in a propagandistic way. This diminishes the level of originality of the research because the researcher may be directed toward a certain conclusion. The original visual scenes many provide useful details, but the propagandistic nature of this type threatens the objectivity of the research. There is little to gain from this type of VD to aid original PM research.

Analytical Propaganda Reproduction (APR): This type has the same drawbacks as the APO type, plus it lacks original scenes. This type should not be used in original PM research.

Analytical Documentation Original (ADO: This type provides the analysis done by someone other than the researcher but the originality of the visual scenes and the documentation nature of this type can provide a good deal of information. The researcher should be aware of the possible bias of the narrator.

Analytical Documentation Reproduction (ADR): This type provides the analysis by someone other than the researcher plus the drawback of reproduction. This type has very little to offer original PM research.

Informative Propaganda Original (IPO): This type provides true information in a propagandistic way with original scenes. If the researcher can eliminate the exaggeration of the propaganda, good details can be extracted for original PM research.

Informative Propaganda Reproduction (IPR): This type is less useful than IPO because of the reproduction. There is little for original PM research in this type. Only the narrated information can be used.

Informative Documentation Original (IDO): This type provides true information that documents the event with original scenes. This type is the best for original PM research. The threat to objectivity is minimal because no analysis is provided to the researcher, and the details of the original event are presented.

Informative Documentation Reproduction (IDR): This type carries the advantages of the IDO type but has one drawback, which is the reproduction. Nevertheless, a good deal of information can be extracted from the narration.

It is worth noting that in this classification, there might be some overlap between types, but the researcher should categorise according to the overwhelming characteristics of the clip.

- Extract the data to suit your analysis method

After classifying your clips, extract the data and prepare it to suit the analysis method you use for your research. VD can be used equally well with many analysis approaches; for example, for a qualitative analysis approach, build the themes and codes or answer the research questions as you go through your clips, and cross reference each segment from the VD to a suitable theme or question. For a quantitative approach, extract the required numbers from the clips then apply the numerical analysis you need for you research.

These three points offer the basic guidelines from our own experience for using VD in PM research.

4.3. Advantages and drawbacks

The VD features mentioned above reflect its use in PM research. The richness of detail gives the PM researcher greater ability to extract information than any other mean. This feature demonstrated its importance when we investigated projects from the WW2 era. It is almost impossible to find an interviewee who can answer questions about workplace arrangements and project team moral during that time; however the rich details accompanying the video clips of those projects helped us to extract many details and soft data.

The ability to replay the scene and the ease of use, storage and retrieval gives the PM researcher the chance to conduct multiple rounds of analysis, with each round focusing on a single aspect. For example, in researching aviation projects from the 1940s, we made one round of analysis to focus on how the materials were managed in those projects. In another

round we focused on the security issues of those projects. Without this feature, it would be more difficult to conduct multiple rounds of analysis.

Another advantage of using VD in PM research is that it reduces the impact of distance or time. For example, we are researchers in 21st century Australia, researching projects in 1940s UK thanks to the available VD from that era.

Visual data also deals with multiple human senses, which increases the capacity to acquire the knowledge. On the other hand the most important challenge to be faced in using VD in PM research is that video clips are not usually produced to address particular research questions, so to acquire quality details to answer one question, a researcher needs to view many hours of clips, which is very time-consuming. In addition, the interpretation of the VD can be subjective if the data is not numerical, or if it is ambiguous, so the researcher must be aware of this possibility and use suitable techniques, such as triangulation, to reduce this problem.

5. Conclusion

This article aims to report the experience we gained in using VD in PM research. Video clips are rich and beneficial sources of data but are not widely used in PM research. Using more than 250 hours of VD, we examined the use of such source of data in PM research. We found this source extremely useful. We presented the features of VD that made it useful and we developed a classification scheme to categorise video clips. Also we devised guidelines for using these clips in PM research. This attempt is an innovative effort. Nevertheless more research is needed to enhance the understanding and practices of using VD in PM research.

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