
How People Describe Their Music Information Needs: A Grounded Theory Analysis Of Music Queries

David Bainbridge

Department of Computer Science
University of Waikato
Hamilton, New Zealand
davidb@cs.waikato.ac.nz

Sally Jo Cunningham

Department of Computer Science
University of Waikato
Hamilton, New Zealand
sallyjo@cs.waikato.ac.nz

J. Stephen Downie

Graduate School of Library and
Information Science
University of Illinois at Urbana-Champaign
Champaign, Illinois, USA
jdownie@uiuc.edu

Abstract

How do users of music information retrieval (MIR) systems express their needs? Using a Wizard of Oz approach to system evaluation, combined with a grounded theory analysis of 502 real-world music queries posted to Google Answers, this paper addresses this pivotal question.

1 Introduction

In this paper we study the issue of what facilities people really want when performing a music information retrieval (MIR) task by analysing the questions and answers posted to the music category of Google's "ask an expert" service, Google Answers. This work builds on a previous study that analysed postings to a Usenet newsgroup for a specific genre of music: 'old time' country (Downie and Cunningham, 2002). The set of music queries analysed in this present work is considerably larger (approximately four fold), and the scope of questions more broadly based.

Google Answers is essentially a reference service affiliated with, but not restricted to, the Web; the music category can be broadly seen as an MIR system in which the 'interface' involves submission of natural language queries to be 'processed' by human experts. The queries posed to Google Answers express authentic music information needs, not constrained by necessity to use an artificial query language. We argue this adds up to a "Wizard of Oz" system for music information retrieval—that is, the Google Answers experts simulate the processing of an MIR system. The Wizard of Oz technique is commonly used in computer application design to evaluate an approach before it is implemented, in an attempt to gain insights that can help evolve the design before irrecoverable coding decisions are made (see, for example, an overview in Dahlback et al, 1993). We use the approach here to see what sort of capabilities an MIR needs to serve a diverse group of users.

2 Data collection

Google Answers makes an interesting case study since it has a sizable number of users and experts, has been running a reasonable length of time (over 1 year) and music questions in particular seem a popular preoccupation: music is large sub-category within Arts and Entertainment. 626 postings were retrieved from the music sub-category, spanning 10 April 2002–1 April 2003. Note that it is the poster who determines the subject category associated with the question, so it is the users themselves who have decided that these are fitting music queries. However, 5 postings in our analysis were discarded as being off-topic (for example, "How do you find investors?"). An additional 119 postings were related to the music industry rather than to music itself, and so these postings are not further analyzed in this paper.

The 502 remaining postings in the music category were analysed using a grounded theory approach (Glaser and Strauss, 1967). With this technique researchers attempt to approach the data without prior assumptions, and to generate theory from the data. The queries were coded to characterize the types of details users are able to offer when describing their information need.

3 How do people describe what they want?

Unfortunately, space limitations preclude a detailed explication of the analytic categories emerging from the queries. Table 1 shows that for the majority of music queries analysed (slightly over 80%), users are able to provide some form of *Bibliographic* metadata when describing their information request. By far the most common bibliographic attributes (Table 2) supplied are the name of the *Performer(s)* and the *Title* of a work—certainly an MIR system should include these metadata, as a bare minimum. A small proportion of queries included a URL *Link* to a webpage providing additional bibliographic metadata. *Orchestration* might include instrument, vocal range of singers, or (most commonly) the gender of the singers. The default *Language* for lyrics appears to be English, and language was only mentioned in the query if the desired work(s) had non-English lyrics. Similarly, the *Nationality* of the performer (Table 2) was primarily mentioned when that person was not from the

Permission to make digital or hard copies of all or part of this work for personal or classroom use is granted without fee provided that copies are not made or distributed for profit or commercial advantage and that copies bear this notice and the full citation on the first page. © 2003 The Johns Hopkins University.

Category	Description of information need includes...	Count	%
BIBLIOGRAPHIC	metadata (see Table 2 for breakdown)	408	81.3
GENRE	Description of the genre or style	164	32.7
LYRIC FRAGMENT	some or (rarely) all of “the words”	145	28.9
WHERE HEARD	circumstances surrounding a remembered performance or broadcast of a song	121	24.1
NATIONALITY	Nationality of performer or origin of song	63	12.5
SIMILAR	reference(s) to known work(s) or performer(s) used to defined attributes upon which describe the unknown item(s);	23	4.6
EXAMPLE	representation(s) of the desired work(s) (e.g., links to MP3 or midi files)	22	4.4
LYRIC STORY	storyline of song	13	2.6
AFFECT	‘mood’ or emotional state induced (e.g., “funny”, “silly”, “plaintive”)	12	2.4
TEMPO	speed and/or rhythm of work(s)	12	2.4

Note #1: % calculated against the set of 502 queries seeking music work(s) or music work information

Table 1. Categories of need description types

Category	Description	Count	%
Performer	performer or group who created a particular recording	240	58.8
Title	Name (or approximation) of work(s)	176	43.1
Date	date that a recording was produced, or that a song was composed	160	39.2
Orchestration	Name of instrument(s) and/or vocal range(s) and/or genders (male/female)	68	16.7
Collection title	Name of album, LP, CD, audiotape, etc	61	15.0
Composer	Name of composer	36	8.8
Label	Name of organization which produced recording(s)	27	6.6
Link	URL providing a link to further bibliographic data	12	2.9
Language	specifies a particular language (other than English) for lyrics	10	2.5
Other	bibliographic data falling outside the above categories	36	8.8

Note #1: % calculated against the set of 408Bibliographic queries

Table 2. Breakdown of BIBLIOGRAPHIC category from Table 1.

US or the UK. From these categories, it appears that quality bibliographic metadata may be crucial for use in searching.

Users experienced difficulty in coming up with crisp descriptions for several of the categories, indicating a need to support ‘fuzzy’ or imprecise metadata values for searches. For example, the *Date* of composition or recording for the desired musical items is rarely specified precisely by year. More typically, the decade will be given, or other somewhat nebulous date indications such as “recent” or “old”. The user may be uncertain as to the accuracy of the lyrics that they recall (“the chorus went something like...”). Some *Lyric* elements may not be dictionary words (“bling bling”), which poses problems for the user in trying to come up with the ‘correct’ spelling; it is also not clear how to transcribe repetitions (“Money money money mooooooneeeeeeyy.... MO-NEY!”). Sometimes users were uncertain as to the accuracy of their descriptions: “female singer, African-American likely (but i could be wrong..heck it might just be a male with a female-sounding voice)”.

Genre descriptions ranged from standard (but not crisply defined) characterizations (“jazz”, “pop”) to the highly idiosyncratic (“Sort of that teenie bop bitter angst genre”). The lack of consensus over genre categories and descriptions suggests that it may be appropriate to support (or replace) a

genre label with examples of music falling within the genre; perhaps a more productive way of locating new pieces within a genre is to allow the user to ask for ‘more things like this’ by providing music query-by-example facilities

Few queries included an audio *Example*, yet it would be premature to conclude that query-by-humming MIR systems have no potential user-base. Some queries suggest that users would like to include a musical representation but are stymied by the form-based interface to Google Answers: “The only other information that I have is what the song sounds like, but it is hard to express that via the web.”

References

Dahlback, N., Jonsson, A., & Ahrenberg, L. (1993). Wizard of OZ studies—why and how. In *Proceedings Intelligent User Interfaces '93* (pp. 193–200).

Downie, J.S., & Cunningham, S.J. (2002). Toward a theory of music information retrieval queries: System design implications. In Michael Fingerhut (Editor) *Proceedings of the Third International Conference on Music Information Retrieval (ISMIR)* (pp. 299–300). Paris: IRCAM.

Glaser, B., and Strauss, A. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine de Gruyter.