

TiNYARM: This is Not Yet Another Reference Manager

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Abstract. In order to remain aware of both the fundamental contributions and latest trends in research, reading scientific papers is a core research process. However, due to the dramatic growth of scientific publications, evaluating what is more or less relevant to read (and why) is becoming a more challenging task. To tackle this issue we present TiNYARM, a “Science2.0” tool that enables researchers to share and suggest reading activities with their peers, so that these can act as an information filter. Activity streams, Personal Information Management and Gamification concepts are applied in order to generate awareness and motivate users.

Keywords: (Self-)awareness; motivation; gamification; personal information management; sensemaking.

1 Introduction

Researchers have various information needs, from staying aware of latest trends in their own domain, to finding additional references, ideas or studies in other domains. Therefore, reading scientific papers is a core research process [1]. However, the explosion of scientific literature makes evaluating what is more or less relevant to read first (and why) a more challenging task.

Since the rise of social media like Facebook, Twitter, etc., people leverage these networks to get and/or filter content through their trusted peers [2]. In a research context, besides regular search engines, there are several scientific digital libraries (e.g., ACM Digital Library, IEEE Xplore, Pubmed, Scopus, and others) and specialized academic search engines (e.g., Google Scholar, Microsoft Academic Search, Citeseer, and others) that try to facilitate and improve the access to scientific publications. Specifically to the discovery of relevant publications, researchers have explored how relations between authors, research groups or communities-of-practice can contextualize a document and help researchers to choose which papers to read [3].

Following Science 2.0 concepts, we have designed, developed and evaluated TiNYARM¹ (“This is Not Another Reference Manager”). With this tool, we try to determine how social network approaches can be leveraged to enable researchers to be aware of the reading activities from their peers; and to which extent filtering of relevant content, through research peers, can be applied in scientific research in order to

¹ <http://atinyarm.appspot.com/>

reduce the cognitive burden of searching for and filtering relevant resources. In addition, we also try to evaluate if the application of game design mechanics (gamification [4]) and Personal Information Management (PIM) approaches [5] can increase user engagement with the tool.

2 The application: TiNYARM

In a community-of-practice, people learn from observing and interacting with other, potentially more experienced members. Our tool aims to capture and present reading activities of researchers to others, in order to allow them to filter out relevant papers for them to read. In this way, early stage researchers can benefit from the footprints of more experienced researchers to decide what to read and why. In order to make researchers aware of what others are reading, we make use of activity streams (also known as Lifestreams [6]) to visualize the information flow.

The success of TiNYARM is directly dependent on the number of contributions from members. A challenging problem experienced by many CSCW applications is the disparity between who does the work and who benefits from it [7]. For this reason, and in order to provide an attractive hook for users, we have included support for personal information management and gamification elements into our tool design, as this approach motivates sharing by providing immediate value to the user.

2.1 System design

TiNYARM is designed as a web application and developed using the Google App Engine² (GAE) and the Twitter Bootstrap front-end toolkit³. The application uses the GAE user management service together with the Google+ API in order to manage and obtain data from the users. The application consists of 3 main sections: activity stream, leaderboards and the researcher profile:

Activity stream

TiNYARM's main screen (see Figure 1) shows which papers have been read, skimmed, planned to read, and recommended to others by all researchers that use the tool. The activities are structured as follows:

Actor | verb | (Object) {Indirect object}

For example, John Doe | suggested | "Meet me in the Library" {to Jane Doe}. Other examples are available in Figure 1. The application follows an open Social Networking Site (SNS) community style, as researchers do not need to 'follow' or 'friend' another researcher in order to see their reading activities. In order to provide users the flexibility to filter or cluster activities based on personal criteria, the possibility of user grouping was added to the system. For instance, a researcher can create

² <https://developers.google.com/appengine/>

³ <http://twitter.github.com/bootstrap/>

a group for colleagues, students, interesting researchers in a specific domain, etc. These groups are particular to a user and visible only to them.

When users want to add a paper to TiNYARM, they can either manually provide its metadata (through a web form), or they can import the metadata from a search to an academic library (through a web search form), like the reference manager Mendeley. Additionally, a researcher can use a web browser bookmarklet to directly add papers to the system.

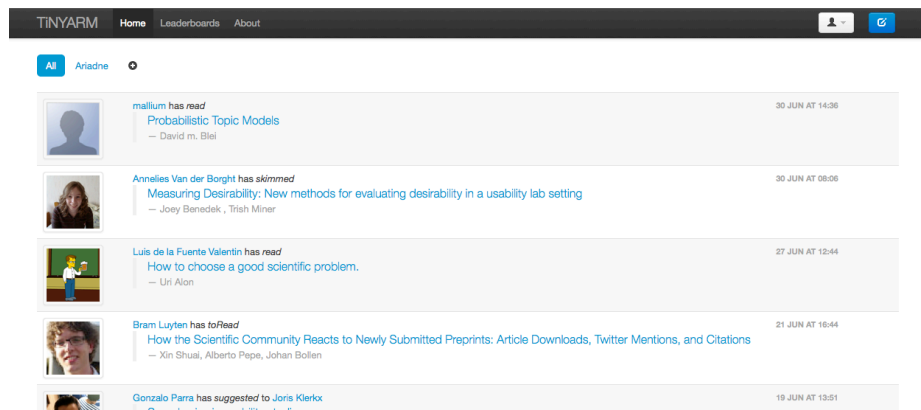


Fig. 1. TiNYARM’s main screen (activity stream). The activities are structured as: Actor | verb | (Object) {Indirect object}.

Leaderboards



Fig. 2. TiNYARM’s general leaderboard.

Through the use of leaderboards, TiNYARM tries to encourage competition between researchers in a light and ‘fun’ way. User rank is determined by activities as reflected in the number of “read”, “to read”, “skimmed” or “suggested to others” papers. The application has a global leaderboard based on a score that is calculated from the activities of the last month – see Figure 2. To obtain this score, the different actions are weighted. While designing the application, this rating system was evaluated via feedback from test users.

In addition, specific leaderboards for all individual actions are available in order to recognize, for example, who is the most active reader or who is the most collaborative researcher.

User Profile

This section of the application provides PIM support for the researcher. PIM is applied to organize, maintain and share the reading activities. Researchers are able to keep track of what they have read or skimmed and they can maintain a list of ‘toRead’ publications. In the same way, a list of papers suggested to them by other users is available. These lists are also presented following an activity stream pattern and are only visible to their owner.

3 Relation to the Workshop

An initial user study (which is currently part of a publication under a review process) shows that the tool seems to be usable but not completely convincing, as there is some uptake but with a rather not clear perception of usefulness by users. Specifically to this workshop, we would like to:

- Present how the tool is being used by different the communities of practice (undergrads, PhD students, postdoctoral researchers and professors), and which motivational and affective aspects should be included in order to support them.
- Discuss other gamification approaches that could motivate users as a group or individuals.
- Present and discuss about the introduction of reflection mechanisms.
- Discuss and get suggestions regarding other techniques that could increase motivation of the user.
- Discuss and get suggestions regarding typical workflows of researchers.

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