

# Future Email Services and Applications

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**Abstract.** In this paper we present work in progress - Acoma system. Acoma processes email communication on a server or a desktop and attach relevant information from various sources to email messages. It can be used within any email client or mobile device since it acts as a proxy to SMTP or POP3.

**Keywords:** email, context sensitive information, information management

## 1 Introduction

According to recent surveys, information workers send and receive an average of 133 messages per day<sup>1</sup>, and users talk about 'living' in email, spending an average of 21% of their time in the application. In 2001, information workers received just about 20 email messages a day and sent about 6 messages<sup>2</sup>. While number of received messages is increasing, sending stays pretty much on the same level [1].

Email is rarely a standalone information source, but often contains pointers to further information such as files (e.g., saved attachments), links to items on the web, and references to other resources. Email is currently used as a conduit for many functions [2] [3], including alerting, archiving, task management, collaboration and interoperability. Similarly as Gmail offers context sensitive advertisements, Acoma offers context sensitive info suitable for business tasks represented by email.

In this paper we discuss vision and possibilities for personal, community or enterprise information management solution built on top of email communication. The paper discusses the updated Acoma<sup>3</sup> system [4].

## 2 Approach and Architecture

The Acoma ambition is to support users in business tasks within email communication. Acoma is hooked into the mail server (Figure 1 left) or desktop (Figure 1 right), similarly as email antivirus programs are used at the server or desktop side. This way the system can be used within any email client, without requiring changes to working practices or the adoption of new tools.

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<sup>1</sup> White paper by The Radicati Group, Taming the growth of email: An ROI analysis, 2008

<sup>2</sup> GALLUP; All E-Mail Users Say Internet, E-Mail Have Made Lives Better; 2001

<sup>3</sup> [http://laclavik.net/publications/laclavik\\_isu\\_email.ppt](http://laclavik.net/publications/laclavik_isu_email.ppt), <http://www.commius.eu/>

Email communication is passed through the Acoma system, processed, and additional information is added to email messages in form of links in HTML or text attachments (see Figure 2). This additional information contains relevant information, hints or links to business resources such as document repositories, databases or information systems needed in context. Email context is detected by automatic semantic annotation while using predefined regular expressions patterns [5].

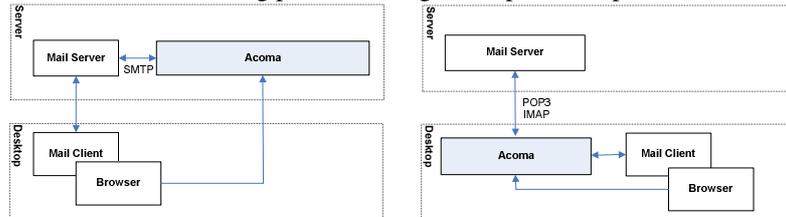


Fig. 1. Left side: Acoma connected to the email server; right side: Acoma at the desktop.

### 3 Applications and Example of Use

We believe that the Acoma approach can be used in many applications in a corporate or community environment including Knowledge Management, Social Networks, Information Management or Enterprise Interoperability (EI).

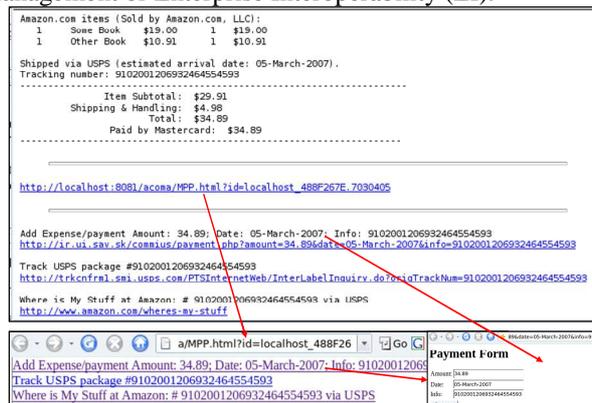


Fig. 2. Email with Acoma attachment; Bottom left: Acoma GUI; Bottom right: intranet system form with pre-filled in info, open by clicking on the link in email or Acoma GUI.

We focus mainly on EI. Today, a lot of business communication done via email is created automatically (system-to-person communication) via Web 2.0 applications and systems<sup>4</sup>. This includes communication such as registration confirmation, order confirmations, invoices, payments or notifications, which are human readable, but partially structured as well. Contextual information can be extracted quite easily using pattern based extraction and later inserted into a database, a spreadsheet, a web form in intranet systems or can provide bases for connection and automatic search of additional information needed to accomplish business tasks represented by email.

<sup>4</sup> <http://www.returnpath.net/blog/2008/07/case-study-web-20-runs-on-email.php>

Message processed by Acoma is shown on Figure 2. It is based on a bit modified email received from Amazon.com. Acoma added text attachment with links into the email. Actions such as *tracking of shipped package* or *adding the payment into the intranet system* can be taken by a user via clicking on the link in the text attachment. In addition, email can include a link which will display Acoma GUI related to a message in the browser (bottom left). This GUI contains similar information as a text attachment in the message but can be better formatted and more interactive. Depending on settings, Acoma can modify email to include text, html attachments or just a link to GUI.

When a user wants to add a new hint/note to be shown in concrete context, he/she can do so by writing a note, defining URL to be accessed and selecting context from available objects. For each of these objects regular expressions (regex) pattern need to be defined (e.g. for tracking number simple regex is defined „Tracking number: \*([0-9]+)“). Example for „Track USPS package” can be seen on Figure 3, where hint/note context is defined as *USPS shipping company, Tracking number* and *shipment company* detected by „Shipped via ([a-zA-Z]+)“ regex.

Notes		
PAYMENT2	ID	acoma:TotalAmount
SHIPMENT	SHIPMENT	acoma:Date
SHIPMENT_AMAZON	NOTE	
	Track USPS package # {shipment:TrackingNumber}	shipment:TrackingNumber
	URL	shipment:Company
	query.do?origTrackNum={shipment:TrackingNumber}	company:USPS
		company:Amazon

**Fig. 3.** Web Interface for editing of hints. Objects in brackets are replaced by values from email context. Context is defined by selecting objects on the right side.

## 4 Conclusion

We have presented how email can be interconnected with relevant information sources in working context. At this stage, Acoma is suitable mainly for processing of partially structured emails, where objects can be discovered using pattern detection. In the future, we believe, Acoma can help with any enterprise or community email communication. This work is supported by projects Commius FP7-213876, AIIA APVV-0216-07, SEMCO-WS APVV-0391-06, VEGA 2/7098/27.

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