The Use of the Recipe as a Guiding Metaphor for Flexible and Efficient Self-Guided Computing Instruction

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Abstract
The challenge of providing self-guided instructional tools for diverse sets of experiences, needs and ways of interacting with computers remains a challenge for those producing tools. This article describes the way in which the recipe-based method can provide a useful methodology for instruction in diverse humanities computing challenges.[1]

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A Recipe for Effective Self-Guided Instruction

Ingredients
Ingenuity;
A Useful Metaphor;
A Versatile Set of Tools;
Users Desirous or Willing to Consider Using Said Tools.

Steps
    1. Identify the objective
    2. Consider the target users needs
    3. Develop a series of cases studies that describe how your tools
       can meet these needs
    4. Apply a familiar metaphorical approach to engage and instruct
       potential users
    5. Deploy the recipes through a wiki to encourage evolution and
       feedback

Glossary
Recipe: a useful guiding metaphor that offers optimal flexibility for
users to learn and appreciate text analysis tools.

Discussion
At CaSTA 2006

Further Information
    1. Read the Rest of this paper.
    2. Contact the Author.
    3. Try other recipes at http://tada.mcmaster.ca/Main/TaporRecipes.
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Introduction

The Text Analysis Portal for Research (TAPoR) provides a diverse, powerful and useful set of text analysis tools allowing a professional user to quickly and efficiently accomplish text analysis tasks. Although the tools may be familiar in outcome to the user, their operation may be unfamiliar. Moreover,

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there is a huge potential base of users, both in academia and private enterprise, who could potentially benefit from text analysis, but have little awareness of or training in how text analysis tools may be of use. At CaSTA 2005 Stan Ruecker proposed that TAPoR should develop "recipes" that match research questions humanists pose and walk them through how text analysis tools can help answer those questions. Armed with this valuable suggestion a project was initiated to develop a series of recipes that could introduce a wide range of humanists and social scientists to these tools.

Subsequent experience demonstrated that the seemingly simple task of developing these recipes was much more complex that initially anticipated and raised a variety of intriguing challenges that called upon further examination and definition of how the *recipe* metaphor should be applied.

The concept of a recipe has been used with some regularity in computer instruction manuals of late. Many are probably familiar with the O'Reilly series of computer reference books. However, the concept of recipe used by these works is somewhat distant from that in the common kitchen cookbook which they claim to mimic. The kitchen cookbook offers a rigid component-based outline and simple routine to produce a finished product. These technical 'cookbooks' typically offer a distinct problem and a very specific descriptive solution, but rely less on the component-based metaphor. Our approach involved rethinking the recipe metaphor with an eye to the more familiar kitchen-based variety while attempting to benefit from discursive O'Reilly-like approach.
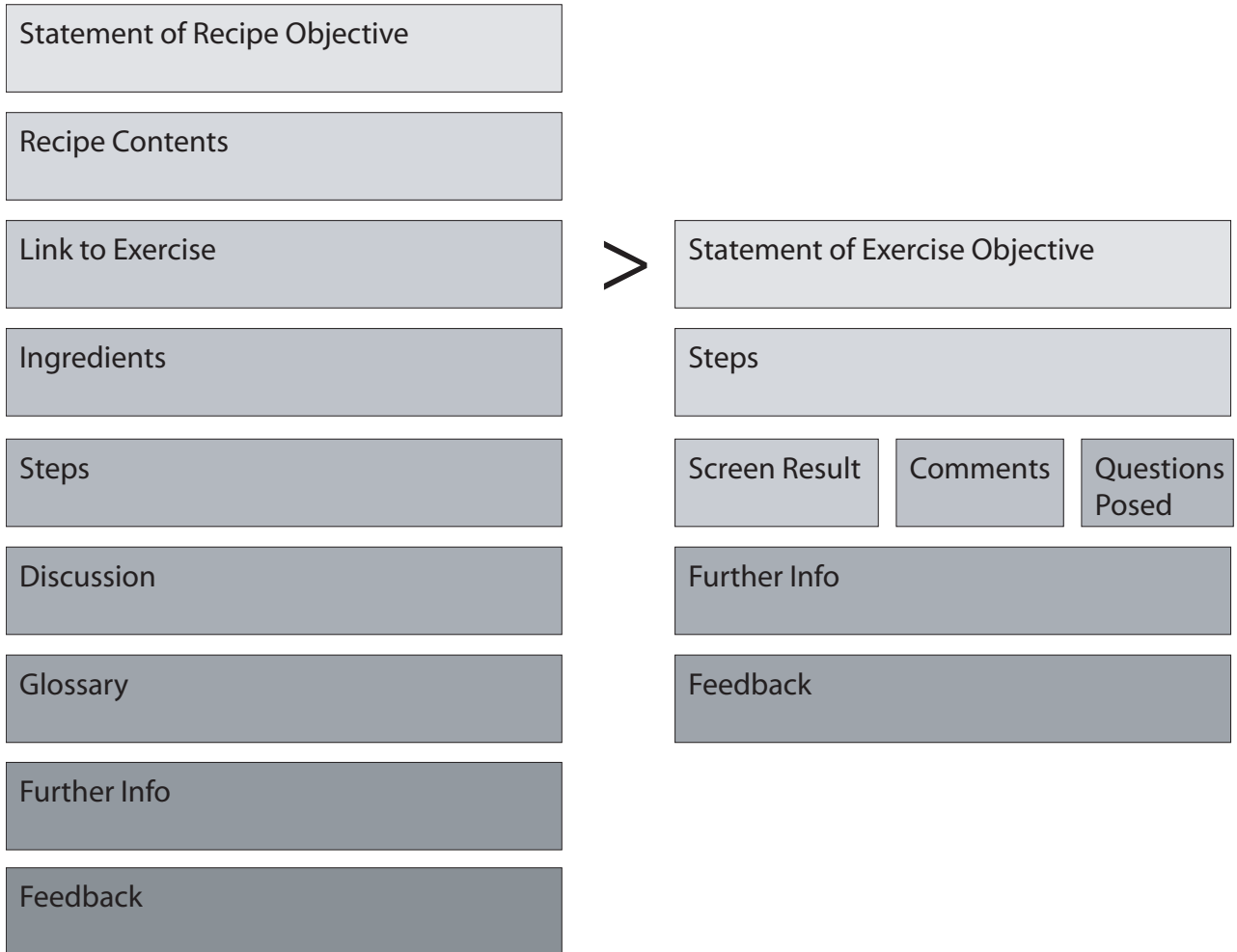
At the outset, the immediate advantage of the use of the term 'recipe' de-emphasized the technical, suggested familiarity and offered approachability to the novice user. Armed with familiarity with both the technical and non-technical sense of the recipe, we sought to capture the strengths of each and allow for maximum flexibility in the way in which users could interact with the product. This harmonized solution for self-guided instruction could meet the needs of users with diverse levels of computer experience, diverse demands of the tools themselves and provide applicability to diverse discipline-specific research tasks.

This article will discuss the way in which the metaphor was used to guide the construction of the text analysis recipe and outline a number of the challenges that arose and how they were met in this particular project with the object of sharing the methodology with others facing similar instructional challenges. The recipes developed in this project are freely available through the Text Analysis Developers Alliance (TADA) for perusal, editing and extension by the community.

Background – TAPoR Recipe Structure

Recipes are composed of the following:

Recipe Components

Statement of Recipe Objective	
Recipe Contents	
Link to Exercise	> Statement of Exercise Objective
Ingredients	Steps
Steps	Screen Result / Comments / Questions Posed
Discussion	Further Info
Glossary	Feedback
Further Info	
Feedback	

Further details of the components of a recipe are available at http://tada.mcmaster.ca/Main/RecipeStructure. Briefly, the recipe defines the specific task it accomplishes, lists the tools and inputs necessary to accomplish the task and then provides a list of the steps to accomplish the task. More fully:

1. a problem task statement such as "Identify simple themes within a text",
2. a list of ingredients such as 'an e-text and a List Words tool',
3. specific steps that use the tool to accomplish the task,
4. a glossary of technical terms new to humanists,
5. a discussion of particular features of steps and concepts in the recipe,
6. links to related information.

Early on a decision was made to abstract process into a recipe and then apply that abstraction to a hands-on exercise with a real-world task. This division itself offered users the opportunity to approach

the recipe down a path most suited to their particular needs and learning mode. A user could take the default path, which defined the objective (the dish), presented the tools (ingredients) and detailed the steps to follow to combine the ingredients. An experienced user could choose to jump directly to an exercise to see specifically how a tool is operated in the TAPoR and gain quick familiarity with its operation. A user more comfortable with reverse engineering could walk through the hands-on exercise and determine what the tools might accomplish for them. The user needing to understand the rationale behind the tool and gain familiarity with the broader theoretical concepts underlying analysis tasks could work the recipe backwards moving from glossary to discussion to abstracted process. The list of recipes itself provides a user entirely unfamiliar with text analysis with a broad perspective on the possible applied tasks that could be accomplished using TA tools in humanities research. Thus we integrated the abstract and the applied to provide maximum flexibility is user interaction.

The Challenges

Hitting a Moving Target – The Evolving and Diverse Experience of Users
The target audience for these text analysis recipes is diverse and encompasses users of varying experience with text analysis tools and with text analysis in general. Moreover, there is a creeping change even in the definition and capabilities which define the novice. Thus, we had to find a way in which to address diverse needs with the recipes while simultaneously allowing the recipes to evolve as the abilities of the target audience evolved. The self-guided nature of these recipes provided an obvious first step. However, the further decision to abstract the recipe and apply the exercise led to a crucial means of meeting diverse needs. Users have the ability to self-reflexively modify their own interaction as their experience increased. The decision to provide an abstracted recipe model separate from the applied exercise ensured that recipe would avoid being overwhelmed by a subtle upward creep in novice users' ability.

Recipes as a Collective – How do they interact? How can they be classified?
The recipes themselves were not developed in a vacuum independent of one another. As soon as a second recipe was contemplated the question of how or whether recipes should be linked or classified arose. Would there be a simple progression defined that implied increasing complexity or broadening or narrowing of approach to the tools themselves? We were reminded at this stage of a focus on specific research tasks as the leading determinant rather than the tools themselves. We were able to call upon a somewhat diverse group of individuals when canvassing for new recipe ideas. Thus we had a rich set of starting points. But how could the various research tasks allow for synergies?

Possible classification schemes for the recipes included difficulty and discipline, yet both were dismissed as they appeared to limit through restrictive predefinition the creation of additional research problematique and were somewhat arbitrary in nature. Recipes were classified according to the nature of what the objective accomplished – viz – location and identification of ideas; analysis of ideas or themes; or construction of new entities. This classification scheme does not imply experience or progression in a structured way. Instead it functions in a way similar to a kitchen cookbook and suggests a series of opportunities and experiences that can be accomplished and allows users to pick and choose and construct their own approach to the learning process.

The Use of a Wiki for Communication and Dissemination
The use of a Wiki, both for development communication and final dissemination of the recipe warrants some discussion. In the case of these recipes, the use of the Wiki (as opposed to a purpose-built website for example) provided limitations on the presentation technologies available. Although initial reaction was one of feeling constraint, the end-result may be a more positive outcome. The fact that significant graphic embellishment was more difficult within the wiki forced the adoption of a clean,

simple and straightforward presentation style. It further restricted the simple volume of textual information that could be presented effectively bearing in mind accepted principles of web-based information presentation. Thus language was carefully honed for brevity and the content itself was the clear focus.

Additionally, the Wiki focus on an outline based style was in harmony with the natural layout of a recipe and further reinforced this familiar and approachable presentation style.

Finally and perhaps most importantly, the wiki offers users the opportunity to contribute their own experiences as further recipes and thus to hopefully reach a wider audience through presentation of more varied research problem and their solutions.

The Importance of Personalization and Familiarity

The adoption of a familiar metaphor was one method employed to de-emphasize the technical nature of the processes being described and demonstrated. To further engage the user on a personal level exercises employ talk bubbles to provide feedback from the author to lead through the exercise. In a manner similar to discussion forums and increasingly in web chat tools, we include a photo of the author to reinforce the sense of an interchange and to maintain the narrative approach. This allows a sense of personalization and hopefully sparks familiarity within a templated environment.

The Opportunity

Pedagogically, the recipe structure encourages a self-reflective process and offers a flexible means to engage users of TAPoR regardless of previous experience. It is less intimidating due to the metaphor chosen to represent the process, the choice of language and the freedom for the user to define their pace. Additionally, the recipe construct allows that the user gains familiarity with the both the system and the principles of text analysis. The flexibility of the recipe and the accompanying exercise allows more experienced practitioners who may have greater familiarity with text analysis principles, but be unsure of the way in which they have been implemented in this particular environment, to quickly appreciate specific tool implementation.

Thus, flexibility and varied depths of instruction provide recipes with adaptability to a wide range of potential users. Additionally, as familiarity with the system increases, users can quickly scan recipes focusing on process rather than guided context.

Obviously, the use of the recipe metaphor cannot hope to meet the needs of all potential users of a text analysis environment. It is constrained by the way in which it represents the latitude of means by which a user may interact with the system. It cannot effectively demonstrate multiple ways to accomplish the same task. It tends to adopt a best means approach. Although the recipe has offered an optimal solution to the objectives of this project, the metaphor is clearly one which is not suited to demonstrating multiple paths to accomplish a task.

Moreover, one of the limitations of deployment through the wiki restrictions as implemented is the provision for discursive feedback. Two paths exist. One can comment on the recipe itself, but these comments remain separate from the process and are not immediately apparent to subsequent users. In the case of purely novice users, there is a requirement to understand wiki editing code. Perhaps more challenging to many users is the actual process of publicly editing another's work, something that can perceived as threatening until it realized that the initial contribution to the wiki implies the author's acceptance and openness to such editing. Publicly altering a recipe is a new and perhaps daunting challenge to the novice wiki user.

Present and Futures

The current recipes encourage modification and continued evolution. They are freely accessible and constitute a growing repository. They are applicable through their abstraction to text analysis in general and the TAPoR toolset is used only as an immediately accessible example through the exercise.

We hope to add to the variety of research tasks that can be accomplished using text analysis tools and to reach users in disciplines that have been less likely to use text analysis as a research tool, let alone be aware of how they might be able to do so.

More detailed explanation of recipe components and full instructions on how to contribute are available at the [Text Analysis Developers Alliance wiki](#). In fact, we have employed the recipe metaphor ourselves to the specific task '[construct a recipe](#).' The development of these innovative self-contained instructional paths offer useful case study in learning tools development as well as a model to augment existing methodologies for self-guided instruction. Although the recipes themselves are the outward product of this project, our hope is that some of these lessons learned and paths explored in the use of the recipe metaphor can enrichment the provision of self-guided computer instruction in other projects.