## an introduction to adaptivity

Many items we use on a daily basis in our physical world are tailored to our personal needs and desires. Furniture, food and clothing are a few examples of this: a tall person might prefer tables with a higher surface, bigger portions of food or needs bigger clothes as opposed to shorter people. But apart from physical items, our mental state is also subject to personal preferences. People have their own learning style, their own interests and their own approach to problem solving. More and more media content creators are beginning to understand this and try to create user-specific content. Yet there is still a lot of research and development to be done in areas such as e-learning, advertising and recommendation systems.

The field of adaptive hypermedia systems (AHS) focuses on developing platforms and techniques which further explore this digital personalization. It does this by adding adaptive behaviour to hypermedia content. The term hypermedia is an encapsulating term which covers audio, video, plain text, hyperlinks and other visual media. In this case hypermedia is typically viewed in an internet browser. The adaptive behaviour is based on environmental factors as well as the user browsing behaviour and history.

## adaptivity and GALE

The concept of adaptive hypermedia was first elaborately described by [BrLe93] in 1993. Soon after pioneering ITEs (Intelligent Tutoring Environment) containing adaptation functionalities, such as ELM-ART [BrEl96] were created. Since then a multitude of adaptive hypermedia platforms have been developed. One of these platforms is GALE.

GALE [SmBr11] (Generic Adaptation Language & Engine) is a strong generic platform for adaptation. It acts as a web server in that it serves web content to the client, but it also handles adaptation rules and expressions. Almost every adaptation technique can be applied in GALE, which makes it a truly generic platform.

GALE has been developed as a part of the GRAPPLE [BrAl13] (Generic Responsive Adaptive Personalized Learning Environment) project. This was a EU FP7 STREP[[1]](#footnote-1) project that ran from 2008 until 2011 in which academic and industrial partners collaborated to develop a generic adaptive learning environment and to integrate this with several learning management systems.

For content to be presented through GALE it needs to be authored by someone first. The format in which content needs to be presented to GALE is HTML combined with some specific GALE tags for further customization. These html pages are linked to concepts in an adaptation model which also has to be presented to GALE. This GAM (Gale Adaptation Model) file is written in a textual format which is aimed to be readable by humans and which describes a domain and its associated adaptation. However, it is difficult for non-expert users to create this file without more, extensive knowledge on GALE. Designing and creating such a GAM file containing all concepts is also known as “authoring”.

## Content Authoring

Currently there does exist an authoring environment for GALE which helps the user to author content. This environment is called GAT and uses a graphic user interface in order to author adaptive content. Time and use have proven that this environment does not meet the requirements of an authoring environment for GALE. An in-depth analysis of GAT is presented in [CHAPTER REF].

This calls for a new authoring environment in which lessons from GAT can be learned and fresh ideas can be put to an implementation.

In order to get new ideas and inspiration a company called “De Roode Kikker” has been involved in this project. De Roode Kikker is a company which created and maintains an educational platform. They are looking into the possibility of using GALE in order to make their educational content adaptive. That means their goal is a specific platform which is aimed at authoring content within their existing platform. Adaptivity will be focused within the area of Adaptive Educational Systems (AES).

The new authoring environment needed for GALE aims to be a generic platform with which a multitude of adaptive hypermedia types can be authored.

This means there is a discrepancy in wishes and requirements between both parties involved. Yet, this does not hinder the collaboration in terms of exchanging inspiration and ideas as well as providing mutual technical support.

So the goal of this project is to create a generic platform which helps content authors to easily create adaptive hypermedia without extensive knowledge of GAM. In the ideal authoring environment, the user will not have to deal with any kind of code at all. This platform needs to be generic in the sense that the adaptive content it provides must be adaptable, extendable. The material authored by the authoring environment must be field-independent. This means the tool must be fit to author, for example, educational content as well as a recommendations system.

ref:

[BrLe93] Brusilovsky, Peter, Leonid Pesin, and Mikhail Zyryanov. "Towards an adaptive hypermedia component for an intelligent learning environment." *Human-computer interaction*. Springer Berlin Heidelberg, 1993. 348-358.

[BrEl96] Brusilovsky, Peter, Elmar Schwarz, and Gerhard Weber. "ELM-ART: An intelligent tutoring system on World Wide Web." *Intelligent tutoring systems*. Springer Berlin Heidelberg, 1996.

[SmBr11] Smits, David, and Paul De Bra. "GALE: a highly extensible adaptive hypermedia engine." *Proceedings of the 22nd ACM conference on Hypertext and hypermedia*. ACM, 2011.

[BrAl13] De Bra, Paul, et al. "GRAPPLE: Learning management systems meet adaptive learning environments." *Intelligent and adaptive educational-learning systems*. Springer Berlin Heidelberg, 2013. 133-160.

http://cordis.europa.eu/fp7/ict/future-networks/funding-schemes\_en.html

1. Specific Targeted REsearch Project

   (http://cordis.europa.eu/fp7/ict/future-networks/funding-schemes\_en.html) [↑](#footnote-ref-1)