D 3.4
INTEGRATED REPORT ON FORMATIVE EVALUATION
RESULTS OF AUTHORING PROTOTYPES

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Abstract

This report summarises the results of IRIS third year’s activities and formative evaluations in the work package “Authoring Tools and Creation Methods”. Building upon design principles for Interactive Story Creation, which have been suggested and described in Deliverable 3.2, practical evaluation of these design principles included a number of case studies performed. The case studies involved also IRIS-external participants, and covered different scopes, efforts made, tool approaches used and work durations.

For each case study, a description of the resulting interactive story is given, as well as reflections and assessments on the design process. The case study results are also available online at http://iris.interactive-storytelling.de/.

The case studies are:

- “The Cruise”, collaboration with professional writer Georg Struck
- “Office Brawl”, interactive media project at the Hochschule RheinMain
- "Harold in Trouble", story development to explore and explain planning and debugging
- Summerschool Case Studies, performed at a 1-week summerschool with participants
  - “All about Peter” (Scenejo workshop)
  - “Diver’s Luck” (EmoEmma workshop)
  - “Plain Terror” (SceneMaker workshop)
  - “The Trick” (IDtension workshop)

Further, a description and evaluation of the conducted summerschool and a further tutorial are given. Also, the role of authoring tools in these creation processes is finally discussed.

Concluding, we reflect on how the design principles could be evaluated with the case studies and summarise the reached objectives of the IRIS project.
1 Introduction

1.1 Objectives

This Deliverable builds upon the previous results described in papers and IRIS reports (such as D 3.1 and D 3.2), taking these as a premise. Briefly summarised, these premises are:

- We see Interactive Story Creation as an endeavour to model a storyworld.
- The tasks of authoring differ from traditional linear storytelling in the following way: Whereas traditional storytellers explicitly describe sequences of events, interactive story creators describe a more abstract model including the conditions for the sequencing (or final forming) of those events. Translated into formal models, this potentially enables IS systems (story engines, software) to adapt the plot to user interactions during the experience.
- The authoring process potentially is teamwork with distributed author roles (conceptual authors, technical authors, engineers).
- We are looking for integrating views of story modelling at the conceptual author’s level. However, at the technical author’s level, there are expected differences how storyworlds are to be modelled, depending on a certain system used. We also expected some influence of the chosen system on the content conception, although ideally, it was felt that (in a potential future with available mature systems) it should be the other way around.
- We raised the hypothesis that an important aspect of closing the perceived gaps in creation has to do with also educating prospective authors (besides solving tool usability issues), and produced first educational material (see D. 3.2).

The hypothetical character of these principles afforded us to perform evaluating experiments of practical story modelling with target groups, using our material. Previous attempts of communicating the insights to interested audiences often suffered from the required and hardly available time to convey topics of such a great complexity. For example, one-day or even half-day tutorials and workshops at conferences had a great impact of visibility in the community, but raised the remark that the time was too short to cover the interesting bits.

This has led to a slightly adapted work plan focusing on longer lasting case studies of creation, conducted in the third IRIS year. The goal of a user-centred tool design approach has been shifted a bit towards periphery, without giving it up. On the side, authoring tools have been further investigated and developed, mainly with the goal to enable through them practical exercises of design principles. The main focus was on collaboration with different groups of authors using our concepts and these little tools. A long lasting cooperation with a professional writer, Georg Struck, has been continued in year 3. Further, three small groups (3 - 5 members) of media students were involved in media design projects using tools, building content and tutorials. Finally, a one-week summerschool has been conducted in August with the goal to attract authors, who eventually formed four interdisciplinary groups (with 4 – 5 members including different professions), each building storyworlds with our different approaches.

We take these case studies as a design-oriented research method. By reflecting the processes that we went through from different perspectives, we can provide a formative evaluation and assessment of our previous hypotheses. Quite naturally, we cannot avoid a certain subjectivity of the results. The groups had to be small, the time and effort spent to teach individuals has been high, and learning levels have been different from the start, so, random effects may influence the findings.

Therefore, the objectives of this report are to present the results in a descriptive way. In section 2, we briefly summarise the contents (resulting stories / applications) of the different case
studies and point to further links/material. Section 3 then focuses on the working steps and processes, and includes evaluative remarks that have been collected during and after these processes. Since the duration and scope of the studies differed, there is also a different level of granularity in these remarks. We conclude with statements about the lessons learnt and hypotheses on further directions. Section 3 also contains a summary of the conducted community events (of which the summerschool was also one) in terms of evaluation of the events themselves, including questionnaires and rough participant information. Finally, the role of authoring tools is commented in section 4.

1.2 Summary of Results

In brief, it can be stated that after the research done in IRIS, Interactive Storytelling as a research field still spans a variety of approaches and points of view. The problems of the community with the inclusion of authors tackled in WP 3 have persisted to exist throughout the project lifetime. Within international advancements, insights and discussions in this domain (e.g., discussed at interdisciplinary conferences such as ICIDS), a great deal has been contributed by IRIS. IRIS added knowledge by providing groundwork on which the community can further build in user-centred development processes.

Whereas before the project, there have been predominantly claims for (better) authoring tools addressing non-programmers, IRIS analysed that in order to build tools, creation principles have to be researched first. As a result of the early phases of IRIS, design principles have been enunciated based on a close examination of previously existing tools and interdisciplinary literature. In the last phase of IRIS, these design principles have been further investigated by practical exercises in case studies of authoring. The results of these case studies outline IRIS as a repository of sample processes, example tools and exercises that can further be used by the community.

In short, the main contributions have been:

- **Knowledge, new insights**
  - Design principles for IDS, enunciated, tested and put into practice with examples. They are built around the insight that in Interactive Storytelling, we need to practice “story modelling” as a unique skill that augments (and sometimes replaces) traditional ways of narrative storytelling.
  - Theoretical foundations targeted at creators (tutorial material).

- **Artefacts**
  - Repository of simple tools and exercises with these tools (incl. non-software tools).
  - Tutorial material, slides, tools and exercises, descriptions/manuals.
  - Link collection.

The research community and other interested parties gain access to most of the produced material via the repository of IRIS authoring concepts, http://iris.interactive-storytelling.de.
2 Case Studies of Authoring and Creation

In this section, the case studies of interactive story creation conducted in the last IRIS year are briefly summarised. Where applicable, links to further detailed material are given, such as papers or Online resources. All case studies are also described online at http://iris.interactive-storytelling.de, thereby grouped according to their specific approach to “storyworld modelling”.

Although we have been interested in common ground principles, independent of tools to be used, we were increasingly aware that in a case study that shall lead to the playable artefact in the end, the knowledge of required formal structuring to achieve effectiveness is crucial. Therefore, and mainly for pragmatic reasons, the case studies have been structured in exercises around a specific target system (equivalent to a story modelling approach).

Table 1 shows an overview of all studies. Case studies also differed by their duration, scope and participants. In Table 1, we differentiate between target authors and IRIS participants. We assume that in most cases, IRIS participants had roles of facilitators or sparring partners, and target authors were either – in one sense – the learning “trainees”, or – in another way – also providing feedback and insights into creation processes. Concrete formative evaluation reports, findings and hypotheses on future work are given in section 3.

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<th>Case Study Titles</th>
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<td>“Harold in Trouble”</td>
<td>Scope: ~ 3 months individual collaboration between IRIS partners HSRM/ULR Target author (partially): Georg Struck IRIS: Steve Hoffmann, Ulrike Spierling, Kim Dung Dang, Ronan Champagnat</td>
<td>EmoEmma (TEES), Linear Logic (ULR) Results: Tested planning domain; Linear Logic models and sequents, paper at ICIDS 2011.</td>
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<td><strong>Summerschool case study titles</strong></td>
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<td>“All about Peter”</td>
<td>Scopes, each: 1 week summerschool workshop with fixed group of participants (for all authors, see below). IRIS (facilitators): Ulrike Spierling</td>
<td>Scenejo (HSRM)</td>
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<td>“Diver’s Luck”</td>
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<td>“The Trick”</td>
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Table 1. Overview of the case studies
2.1 “The Cruise”

“The Cruise” evolved over several versions (“The Downfall of Frank Jefferson Junior”, “The Reunion”, and “The Cruise”) and is the result of cooperation between the University of Applied Sciences Wiesbaden (HSRM), the University of Augsburg (UOA), and the professional author and scriptwriter Georg Struck. The goal was to create an interactive story for realisation with UOA’s SceneMaker and hereby explore the creation process with finite states, test and improve the found creative principles and give feedback on the authoring process and tool. Details on the process can be found in section 3.1 where a report about the cooperation is given.

The story: The player/user finds herself/himself accidentally on a boat full of dangerous criminals. When his friend is thrown overboard, she/he quickly realises that her/his only chance of survival lies in pretending to belong there. Since this is a reunion of a mafia family where everybody knows everybody, the only solution offered by a helping character (the mafia don's daughter) is to play the role of a long-lost mafia family member who went missing on a storm years ago. If the player fails to enact his role convincingly, she/he is thrown overboard. The user may interact with the other characters by typing in utterances. A photo album of the family, annotated by the helping character, plays a crucial role as a prompter for the player to guess keywords to mention and answers to give in the conversation.

Further information about this storyworld can be found online in the IRIS authoring repository in the section “Modelling a storyworld based on finite states”.

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1 Storyboard artist: Jennifer Hicks
2 iris.interactive-storytelling.de
2.2 “Office Brawl”

This case study aimed at the creation of an interactive storytelling game consisting of verbal conversations between the user and two virtual characters. Further information can be found on the website of the Scenejo project. Impressions of the gameplay are given by an online accessible demo video.

The study has been realised in the scope of a facilitated semester project by students in the course of study “Media Management” at HSRM in Wiesbaden. Theoretical and practical aspects of modelling a conversational storyworld – based on the educational material of IRIS year 2 – have been covered by lectures in the course, interwoven by practical steps of creation. In parallel, a new version of the IS system Scenejo has been developed, newly equipped with a realtime video playback client that allows to seamlessly connect and play atomic video snippets for single utterances of the virtual characters (see Fig. 2). Targeting this platform, the students not only designed dialogues and implemented them, but also organised recordings and produced the video snippets with the commercial photo animation tool “Crazytalk”.

The study: The user is in the role of a project manager confronted with a serious argument between his team members Ben, chief programmer and “the technical guy”, and Lucy, creative director and the “artist” (see Fig. 2). They express strong or weak arguments, or offensive remarks, in a self-referential discussion about Interactive Storytelling, especially about Scenejo and its visualisation features. The user has to calm them down every time the argument heats up, influencing counters for Ben and Lucy. Depending on these, the development of the discussion and ending can be influenced. User utterances are to be typed into a text field, while Ben and Lucy are rendered by real-voice dubbed video snippets depicting animated sequences.

“Office Brawl” was successfully submitted and presented as a demo at the ACE 2011 conference in Lisbon (Glock et al., 2011). Further information about this case study can be found online in the IRIS authoring repository in the section “Modelling a conversational storyworld”.

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3 http://scenejo.org/ (Link to Scenejo homepages)
4 http://www.youtube.com/watch?v=cIf86hmzc4E - (also accessible via the IRIS authoring repository and the Scenejo pages)
5 http://iris.interactive-storytelling.de (IRIS authoring repository)
2.3 “Harold in Trouble”

The initial story “Harold in Trouble” was developed in 2010 together with author Georg Struck to explore not only the creation process and the use of paper prototypes, but also to find ways to educate authors in the complex principles of AI-based planning in a playful and understandable way (Hoffmann et al., 2011). The result was a card game (available printer-ready for download from our repository) which was used in tutorials at ICIDS 2010 (Spierling et al., 2010), ACE 2011 (Spierling et al., 2011) and our Summerschool 2011. The story was also implemented in the EmoEmma Authoring Tool to demonstrate the advantages and benefits of using planning software compared over manual processes in authoring.

In the last year, we went a further step to explore the practical application of Linear Logic methods (developed by IRIS-partner ULR) for authoring. Especially, debugging processes in the technical authoring of planning-based interactive stories could be explored (Dang et al, 2011).

The story: A clumsy wannabe womanizer and secret agent assistant “Harold” has to stay calm during a garden party of a super villain, while his boss, the top agent Number Seven, negotiates with the evil Silvertoe. Trying to seduce a woman he creates chain reactions of chaos, resulting in raising Silvertoe’s attention and anger level. In the realised version as a game explaining story planning techniques, the user acts as a “co-author” of the plot sequence in the actual role of the planner, and can influence a variety of event sequences.

Further information about this case study can be found online in the IRIS authoring repository in the section “Modelling a storyworld based on planning”.

6 iris.interactive-storytelling.de
2.4 Summerschool Case Studies

At the Hochschule RheinMain (HSRM) in Wiesbaden, a summer school on “Interactive Story Creation” has been conducted from 19th to 24th August, 2011. A more detailed report on the organisation and schedule, the participants and event evaluation can be found below in section 3.5. The week was organised in plenary lectures (half-day) and half-day group workshops. Each group worked with a certain story modelling approach associated with an IS system / tool provided by IRIS for technical realisations of the conceptions: Scenejo, Emo-Emma, SceneMaker, IDtension. Before technical implementation of feasibility studies, the work mostly started off on flip charts and by paper prototyping. The groups were facilitated by IRIS participants (professionals in the tools, see Table 1 above) to give instructions and cooperate in the conception. After one week, all groups came up with a presentation of an interactive story concept. During the week in daily “lightning talks” with flipcharts, intermediate steps of the modelling process were communicated in the plenary. In the following, the resulting storyworlds are presented as case studies typical for a certain modelling process. Again, all storyworlds are described online at iris.interactive-storytelling.de, sorted according to their modelling approach taken. The authors of the stories are summer school participants.

2.4.1 “All about Peter”

“All about Peter” is the story result of the workshop "Modelling a conversational storyworld" using Scenejo. A test scene could be quickly implemented from scratch and played back in Scenejo, using the default “talking heads” visualisation and audible text-to-speech.

![Fig. 4. Running prototype of “All about Peter” (Scenejo, 3d representation)](image)

The story: The player visits a charity party where everybody seems to know Peter, the party host and fund raiser, who is absent in the beginning. Mary, our friend who has dated Peter...
recently, has asked us to visit the party to find out if Peter is a trustworthy guy. The user at first knows nothing about Peter, but has to find out using gained information to dig even deeper into the interesting and adventurous life of this mysterious Peter. The user interacts by typing in utterances.

Authors: Giuliana Dettori, Jamal Esenkanova, Christoph Knauf, Sebastiano Marvin (IRIS Facilitator: Ulrike Spierling).

2.4.2 “Diver’s Luck”

The story “Diver’s Luck” is the outcome of the workshop “Modelling a storyworld based on planning”. During the workshop, it was implemented in the EmoEmma Authoring Tool that was finally enhanced with a user interface to show pictures and text (see Fig. 5).

Authors: Angelo Ciarlini, Oliver Schneider, Michael Straeubig, Emma Whittaker (IRIS Facilitators: David Pizzi, Stefan Rank).

2.4.3 “Plain Terror”

“Plain Terror” was created during the workshop "Modelling a storyworld based on finite states". It could be partially implemented in SceneMaker, also being enhanced ad-hoc with new interface elements that came up to be important during the story conception (for an example see Fig. 6).
The story: The user finds herself/himself in the middle of an aircraft hijacking. The goal is to mobilise a resistance group among the close-by passengers to overwhelm the terrorist. She/he is assisted by a retired air marshal sitting next to him. The user’s task is to convince the passengers around her/him to overcome their fears - or to prevent a sudden irrational reaction - to reach a critical amount of helpers and tools that would lead to a positive ending. The user has to react under time pressure and an ever-present danger of being caught by the terrorist. Fig. 6 shows the adapted user interface in which the user can choose the character she/he wants to talk to and type in utterances.

Authors: Daniela Genz, Karim Omar, Cesar Pozzer, Thomas Römer, Georg Struck (IRIS Facilitators: Steve Hoffmann, Gregor Mehlmann).

2.4.4 “The Trick”

The story “The Trick” is the result of the workshop “Modelling a storyworld based on goals, tasks and obstacles”. It was partially implemented in the IS system IDtension (see Fig. 7), by building upon some initial default material.

The story: In “The Trick” the user plays Konrad, a speaking mouse that has to help Sam who works at a circus as the cleaning boy to deal with important decisions for his future life: leaving the circus, staying a cleaner or trying to become the assistant of the suspicious magician. The user has to learn about the secrets of the magician and to convince Sam of the possibly dangerous outcome of his decision to join the magician. The user interacts by choosing options from the text-based interface of IDtension, which is done by clicking on the coloured words in the text.

Authors: Nina Dvorko, Thomas Endter, Martin Ruskov, Claudia Söller-Eckert (IRIS facilitators: Nicolas Szilas, Paolo Petta).
Everybody is in the circus. Present characters are Sam, Arkon, Alice, Mr. Ed, Chip. You are acting with the scene.

You ask yourself: "Why not give Sam the old newspaper article?"

You decide to provide Sam with the old newspaper article. There are different ways of doing it. Sam decides to convince Mr. Ed that the trick is dangerous.

You read the old newspaper article that circulated many years ago.

While looking at a pile of old newspapers, thrown away in the corner, you find the old newspaper article about a fire, caused by a trick with a smoking liquid.

Fig. 7. “The Trick” in IDtension
3 Evaluation Results of Case Studies and Workshops

This section presents evaluation results of the case studies and workshops. The case studies – here first structured in the same way as in section 2 – are evaluated mostly in the form of personal reflections and reports of their participants. Naturally, the scope, depth and extensiveness of reflections varies between studies, depending on the nature of the collaboration and even the content of the conceived story matter. At times, personal hypotheses on specific design ideas for one storyworld get easily intertwined with attempts to generalise design/creation principles. Therefore, the reports should be read with this in mind, especially in the light of existing disclaimers regarding even more established story design principles, which are never meant as “prescriptions” or “rules” to follow. The goal of this assessment is to report on what has worked, and what did not or was difficult. More collected material can be found in appendices or on request. Finally, the subsection 3.5 also generally describes and evaluates the workshops as community events.

3.1 “The Cruise”

“The Cruise” was a collaborative project of IRIS-partner HSRM (Hochschule RheinMain) together with the professional author and script writer Georg Struck and IRIS partner UOA (Uni Augsburg). The collaboration with Georg Struck already began before “The Cruise” in the context of creating the card game “Harold in Trouble”. There, we explored the acceptance and effectiveness of our previously postulated creation principles of “abstraction” and “conditional events” using planning philosophies, see Deliverable 3.2. (IRIS-WP3, 2010) and (Hoffmann et al., 2011). The following collaboration in “The Cruise” dealt with issues in the storyworld’s concept that pointed us repeatedly also to two of our other previously proposed creation principles: “Including the user from the start” and “Interaction design” (as it should be part of conceptual authoring).

As it turned out in the collaboration with Georg Struck, imagining the user experience was also the most important starting point for this writer, since he was trying to build upon his experience as a game writer. From the outset, the story development focussed on the questions ‘why should the player act?’ and ‘what can the player do?’.

After a long phase of artefact development that included the drafting and testing of three different (evolving) designs of the interactive storyworld, the collaboration team evaluated the encountered problems that made redesigning a necessity, in order to arrive at potentially generalisable findings. These three design versions are described in section 3.1.2, and evaluation remarks on the work method are summarised in section 3.1.3. Both summary sections build upon more detailed original material that can be explored from appendices. The following section 3.1.1 first gives an overview of the whole collaboration.

3.1.1 Overview of the Collaboration

The collaboration with Georg Struck was in principle performed in a little team with distributed roles. Georg Struck was the conceptual author (the “writer”-role), Steve Hoffmann (HSRM) the technical author (the “operator”-role), Gregor Mehlmann (UOA) the tool builder and story engineer of SceneMaker, and Ulrike Spierling participated in discussions as a facilitator and researcher. All members were motivated to share and change their points of view.

Fig. 8 gives an overview of the main work phases, showing important workshops with their resulting materials in chronological order. These result scripts of the versions and additional material can be found in the appendices. The workshops were complemented by several meetings and a high number of teleconferences.

In parallel to the work on “The Cruise”, during summer term 2011 a group of HSRM media management students learned to use SceneMaker (supported by Gregor Mehlmann and Steve
Hoffmann) with the goal and result of producing a self-learning tutorial. This tutorial has further-on been consulted by Georg Struck and participants of the Wiesbaden summerschool in August, while it supported a quicker start-up for practice and better understanding of the technical author’s constraints.

During and in parallel to the creation of the different versions, feasibility studies for their implementation in SceneMaker have been done, pointing out problems to be solved at a story modelling and implementation level. While the beginning started out with the assumption of using UOA’s realtime 3d engine AAA for playback, with the second version that idea was critically challenged. The 3rd version of the story draft is now the most promising to be realised. After its completion before the August summerschool, fine drafts were created and another feasibility study for the implementation in SceneMaker was performed. The most important further necessary technical modifications included a new interface design of the authoring tool and playback prototype. Also, characters and visuals were designed for the potential final representation of the IS artefact. This material can also be found in the appendices (see list), including visuals created by the comic artist Jennifer Hicks.

As mentioned before, the evolution of the IS artefact centred around the two key questions ‘what can the player do?’ and ‘why should the player act?’. Fig. 9 shows an abstracted overview of this ‘narrowing down’ process of the three versions, aiming for a challenging and enjoyable user experience that would have a manageable size and complexity for a final implementation. In the next section, this process is explained by using the storyworld example.

Each draft aimed to simplify
• the player’s scope of action (what can I do?)
• the player’s motivation (why should I act?)

Fig. 8. Overview of work steps, from end of 2010 through fall 2011

Fig. 9. Abstract summary of the storyworld evolution
Fig. 9 implies that the motivations for iteratively abstracting and redesigning were both technically motivated as well as conceptually. While simplifying the scope of actions for users, not only implementation issues could be solved more easily, also the perceived motivation for interaction was made clearer from the script outline.

Fig. 10 shows a structure of the story modelling process using the 3rd version drafts. Readable details may be explored from the appendices documents (A.4); however, this overview shows that after analysing a linear script, event and dialogue structures were extracted and transformed towards more dynamic potentiality represented by state charts, finally having to meet the implementation model of SceneMaker. Within our iterative process, this story modelling and abstraction of the first draft versions did not always lead to “successfully” completed models for implementation, because on our way there, problems with the story were identified too soon that called for more fundamental changes in the draft at first. This may also show that story modelling requires analytical approaches that identify conceptual flaws before implementation.

3.1.2 Development of the Storyworld and Design Document

The resulting design document was created in three drafts. Each draft aimed to simplify the player's motivation (‘why should I act?’); and the player's scope of action (‘what can I do?’). In this section, these concrete story content details are explained.

3.1.2.1 Simplifying the Motivation

Each draft of the game design bible aimed to simplify the motivation to act.

In the first story (“The Downfall of Frank Jefferson Junior”, see appendix A.1), the player is motivated to get revenge at an old classmate for humiliating him at the entrance to a class reunion. The player is then given a chance to humiliate his enemy in revenge, by revealing shameful secrets to his peers.

There is no risk, if she/he does not act.
Fig. 11 shows a story map with relationships and critical states as goals of the characters. In all three versions (compare also Fig. 12 and 13), the user is supposed to play the “Ben”- character, while the constellations (and names) of other characters slightly change. In Fig. 11 – 13, also certain modelled story state “levels” are pictured that play an important role when being influenced by user input (such as, chattiness level, convincement level, or trust/mistrust level).

In the course of the first story, the motivation is kept alive by reminding the player that the old classmate has always been bullying his character; and by reminding the player that his arch enemy is now with his former girlfriend.

After closer analysis and drawing from his experience, the writer Georg Struck felt that the motivation would be too negative. Players would probably feel that revenge was destructive and no ‘fun’ to enact; and would miss any constructive motivation for action. Also, the writer felt that players might worry about the attractiveness of the player’s role. The player character was presented as a social failure, and in acting out his revenge, seemed to act from a sense of hurt pride and, ultimately, weakness.

**1st Version: “The Downfall of Frank Jefferson Junior”**

![Character constellation diagram](image)

**Fig. 11. Visualisation of the character constellation of the 1st draft**

**In the second story draft** (“The Reunion”, see appendix A.2), the player is again humiliated at the entrance to the reunion by his enemy; only this time, the humiliation is tied to an explicitly stated, simple reasoning: because nobody knows what the player character did in Greece since his boat got stolen, it is assumed that he has become a beach bum. The player is then presented with a chance to prove these allegations wrong by inventing a fictional career for himself, showing off his new boat and a startling, impressive life as a smuggler.

The writer felt that players would appreciate the role of a wealthy and successful smuggler as more fun to enact. Showing off to his former classmates with a made-up role made the character clever and anarchic; still, the motivation might still be perceived as ‘defensive’. The player still only reacted to the allegation of being a social failure. On further analysis, the writer assumed that players would want to inhabit a more dignified character that was not dependent on his peer’s admiration and search for alternative things to do apart from showing off.
In the third story draft (finally “The Cruise”, see appendix A.3), the player finds himself on a boat full of dangerous criminals, after a case of party crashing gone seriously wrong. When his friend is thrown overboard, she/he quickly realizes that his only chance of survival lies in pretending to belong there.
Since this is a reunion of a mafia family where everybody knows everybody, the only solution offered by a helping character (the mafia don's daughter) is to play the role of a long-lost mafia family member who went missing on a storm years ago. If the player fails to enact his role convincingly, she/he is thrown overboard.

In the first two drafts, there was no risk if players failed to act. The reunion offered no danger, even if players chose not to take revenge. In this draft, players are forced to play the role of smuggler, if they don't want to die, leaving no room for doubt or second thoughts. The story offered players with a compelling reason to act, and in a very specific manner – i.e. playing a very specific role. Getting to this point demanded an equal amount of simplification regarding the player's scope of action.

3.1.2.2 Simplifying the Scope of Action

As with the motivation, the development of the game design aimed at simplifying the goals, strategies and actions of the player.

In the first story draft, the player’s goal was to triumph over his old enemy Frank and take revenge for his bullying.

The strategy (suggested by assisting character Jill) was to unearth Frank's dirty secrets. This could be done by teasing secrets from the other guests. Jill demonstrated three different sub-strategies to heighten the ‘chattiness’ of party guests: the player could flatter other guests on their successes; tell them dirty secrets about other guests; or tell them about the betrayal of their own dirty secrets.

In the end, the player could learn about Frank's affair with his best friend's wife (Lydia); and about a hit-and-run accident, leaving his sister-in-law Jill crippled. Exposing his dirty secrets to the other guests, the player could destroy Frank socially.

The first draft demonstrated how hard it was to find ‘social dynamics’ that were simple yet interesting enough for social gameplay. The writer felt that ‘teasing secrets from people’ was a very difficult task that would leave them clueless even in real life. Players would need the demonstration of assisting character Julia to understand that flattering or gossiping made NPCs disclose confidential information. But how much flattering was needed until worthwhile secrets were disclosed? Was there flattery that was more effective and how could this be discovered? Where could players acquire valuable gossip to pass on? Would any gossip do?

The writer felt that the player's scope of action was too unpredictable. The introduction and visualisation of a ‘chattiness’-level improved this situation only superficially.

It was still hard to gauge dialogue partners – which actions would be more or less effective? Also, interestingly, the choice of many different strategies was felt to confuse rather than improve the playing experience. Finally, having to watch Jill demonstrate player strategies would slow down the gameplay and leave players inactive. Was there a course of action that needed no demonstration and would be self-evident to the player?

In the second story draft, the player’s goal of triumphing over his bully Frank was kept the same but the strategy was simplified: the player could prove his critics wrong by playing the role of a wealthy yacht owner and smuggler. His scope of action was simplified to the point of a single speech act: showing off. An assisting character (Barry) suggested the role to the player and helped him fill out the role (providing a captain’s hat, pictures of the boat, business cards and a fake smuggling career).

In every dialogue, the player was invited to improve his showing off – she/he was invited to add new descriptions of his wealth, as well as tell stories about his smuggling adventures.

While the player’s scope of action seemed sufficiently simple on first inspection, a more detailed modelling of the story in an example scene showed problems. Tasked with envisioning different player inputs, it quickly became evident that showing off still provided the player with a very vague call to action. What type of showing off was expected? Should she/he boast about golden faucets or about frequent travels to St. Moritz? Or should she/he tell crazy stories about his
adventures in the smuggling business? The range of possible actions felt discomforting. Asking the other collaborators to provide some example input yielded similar results. They expected a clearer suggestion how to act. Particularly, they wanted to know what type of action would be rewarded with interesting reactions by the system, e.g. should they indulge in outrageous storytelling or in detailed listings proving their wealth? The brief survey suggested that players would be asking what to do, apparently aware that the application would only provide interesting responses to a very narrow scope of action.

This concern addressed another side to the problem that proved even more discomforting. Every possible action of the player would have to be accounted for. But parsing the simple act of showing off one’s wealth by describing the yacht proved to require tremendous authoring effort. Even if the powerful, but complex use of a semantic parser was eschewed in favour of simple keyword detection, making the SceneMaker tool detect a single keyword required a minimum of 15 minutes authoring effort. Given that the initial, simple list of possible yacht descriptions provided by the writer already covered more than 20 keywords, this amounted to a days’ work for a single dialogue exchange. And there would be much more keywords to follow in scenes where the player was invited to boast with his smuggling exploits.

The writer and system designers had expected the authoring to be labour intensive, but the actual effort required for the simple example scene surpassed even the worst expectations by far. It became clear that the game design needed some radical rethinking and simplification if it was ever to reach a producable stage.

The player’s scope of action needed to be narrowed down even further.

In the third story draft, the idea of offering the player a role in the story was developed further to address the problem. The player’s motivation was simplified to the point where she/he now had to act the role of a smuggler convincingly in order to survive.

What was needed was a device that would limit the scope of action of the player enacting the role. The solution was to give the player a ‘photo album’ containing scarce, highly limited information on his role, showing pictures of one Greek smuggler Ben, as well as written annotations about his friends and enemies.

The player was invited to use this information – and only this information – to enact his role. This was motivated by the story – the player character possessed no prior knowledge about his ‘cover’ and had very little time to acquire any information. His only hope of survival was to take the information offered by a helping character (Julia, the daughter of the mafia boss). Straying outside the limits of the scarce photo album information yielded ‘wrong’ enactments of the role in the eyes of the other cruise guests, heightening their mistrust and ultimately leading to a game-over scene where the player character was thrown overboard.

This design decision solved the issue that the writer and the team had with all previous versions of the IS artefact. They now felt that they knew exactly what to do and what not to do. There was a clear winning goal (surviving the 15-minute passage to the next harbour) as well as a clear game-over condition (being found out as an impostor and thrown overboard); the motivation and the scope of action were in line with each other – the only chance of surviving the cruise lay in adopting the role of long-time missing mafia family member Ben. The means of acting out the role were also clearly given with the photo album and assistant character Julia’s annotations. Users had direct feedback whether their input brought them closer to their goal or towards the game-over scene through an interface element that showed the ‘trust’ and ‘mistrust’ values of the other guests. If the mistrust value reached a certain threshold, it was compared to the current trust value in a judgement scene and the player either succeeded or lost the game.

This story design also alleviated the authoring bottleneck encountered in the example scene. It effectively limited the player’s scope of action to using the information presented in the photo album in the ensuing dialogues. The story made this limitation feel natural and challenging – the player found himself pretending to be someone that she/he knew hardly anything about. Having to make the best of his limited information and faking his way through conversations using only his scarce knowledge was now the central task not only of the game’s interaction, but also of the fictional story.
Figuratively speaking, this solution turned the problem on its head. If player input could not be parsed, this could now be perceived as a fault of the player and not of the system. Player input could thus also be foretold in a better way. In designed dialogue situations, the actions of the NPCs could create an expectation how the player character had to react in order to stay in character. This should limit the player’s scope of action sufficiently to enable the economical authoring of the artefact. We want to draw attention to the fact that a story device solved an authoring problem that initially seemed to have only a complex technical solution. In the chosen solution, the game could be kept at the desired length of 20 minutes without sacrificing freeform text input or adding additional technology. We suggest that this story-based solution is highly relevant to any system employing freeform text input.

3.1.3 Summary of Reflections

Concluding the study, we provide a merged summary of the team members’ reflections about the collaboration process in this case study. This assessment of the process has been done to some extent in individual comments and finally in a joint open discussion. The reflections, partially with personal accounts and assumptions can be found in appendix A.6. Although it was great teamwork, there have been different opinions on a variety of issues. These may reflect the team members’ different professions and roles in the process. The “assigned” roles (Georg Struck: conceptual author; Steve Hoffmann: technical author; Gregor Mehlmann: story engineer; Ulrike Spierling: facilitator/researcher) were not affiliated with strict task assignments, though. In fact, everybody was part of the general conception phase, as most of the brainstorming of ideas happened with at least three of the participants at a time (see section 3.1.1). The written outlines as results of this conception (Appendices A.1 to A.3) were produced by Georg Struck.

The following is a selection of the most significant common insights, or issues that were even a source of friction. The selection has been made based on what we expected to be of general interest for similar projects.

Complexity of the Initial Vision

The first premise, to build a new story upon the “Beergarden” demonstrator, created high expectations of the writer regarding the outcome – a lifelike social setting in which the player could interact mostly by free text input. However, this vision stood in conflict with the project’s engineering resources and the available capabilities of the targeted system. The first full versions of the story were too complex for the graphical representation regarding the variety and action possibilities of the characters. Resolving this issue was a more difficult process than expected by the IRIS members. It even sometimes caused resistance within the team and could only be overcome after having experienced the partially predictable failures. The solution was marked by a steady “narrowing down” process to simplify the story and move it closer to a level at which it would be implementable. This simplification process took multiple iterations.

Perfectionism

The implementation was further delayed by the writer’s high aspirations to make the whole story feel “organic” – to fit everything well together, by trying to let the technical constraints disappear through blending them into the interactive setting of a story that does not provoke questioning. It turned out that the IRIS team members were indeed less interested in a certain type of perfect story than in the research of a perfect story modelling process with finite states – especially in the face of the available resources. This vision of obtaining a playable story prototype had to be given up at one point. However, positively speaking, even the non-playable result gave us insights on Interactive Storytelling at a different level than expected. The result has actually the potential to be produced at a later time after IRIS.

Implementation and Representation

Because Georg Struck was known as highly knowledgeable about the state of the art in IDS, only late during the creation process the team became aware about misunderstandings regarding the system capabilities. Knowing scientific papers and talks from ICIDS conferences created the assumption that such technology could quickly be integrated. The writer’s storyworld conception targeted a way bigger production/implementation team than IRIS could offer. This
regarded the structure of the story, but even more important, the envisioned representational features, such as graphics, voices, video integration and natural language recognition facilities.

On the other hand, the invitation to use tutorials for hands-on experiences with the SceneMaker authoring tool could not accelerate the understanding of story modelling within the constraints. The tool presented a high barrier by operating on a rather low conceptual level (state machines). The team concluded that a strong demand for a tool to alleviate this point would be to offer reusable higher level patterns. It has to be added that at the end of the process, we arrived at a reasonable result, only at a later point in time than we had hoped for.

Theory and Practice

Some of the difficulties that occurred, especially those with including natural language input, did not come as a surprise for the IRIS team members who communicated theoretical principles and constraints of dialogue modelling – for example, the necessary abstraction of user input speech acts. However, during the design process, it was necessary for Georg Struck to explore the boundaries of these constraints nonetheless. The result is a formulation of “lessons learnt”, which he contributed as a lecture to the summerschool in Wiesbaden (see also Appendix A.5).

We can assume that exploring the boundaries will be of interest for future authors, regardless of existing theory. Concerning the actual usability of the affordances to know what can be said, evaluations are still to do.

Player Role

A “golden thread” accompanying the whole creation process was the challenge to give the user a good idea of the player role. This was harder than expected, showing that interaction design is a crucial part of the process. The clever design of affordances and feedback is originally the domain of interaction designers. However, with regard to Interactive Storytelling and the claim to interweave interaction and story, we felt that it is not effective to regard it as a separate domain.

Story Modelling and Story Representation

In the facilitation of the process by the IRIS members, story modelling was thought of as – at first – independent of a very detailed representational level (such as, the exact looks of characters), and only technical representation constraints were assumed to be interesting. The writer reported that he always thinks of a story including its exact representation, not taking into account visualisation constraints. This caused some of the misunderstandings (also reported above concerning the 3D representation) or even a dilemma. By trying to give the best concrete impression of the intended experience in the (linearly) written design draft, it became harder to see the model behind the story. Sketching the model as abstract diagram seemed to put important elements of the intended storyworld at stake. Resolving this was a learning process.

3.2 “Office Brawl”

Media Management is an interdisciplinary Bachelor degree programme at Hochschule RheinMain (HSRM). In the 5th semester, students have to complete an extensive media project in groups. This was used to advertise an Interactive Storytelling project with the support of IRIS. Students should explore authoring processes with Scenejo, building upon the educational material created previously. Our goals were a), to strive for a playable example as a potential result and b), to evaluate the educational concepts and the freshly redesigned Scenejo authoring tool. The five students (Florian Glock, Anne Junker, Marina Kraus, Christian Lehrian, Alexander Schäfer) were supervised by Ulrike Spierling and Steve Hoffmann.

At the end of the semester, the students successfully created a first implemented version of the dialogue in Scenejo (ready to be played back with Scenejo using the default 3D talking heads visualisation), and a comprehensive set of video snippets as assets for a realisation with a video client. That video client has finally been implemented over summer to be presented at ACE 2011 in Lisbon. Before its demonstration, some more fine tuning of the content was necessary.
3.2.1 Design Steps

The semester duration was 14 weeks with a strict deadline. The course started with lectures and independent research about Interactive Storytelling, as the students were newcomers to the field of computer game design or story writing (however, they had an educational background in media conception, design and film making). The first steps were brainstorming ideas and the group decided to divide the project up into three parts: dialogue conception, Scenejo implementation and video production of the representation. This is illustrated by Fig. 14.

Fig. 14. Project tasks: Dialogue concept, authoring, and production of the representation

In all the three aspects, researching the methods to use was the first step. Dialogue creation depended upon creating a story setting and characters, approached by brainstorming. For Scenejo authoring, very early the students used the SAT authoring tool with the help of the available tutorials and exercises. For the first 4 weeks, the goal was to get one simple test conversation running (including its conception), before starting over with the actual design. The third aspect, the representation, required research in setting up a production line to create atomic video snippets, including its targeted interface in a web browser. Since it was expected that a seamless concatenation of the videos may be difficult to achieve, also non-realistic animation techniques have been explored.

Fig. 15 shows an ideal design process (with original drafts of the OfficeBrawl design process) that was partly conveyed in the facilitation of the course and partly was figured out during making. It was essential that paper prototyping has been used to fine-tune the structure of the dialogue, before its implementation in Scenejo. The intermediate results have been sketches, graph structures, notepad or card games for balancing simple arithmetics, and excel sheets with dialogues. A selection of these materials are in the appendices.

The diagram in Fig 15 implies that iterative work is crucial, including the authoring as implementation The Scenejo default graphics have been used to playtest the authoring results, using the text-to-speech facility. Besides that, a text-only version is also available for playtesting. Maintaining the drafts during implementation was also found essential, as they partly gave a better overview on the structure of the dialogue than the authoring tool could provide yet.

Ideally, the production of the video snippets is the last step, after the game has reached a state in which no changes to the dialogue are expected any more. In our project however, due to the semester schedule, the production had to begin before the implementation was completed. In
fact, the conceived sentences were complete and could not be changed anymore, only their conditions for occurrence in the implementation.

The dialogues, which had been at first conceived in German, were translated to English (by help of Georg Struck) and transformed into scripts. The recording of 373 audio files (each containing one turn of one character) lasted one overly long day in the studio. For half of these, videos have been rendered out of Crazytalk Animator (taking about 2 weeks by 2 persons). The somewhat wiggly animations of face photographs gave the result a surprisingly acceptable aesthetics, which later turned out to work very well with the video client. The material produced did not cover the whole game, only the beginning scenes, 4 possible endings and one big conversational thread in between (out of four planned). With parts of the material, the students produced a fake video demonstration, which shows the concept online on Youtube.

### 3.2.2 Evaluation Remarks

From the point of view of the facilitators of this course, it was a successful project. The students were extremely ambitious and seemed to have fun, although it was their first interactive storytelling or game project. The IRIS educational material and concepts could be evaluated at the same time.

The general concepts of dialogue-based interactive story creation were conveyed by the material previously created for tutorials and workshops (Spierling, 2011). This material was quickly understood by the students, judged by their resulting drafts of concepts and questions asked. It was felt as a success to not present the theoretical topics all at once, but to let them explore practical assignments first (research, concepts) and add more material step-by-step. At times it happened that at the weekly meetings, the students presented their work but arrived at a critical point, for example, being overwhelmed by complexity. It was mostly possible to address these concerns with new assignments breaking down the tasks to solve, presenting the whole method in pieces. Especially the theory on speech acts and dialogue structures became interesting only late in the process, but was then well taken up.

In the beginning it was difficult to find ideas of a general story topic and the goal of the player. Many brainstorming sessions were used to come up with a satisfying idea that also fits the constraints of the Scenejo system. Obviously, the resulting story then showed conceptual similarities with the “Killer Phrase Game” (Spierling, 2008); at least the user role is quite similar.
During the dialogue design phases, indeed several iterations of interactive paper prototyping and role playing have been done for game testing, before anything was authored in the authoring tool. The students came up with the idea to use Youtube as a hyper-video platform for prototyping, clicking through a structure of filmed roleplay pieces of their dialogue draft.

The system Scenejo was well perceived and provided no problem in the first steps, when using the tutorial. However, when it came to finally implement the more complex structure, only one student dared to take over the authoring task who was learning very quickly, leaving the others behind. This point was risky, as it would have been preferred by the facilitators to assign the technical authoring to at least two persons, who would do pair programming and communicate about the concept at the same time. The isolated work of the technical author had led to a situation in which – while the game mechanics were clear and correctly implemented – the others lost contact to the iterative authoring process. Thus, they were not aware anymore of some details and modifications the student performed, and design drafts did not reflect anymore completely the code produced. After the project, this made it also difficult to modify and debug the final outcome for further improvements. Two students later reported that they were in fact afraid of touching the Scenejo authoring tool, and were therefore happily engaging themselves in other time-consuming tasks to solve, such as the animation.

The technical authoring of the conceived dialogue in SAT (Scenejo Authoring Tool) showed after a while the limitations of this novel authoring tool, as nobody before had created or tested a dialogue of that complexity. After the XML project file could not be loaded anymore by the tool (or took too long), the technical author started getting into editing the XML directly (although he did not have a programming education), and was able to finish it successfully. Meanwhile, the problems with the tool were also fixed. As a side effect, it could be constantly improved because of the extensive user testing. It became obvious that the tool was good for getting started with something basic, but many more requirements were coming up as a bigger storyworld already existed and authoring would also include teamwork.

3.2.3 Conclusion

The final prototype “Office Brawl” was presented at the ACE 2011 conference in Lisbon at a demo session and was well accepted. As assumed, the players liked the video representation more than the default 3d visualisation of Scenejo and found it to be more emotional and fun. Some even did not care about still existing flaws in the game mechanics, because they liked the look and feel in general.

Concluding on the creation process, it can be said that the concepts were understood and successfully employed by media students. It showed that the educational material and the tutorial approach worked. As the students were ambitious and keen to learn new things – and they did not have a strong background in any potentially conflicting concepts (?) – the process was almost straight-forward. Still, issues became visible in the cooperation of the roles of conceptual and technical authors, which in that case did not break the result. The end product is a finally playable prototype – however, for perfection, it needs improvement of the dialogues and the conversation structure. In the end, the proposed iteration in Fig. 15 has not been performed often enough before finishing, and a testing phase was also missing.

3.3 “Harold in Trouble”

The evaluative remarks in this report are pointed out from the perspective of the technical author in the team process, Steve Hoffmann, who also had a share in the conceptual design.

3.3.1 Design Steps

1. Creation of the educational material and the card game:
   1.1. Presentation of AI-based planning to author Georg Struck and multiple iterations of improving the material based on author’s until he got good insight into the concepts
1.2. Brainstorming of genre that could benefit from key aspect of planning - result: comedy and slap stick like chain reactions followed by brainstorming of story details (characters, possible actions, …)

1.3. Listing and abstraction of all possible actions within the selected scene (exploring the principle of abstraction) and filtering of interesting and funny chains by alternating them

1.4. Creation of a net of connections between actions and finding of useful preconditions and effects to make the story work (by the technical author)

1.5. Creation of the card game, test playing and fine tuning

2. Exploring debugging by using Linear Logic:

2.1. Transformation of the STRIPS-like planning representation of story into Linear Logic (developing of a simple process to visualize this)

2.2. Testing the story with the proofing tool of the University of La Rochelle

2.3. Multiple iterations of:
   - Requesting additional information from the tool
   - Implementation of the new functionality by the tool developer
   - Testing and evaluating the outcome

2.4. Improving the card game to overcome found flaws

3.3.2 Evaluation Remarks

- The brainstorming phase of story details (characters, possible actions …) between the creative and the technical author worked well. We quickly got a lot of ideas of what could happen in the story. But we also quickly reached a point where it became visible that we could not realize the whole range of possibilities because the creative author wrote based on the brainstorming: a whole act of a longer story that was still too extensive and complex for our purposes. So we decided to choose a certain scene that would fit our requirements best.

- Very helpful to find alternative actions in the listing and abstraction process was to use a table with different abstraction levels and write down the actions in higher or lower level columns. After that we could think about higher abstraction levels to group some actions or also go back from higher levels and think about additional concrete actions. This process went well and we got quickly even more possibilities and also an abstract layer that allowed modelling in an easier way.

- Because only one attribute was chosen as the main value that could influence the course of the story, finding the preconditions and effects was a relatively easy task. The actions and situations were already known and so these values could often directly be derived.

This overall process was quite easy in the beginning, but got more difficult the more content was integrated. Working mostly with tables and pieces of paper (similar to the final cards) that were laid out, it was hard to keep an overview. The final game with 40 actions started to reach an overall limit for doing this process just “by hand”.

- Issues in the second part of the case study appeared as the tool developer questioned the need for certain statistics. For example, the conceptual author asked for the number of the longest and shortest possible story outcome with the motivation to find unwanted shortcuts in the story and get an overall impression of the possible duration of the story. This information was not judged as useful by the developer and had to be defended and explained in detail before it was finally implemented.
3.3.3 Conclusion on the Case Study

- Concluding the first part of the case study (creation of the general story and the card game), it can be said that understanding the principles of planning is a relatively easy task compared to using them with a growing amount of content.

  Automatic and semiautomatic tools could be a huge help in this process. This became obvious as we implemented the card game story into the EmoEmma Authoring Tool were it was much easier to test the outcome of the story. Nonetheless the paper prototyping was crucial to reach a point in which an implementation was even possible.

- Concluding the second part it was quickly obvious that the tool could derive a lot more statistical information from the content than it already did and so we thought from the perspective of an author which facts could be interesting and help to identify possible flaws.

  This process worked well, only a few issues appeared as the tool developer questioned the need for certain statistics the creative author requested. Interdisciplinary work often faces such situations and especially in IDS it is important to be aware of them and to communicate a lot between the creative and technical side to judge if the outcome in a satisfying relation to the amount of work a certain new features needs.

3.4 Summerschool Workshop Case Studies

This section gives brief assessments of lessons learnt from the practical workshops at the summer school, in which case studies of creation have been performed. The assessments are mostly made from the points of view of the session facilitators.

3.4.1 “All about Peter” (Scenejo / Conversation Modelling)

The remarks made here are mostly reflecting the viewpoint of the Scenejo workshop’s facilitator, Ulrike Spierling, also reporting on some participants’ expressed points of view.

3.4.1.1 Design Steps and Workshop Method

The group of participants in this workshop consisted of a literary writer, an educational designer (e-learning professional) and two young computer scientists as starting researchers in Interactive Storytelling. The steps performed were:

- Introduction to Scenejo with a quick demo of the tool and principles.
- Participants requested to rather start conceiving without the tool and do hands-on tutorials later.
- A significant amount of time was taken by brainstorming about the scope of the potential story, the reasons to have conversations, and mostly, the reason to have conversations with people we don’t know.
- An assignment was to start scripting linear dialogues and try to abstract them into speech acts; think of what these do to the storyworld and the story idea. This caused iterating on the story’s motivation again.
- Finally hands-on authoring was explored with the Scenejo SAT tool, to explain the conditions for letting utterances influence a certain world state (attribute).
- The day before presentation the group split up into two parts, one preparing the conceptual presentation and powerpoints, the other finishing a playable dialogue with the SAT tool. This could be demonstrated live at the final presentation.
3.4.1.2 Evaluation Remarks

- The group started great in discussing concepts of conversational storytelling, and coming up with the initial idea to want to know “all about Peter”. From then on, the discussion was more difficult as it circled around the goals of the player and the goals of the story.

- The group had an (interesting) argument about the question why we need a goal in interactive storytelling. Interestingly, doubts (and resistance) were expressed by the literary writer that a goal is necessary, as he wanted to have just a free gossip conversation at a party, which should be fun. Other members of the group argued that the goal of a story (and the characters) has to be clear. That discussion took some time of the workshop. Another fundamental, philosophical and controversial discussion was about the question whether the restrictive nature and constraints of the available tools would be a curse or a blessing for creativity.

- After explanation of dialogue abstraction with an assignment, an almost surprising big step was done as homework by the educational designer, having exactly adopted the concept. However, it was remarked that the thinking in speech as actions was an unusual concept and it was more tempting to just completely script the dialogues. Still, from then on, the modelling of the story could also be distributed within the team, letting everybody come up with ideas for dialogue.

- The test implementation of first dialogue threads in Scenejo was done very quickly by the participating computer scientists, it was also done with great enthusiasm by the educational designer, but it was avoided by the literary writer, who preferred to stick to the conception only. The tool was perceived as being too restrictive by the author, which would have prevented any ideas for him. So we added a brainstorming to the final conception, in which we were not trying to match Scenejo constraints, but would need further technology development to realise it.

3.4.1.3 Conclusion on the Case Study

The resulting story outline is rather simple and would need lots of more conceptual work before a full implementation would make sense. However, the workshop also tried to convey basics of conversational and technical constraints for take away, and it was felt as a success that a live demo could be played nonetheless at the end. Further, the facilitator of the workshop persistently refused to do the authoring work herself, but moderated and helped the participants do the conception and authoring (which was partly experienced differently in other workshops). It was felt that the discussed points during the conception were crucial and important issues for Interactive Storytelling. The Scenejo system was perceived differently by different participants; for some it was suitable to convey the basics of conversation modelling by playing around with it; for one (who did not play with it) it was too constrained.

3.4.2 “Diver's Luck” (EmoEmma / Planning)

The main remarks in this assessment reflect the point of view of the facilitator of the workshop, David Pizzi.

3.4.2.1 Design Steps and Workshop Method

1. Discussion of main outlines/ideas of the scenario (proposed by one participant)
2. Presentation of the tool, questions and answers regarding tool and technology
3. Creation and formalisation of the story (work in sub-groups and collaboration via whiteboard and paper sheets; later alternating between formalisation and generation in to incrementally create planning domain and to evaluate story-world)
4. Creation of planning domain:
Formalisation within actual tool was made by the workshop organiser (in parallel to the creation/refinement and formalisation, the tool itself was also enhanced to allow a text and image visualisation, see Fig. 5)

5. Creation of representation:
   Dividing groups between people writing text for operators and those finding images

3.4.2.2 Evaluation Remarks

- One success was to still be able to implement a small story-world, generating around 5/6 variants within the few hours of workshops we had. This shows that the process might be quick to undertake, especially with trained writers. However, the tool provider had to do the knowledge engineering as the choosing of the proper terminology might have had discussions and makes lose more time.

- The main difficulties came from the fact that some participants were rather trying to question/argue the technical aspect/representation of the tool. In other words, they were trying to discuss the use of planning representation in the process of story formalisation. This had to be stopped at some point as that was not the point of the workshop... Strangely, those questions were coming from the more technical participants when we could have thought it would have rather been the non technical people who would be trying to understand how things worked. A question we might ask is would have this happened if the workshops happened with more participants that were pure writers/authors.

3.4.3 “Plain Terror” (SceneMaker / Finite States)

These remarks are pointed out from the point of view of the facilitators of the summer school workshop, Steve Hoffmann and Gregor Mehlmann.

3.4.3.1 Design Steps and Workshop Method

1. Introduction of the SceneMaker system (demo and example of the authoring process)
2. Initial brainstorming for basic story elements based on technical and timely constraints (closed room scenario, limited time, narrator tells story, 2-3 characters) and from personal tastes (live threat, conspiracy)
3. Brainstorming and refinement of the user role, setting, story, characters
4. In multiple iterations:
   - Character creation
   - Finding meaningful values
   - Finding dialogue ideas
   - Finding keywords for dialogues
5. Creation of abstract story structure (formalisation of previous ideas on whiteboard)
6. Implementation of story structure into SceneMaker (by system provider), in parallel in groups: dialogue writing, image creation

3.4.3.2 Evaluation Remarks

- Getting the basic story elements was simple, but the following was a long and ‘painful’ process: finding the actual setting, the characters, the story itself and most importantly answering the question what the user should do. The group got lost in possibilities and had trouble to focus on one thing or the other. We discussed a lot about the setting and characters, hoping to find a crucial idea of what the user could do in this setting with the
task in mind that we wanted to create a dialogue-based story, but couldn’t succeed; ‘endless’ brainstorming sessions were the result.

Even after having heard Georg Struck’s lectures about “Character Creation” and “Natural Language Input for Games - Lessons Learned” we were not aware of the issues and on what we had to focus. We needed some direct advice from him, to get back on track and find a crucial role.

‘Pushing the buttons’ was an important phrase for us and after having realized and further worked on that, we found a scenario in which our initially brainstormed story elements fit together with an interesting player role and a setting we found generally satisfying.

- The formalization and abstraction of the story was in comparison to the previous steps easier. Most participants were quite good in thinking in abstract ‘blocks’ and ‘conditions’. This process worked well on the abstract level of our not very complex story. Participants with experience in game design and roleplaying found it relatively easy to formalize, but one participant without that background pointed out for example that “it is hard to formalize ideas into state machines”. More time for exercises regarding that topic would have been useful.

- However, because of the time constraints and the strong will to have a presentable and running demo in the end, the final implementation of the general story structure and some dialogues were mostly done by the tool provider and not by the participants. Therefore it cannot be said if the participants would have been able to proceed with the formalisation process and get into the details of the SceneMaker system.

From a personal point of view we have a strong believe that the participants with a more technical background would have easily succeeded with this task if we had one more day while the non-technical authors would have needed more time to learn how to use the tool what would not be possible within one or two additional days even after it was obvious that they understood the underlying concepts very well; much more examples and exercises would be required.

- In general the participants pointed out that they would have wished to have more time to work on their ideas and the implementation what was unfortunately not possible. One reason for that was that we used a lot of time in the beginning to find a satisfying story what is interestingly quite similar to experiences with “The Cruise” case study.

- A useful help was the participation of the system engineer who was able to modify the user interface in parallel to the workshop and also integrate some participants scribbles (from a comic artist) so that the end result could already give a good impression of the envisaged outcome.

3.4.3.3 Conclusion on the Case Study

- The difficulties in finding a crucial player role in a satisfying setting shows that is not alone a difficult task itself, but also that only getting lectures and hearing the theory does not always help. Authors also have to be aware of the right situations in which they have to actually use this knowledge.

That is something that surely is a question of experience and a lot of hands-on work which is hard to be found in such a new medium. One possible conclusion to this could be that lectures and workshop should be even more aligned to each other and be structured in shorter alternating parts.

- Concluding the whole experience it was visible that such a six day workshop accompanied with theoretical lectures is sufficient to teach creative authors the basics of interactive story creation with state machines. But to get to a higher level and create something more complex than a short demo and to get the authors into the details of the system much more time and more educational material covering also these details is needed.
3.4.4 “The Trick” (IDtension / Goals, Tasks, Obstacles)

This assessment is given from the point of view of the facilitator of the summer school workshop using IDtension, Nicolas Szilas.

3.4.4.1 Design Steps and Workshop Method

1. Story initial design: Each participant, individually and independently from the specific narrative engine used during the workshop, thought of their own story and presented it during a plenary session. This happened before the start of the workshop itself.

2. General introduction into IDtension: It was a rather short and informal presentation of system, as we expected that the effective learning of the engine would occur during the next phase. All participants played with The Mutiny, the demo story of IDtension. A short discussion about their user experience followed. Then the development environment was introduced, in particular the way to modify key authoring files.

3. Hands-on IDtension Tutorial: The tutorial7 is made of a series of successive interactive stories, which introduce progressively the concepts used in IDtension. Participants could see and modify the authoring data related to these stories, and observe the consequence on the user experience. The whole process was guided by the system developer (Nicolas Szilas) who proposed some small exercises to be completed during the learning session.

4. Story concept development: From the stories imagined in the first step, a “merged” story was created by the participants. Data were iteratively gathered regarding the characters, their motivations (goals), various events that could happen, etc. These data were progressively grouped into related IDtension categories, in an informal manner. At the end, a document was written grouping the characters’ description, backstories, and main storyline events.

5. Translation of Story concept into IDtension model: “goal-task structures” for the story were created. This was achieved collaboratively, with various post-its used on a paper board. Different types, colours and orientation of post-its mean different structural elements. The system developer guided this phase to filter unfeasible elements.

6. Implementation of content material: The authors (grouped around two computers) and the system developer implemented the story collaboratively, thanks to a versioning system. Some authors would write the structures (more demanding from a computing point of view), other would write the text expressions and the introduction. The co-animator of the workshop (Paolo Petta) provided necessary assistance at this stage. The story was tested continuously.

3.4.4.2 Evaluation Remarks

- The learning phase (steps 2 and 3) was successful, in the sense that the learning experience was positive and the participants showed confidence when handling IDtension's concepts. As illustrated below, this is not a guarantee that the authors will be at ease with these elements when implementing a story, but at least, they grasped the main concepts and were not afraid of them.

- The story concept development took some time, since we finally incorporated ideas from the several stories imagined in step 1. We had the feeling that part of the difficulties in this phase were common to any collective creation process. The result is a story that appears (on paper) rich and exciting.

7 http://tecfa.unige.ch/~szilas/IDtension/tutorial
• Regularly, the system developer intervened to moderate the too ambitious propositions that were discussed. Nevertheless, he avoided to systematically cut any proposition apparently not compatible with IDtension. Interventions remained scarce, to foster the creativity of participants. The line between letting the participants dive into unrealistic propositions and systematically constraining them on valid formal elements appears difficult to find.

• Some of the authors’ propositions were inspiring for improvements of the engine. For example, the idea that the player's character could be switched during the story (from the boy to the mouse for example) was proposed. This idea is not very complex to implement in IDtension.

• Another type of system developer intervention consisted in insisting in the user's action. Authors tended to describe wonderful narrative situations and resolutions, but omitted to think in term of user's actions. We regularly asked the question: what is the game at this moment? There was a phase of hesitation regarding the role of the main user (as the boy or as the mouse?). This confusion made the focus on the player's games more difficult.

• The translation into the goal-task-obstacle formalism was much more difficult. At this level, it seems that a great expertise in IDtension is necessary. Despite their understanding of the IDtension concepts (see above), participants would not envision all the consequences of their design choices. The system developer played an important role during this phase.

• Implementation was difficult for authors. This is due both to the format of scenario files (e.g. XML) and the inherent complexity of the formalism. For example, it was uneasy for one author to understand why a goal had to be both declared in a generic manner and then declared “again” as an initial condition. Some additional difficulties were added because of French tags and examples.

3.4.4.3 Conclusion on the Case Study

• Although IDtension is one of the most complex, generative and interactive IS system, not previously trained authors are able write a valuable story on it within a few days, provided that the system developer is participating.

• This was only possible with a high level of workshop preparation, in terms of learning material (the above mentioned tutorial).

• The critical phase was neither the story design nor the implementation but the translation between proto-formal description of the story (with an incomplete and non formal list of goals, tasks, characters, features, etc.) to an effective formal model ready to be implemented. We feel that a layer of description is missing at this level, because although IDtension's elements (goals, obstacles, values, etc.) are familiar for authors, the way they behave computationally is complex to grasp and they can be put together in many different configurations.

• We were satisfied to observe that the four authors self-organized into two groups, one for the structure, the other for the texts. One author from the former group had an expertise in computing, and this appeared crucial for the final success. We believe that the existence of such profiles (both computing and writing) is still essential in Interactive Storytelling design. However, we did not make this kind of distinction beforehand, as it is made for example in a game development team. This enabled the four authors to collaborate in a smoother way. Furthermore, the more technical author was as involved in the story as the other authors.
3.5 General Assessment of the Community Events

This section gives a more general report and assessment of mainly the Wiesbaden summerschool as a community event, and a tutorial given at ACE 2011 in Lisbon.

3.5.1 IRIS Summerschool on Interactive Story Creation 2011

The IRIS Summerschool on Interactive Story Creation took place from the 19th to the 24th of August 2011 at the Hochschule RheinMain - University of Applied Sciences in Wiesbaden, Germany. It was organised by HSRM (Steve Hoffmann, Ulrike Spierling) and supported by IRIS partners UOA, OFAI, TEES and UNIGE, who sent lecturers and facilitators for the workshops with IRIS tools (Gregor Mehlmann, Paolo Petta, David Pizzi, Stefan Rank, Nicolas Szilas).

It was targeted at students, colleagues, professionals and researchers with an intermediate and advanced level of creative experience in any storytelling discipline (such as film, video games, RPG etc.) or in interactive story creation. Participants were supposed to able to experience ways to structure story ideas so that interactions within the storyworld are enabled and would lead to sensemaking responses. It also provided help to better analyse interactive story ideas.

Fig. 16 and Fig. 17 show the employment and professions of the actual 19 IRIS-external Summerschool participants. The larger parts had academic employments or were freelancers in their field of work (Fig. 16). The professions (Fig. 17) show that the majority were professionals in some creative area (green: media or game designers, or writers).
Additionally to the external participants, the Summerschool was attended by six student volunteers (of HSRM media management) who attended the lectures part-time and helped with the organisation of workshops and video recording (of all lectures and partly workshops) for the rest of the time.

18 of the participants filled a questionnaire that gave us more information about their background and how they perceived the summerschool. Fig. 18 shows different aspects of previous experiences the participants had, revealing that most had a medium to high level of experience in interactive story creation. Programming experience was roughly 50/50; nearly half of the participants were experienced, but the other half only low to none. The experience with story engines in general was nearly equally distributed.

![Fig. 18. Different experience aspects of Summerschool participants](image)

The Summerschool was structured in lectures and workshops. The lectures should convey not only theoretical knowledge but also practical experiences of researchers and authors in the field of Interactive Digital Storytelling (IDS). The main topics were the modelling of:

- Characters
- Interactive dialogue and language
- Plots and plans
- Story structures

The focus hereby was to use and test found principles and the created educational material to achieve increased interactivity, variability and flexibility of stories.

We also invited 3 of the participants to give a talk from their professional perspective (Georg Struck, Florian Berger, Tim Partlett). The lecture titles (the full schedule can be found in appendix B.1) were the following:
Ulrike Spierling: “Introduction to Interactive Story Creation”
Georg Struck: “Character Creation”
Paolo Petta and Stefan Rank: “Character Assembly”
Ulrike Spierling: “Dialogue Modelling”
Georg Struck: “Natural Language Input for Games - Lessons Learned”
Gregor Mehlmann: “Visual Authoring of Interactive Virtual Characters”
Paolo Petta and Stefan Rank: “Behaviour Control”
Steve Hoffmann: “Shuffling Cards - Simple Story Modelling for Planning”
David Pizzi: “Advanced Planning and Interactive Storytelling”
Nicolas Szilas: “Narrative Models for Interactive Digital Storytelling, their roles, their limits.”
Florian Berger: “Pen&Paper Role-playing as a Model for Interactive Storytelling”
Tim Partlett: “Narrative Designer at Crytek”

The gained knowledge could partially directly applied during the workshops of interactive story creation. The project-based exercises showed how to turn a story into a dynamic model to run with various story engines. Four different workshops were offered, each associated with one IRIS system and supported by the participating IRIS project members:

- Modelling a storyworld based on planning (EmoEmma)
- Modelling a storyworld based on goals, tasks and obstacles (IDtension)
- Modelling a storyworld based on finite states (SceneMaker)
- Modelling a conversational storyworld (Scenejo)

Before the summerschool, registered participants were asked to give us ranked preferences for participating in a specific workshop. We could manage to assign everybody to at least his/her second preference, by also trying to group together participants with different backgrounds (technical background vs. design background) in a fair way. Participants were also asked to think about an interactive story idea that they pitched on the first day.

The event started off with an introduction of all participants and some warming-up games like mini improvisations. Participants were also encouraged to propose short ad-hoc presentations of their work, which was taken up by some. The atmosphere was very communicative, enthusiastic and intensive, and discussions often were further adjourned into the evenings.

For exchanging lecture material and ideas, we set up a Moodle e-learning course. For the workshops, we setup a shared Dropbox folder to distribute files more easily. Each workshop room was equipped with a PC and a beamer; mostly participants used their own computers. The Moodle website also offered forums for discussions. In spite of many encouragements, they were only used sparsely. The plenary discussion forum had seven relevant topics; only one workshop used its separate forum. We assume simply that people preferred real-life discussions, which filled the days already to a high degree in the intensive groupwork.

Table 2 shows a summary of the quantitative part of the filled questionnaires. A merged summary of qualitative statements can be found in appendix B.3. The table below shows the number of people who ticked a box tending towards a certain statement (left or right) using a five-point Likert scale. The column “Av.” gives the average answer (from 1 to 5) for this question. “n/a” was also an option to tick if nothing applied.

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8 http://moodle.org/
9 http://www.dropbox.com/
<table>
<thead>
<tr>
<th>Statement</th>
<th>Av.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>n/a</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before, I had much experience in creating interactive story content.</td>
<td>3.17</td>
<td>5</td>
<td>8</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td>I have never created any interactive story content before.</td>
</tr>
<tr>
<td>I am an experienced programmer.</td>
<td>2.47</td>
<td>8</td>
<td>1</td>
<td>1</td>
<td>6</td>
<td>1</td>
<td>1</td>
<td>I have never programmed anything in my life.</td>
</tr>
<tr>
<td>I am experienced in using or conceptualising with story engines.</td>
<td>3.00</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>I have never used or heard of story engines before.</td>
</tr>
<tr>
<td>The presented lectures were very interesting (see below for more differences).</td>
<td>1.59</td>
<td>10</td>
<td>4</td>
<td>3</td>
<td></td>
<td>1</td>
<td></td>
<td>I was not interested in the majority of presented topics of lectures.</td>
</tr>
<tr>
<td>The presented topics were too complex for me.</td>
<td>3.12</td>
<td>3</td>
<td>10</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td>The presented topics were too simple for me.</td>
</tr>
<tr>
<td>The motivation for using generative engines has become clear to me.</td>
<td>1.88</td>
<td>8</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td></td>
<td>1</td>
<td>I do not see any reason for using generative engines in IS.</td>
</tr>
<tr>
<td>I totally understand and agree with the presented creative principles.</td>
<td>2.28</td>
<td>3</td>
<td>8</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td>I do not agree with the presented creative principles.</td>
</tr>
<tr>
<td>Story abstraction is a concept that future authors should be familiar with.</td>
<td>1.39</td>
<td>11</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Story abstraction is nothing for authors but for engineers.</td>
</tr>
<tr>
<td>Defining conditions and variables is necessary for creative authoring.</td>
<td>1.89</td>
<td>8</td>
<td>5</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td>Defining conditions and variables is to be left for engineers.</td>
</tr>
<tr>
<td>Formal story modelling is a cumbersome concept for me.</td>
<td>3.76</td>
<td>2</td>
<td>4</td>
<td>7</td>
<td>4</td>
<td>1</td>
<td></td>
<td>Forma story modelling is straight-forward for me.</td>
</tr>
<tr>
<td>Understanding virtual / intelligent agents is important for creators in IS.</td>
<td>2.56</td>
<td>4</td>
<td>4</td>
<td>7</td>
<td>2</td>
<td>1</td>
<td></td>
<td>Understanding virtual / intelligent agents is unnecessary for creators.</td>
</tr>
<tr>
<td>Understanding planning methods is important for creators in IS.</td>
<td>2.00</td>
<td>4</td>
<td>10</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td></td>
<td>Understanding planning methods is unnecessary for creators in IS.</td>
</tr>
<tr>
<td>I have learned many new things.</td>
<td>1.72</td>
<td>9</td>
<td>6</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>I have not learned anything new.</td>
</tr>
<tr>
<td>The balance of theory and practice was perfect.</td>
<td>2.35</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>5</td>
<td></td>
<td>1</td>
<td>The summerschool was too theoretical.</td>
</tr>
<tr>
<td>The balance of theory and practice was perfect.</td>
<td>1.86</td>
<td>5</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td></td>
<td>The summerschool was too practical.</td>
</tr>
<tr>
<td>I liked the structuring of the week and way of presenting the topics.</td>
<td>1.78</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>I did not like the structure and way of presenting the topics.</td>
</tr>
<tr>
<td>The number of participants was too high.</td>
<td>3.18</td>
<td>9</td>
<td>4</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td>The number of participants should be higher.</td>
</tr>
<tr>
<td>The summerschool time was too short for the presented material.</td>
<td>2.56</td>
<td>2</td>
<td>5</td>
<td>10</td>
<td>1</td>
<td></td>
<td></td>
<td>The summerschool time was too long for the presented material.</td>
</tr>
<tr>
<td>I would recommend such a workshop/ tutorial for future authors in IS.</td>
<td>1.17</td>
<td>15</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Such a workshop/tutorial is useless for future authors in IS.</td>
</tr>
</tbody>
</table>

Table 2. Summerschool questionnaire, summary of results.
Fig. 19 shows that more than half (59%) of all participants found the complexity of the presented topics well balanced, while the rest was divided in people who found it (too) simple (24%) or complex (17%).

From the point of view of the organisers, this summerschool was the most successful community event in authoring that was conducted during IRIS, in terms of felt effectiveness. The time was long enough to have detailed discussions and also allow for some typical meanderings that creative processes obviously must have. We cannot expect to deliver a tutorial of theoretical knowledge (or principles), after which people are directly able to employ this knowledge in a practical process. This has been experienced more than once during the lifetime of the project.

However, this approach also involves lots of work and effort (also budget-wise). Not only speaking of the organisers, also the participants invested time and costs. This is also reflected by a great number of potential participants who communicated through email that they would have loved to participate, but could not get the time off their work, or had scheduled vacations during summertime. Only in the last 2 days before the start, we had to accept 2 registered participants to withdraw their attendance in the last minute, and one “no-show” – all from freelancers or employees in the media business. Although the target group was not specifically researchers in our own community, we attracted these to a great extent. By conversations with the participants, we also found that if somebody showed up from the “writing” or “story creation” profession, to a certain extent they understood themselves as researchers in their professional domain, because they want to explore new directions that they have not gone so far. The actual participants of the summer school were a blend of interesting people with rather individual profiles.

Rethinking our target groups for future authors of interactive storytelling, we concluded that there is not an existing field of media artist (such as for example, either computer game designers or TV writers) that we would assume to be “the” target group. Including all our exercises mentioned in this report, we experienced that the most promising and fast achievements have been made by people who either have no strong background yet, so that they are keen to learn, or by people who rather have the background of individual role playing than that of a writer. However, we also have to acknowledge that these made experiences are still eventually depending on arbitrary circumstances. The results were nevertheless encouraging to continue with similar efforts in the future.

3.5.2 Tutorial at ACE 2011

Towards the end of the project, we conducted another tutorial at ACE 2011, on 8th November 2011, titled “Introduction to Interactive Story Creation with Generative Tools and Systems”. The presenters were Ulrike Spierling, Nicolas Szilas and Steve Hoffmann. In principle, it covered the same range of topics as the tutorial given at ICIDS 2010 in Edinburgh, with improved material. The tutorial was attended by only 7 participants, which was a bit disappointing. However, the personal feedback by the participants was quite good. They pointed out (again) the importance
and potential of educational material such as the card game for teaching planning principles, which was developed in 2010 for the ICIDS tutorial and presented as a paper at GET 2011 (Hoffmann et al., 2011). The story “Harold in Trouble” is of a suitable size and structure to make the principles very clear. This can be presented as the card game, but also within the authoring tool EmoEmma and Linear Logic graphs. Showing only the latter (or the latter with a different content) has been experienced to be less well understood, whereas using that same story from the simple exercise through to the complex makes ends meet.

For evaluation, 5 filled questionnaires were returned, which can be found in the appendices. Table 3 shows the number of people who ticked a box tending towards a certain statement (left or right) using a five-point Likert scale. The column “Av.” gives the average answer (from 1 to 5) for this question. “n/a” was also an option to tick if nothing applied.

Concluding the whole process, in IRIS we developed principles that now can be taught in lecture form or by practical exercises. During their development, it has been essential to have tools to use, even if these tools have not been fully usable, or if these tools only cover certain selected aspects of Interactive Storytelling. The first IRIS “Workshop on Authoring Methods and Conception in Interactive Storytelling” at ICIDS 2009 in Guimarães (Spierling et al., 2009) explored the first hands-on experiences with IDS systems getting feedback from authors willing to use them. A next step in creating educational material for IDS and testing the found principles was the tutorial “Introduction to Interactive Story Creation” 6) (Spierling et al., 2010) at ICIDS 2010 in Edinburgh, which was followed by the workshop “Education in Interactive Storytelling” to discuss the provided material and improve the collaboration between researchers and lecturers in the field of IDS. The results of these three events were used as a base and to improve the previously described Summerschool 2011 and the following tutorial at ACE 2011.
<table>
<thead>
<tr>
<th>Statement</th>
<th>Av.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>n/a</th>
<th>Statement</th>
</tr>
</thead>
<tbody>
<tr>
<td>I have much experience in creating interactive story content.</td>
<td>4.40</td>
<td>1</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>I have never created any interactive story content.</td>
</tr>
<tr>
<td>I am an experienced programmer.</td>
<td>1.80</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>I have never programmed anything in my life.</td>
</tr>
<tr>
<td>I am experienced in using or programming story engines.</td>
<td>4.20</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td>0</td>
<td>I have never used or seen a story engine before.</td>
</tr>
<tr>
<td>The presented topics are very interesting.</td>
<td>1.00</td>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>I am not interested in the presented topics.</td>
</tr>
<tr>
<td>The presented topics are highly relevant for my work.</td>
<td>2.40</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>The presented topics are irrelevant for my work.</td>
</tr>
<tr>
<td>The presented topics are too complex for me.</td>
<td>3.20</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>The presented topics are too simple for me.</td>
</tr>
<tr>
<td>The motivation for using generative engines has become clear to me.</td>
<td>1.80</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>I do not see any reason for using generative engines in IS.</td>
</tr>
<tr>
<td>I totally understand and agree with the presented creative principles.</td>
<td>1.80</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>I do not agree with the presented creative principles.</td>
</tr>
<tr>
<td>Abstraction is a concept that future authors should be familiar with.</td>
<td>1.80</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Abstraction is nothing for authors but for engineers.</td>
</tr>
<tr>
<td>Formalising the conditions for actions is a cumbersome concept for me.</td>
<td>3.80</td>
<td></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td>0</td>
<td>Formalising the conditions for actions is straight-forward for me.</td>
</tr>
<tr>
<td>Formalising the conditions for actions is necessary for creative authoring.</td>
<td>2.00</td>
<td>1</td>
<td>3</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>Formalising the conditions for actions is to be left for engineers.</td>
</tr>
<tr>
<td>Understanding planning algorithms is important for creators in IS.</td>
<td>1.60</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Understanding planning algorithms is unnecessary for creators in IS.</td>
</tr>
<tr>
<td>I have learned many new things.</td>
<td>2.00</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td>0</td>
<td>I have not learned anything new.</td>
</tr>
<tr>
<td>The tutorial was too theoretical.</td>
<td>3.80</td>
<td>3</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>The balance of theory and shown examples was perfect.</td>
</tr>
<tr>
<td>I liked the explanations and way of presenting the topics.</td>
<td>1.80</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>I did not like the explanations and way of presenting the topics.</td>
</tr>
<tr>
<td>The tutorial time was too short for the presented material.</td>
<td>2.40</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td>0</td>
<td>The tutorial time was sufficient for the presented material.</td>
</tr>
<tr>
<td>I would recommend such a tutorial for future authors in IS.</td>
<td>1.60</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td>0</td>
<td>Such a tutorial is useless for future authors in IS.</td>
</tr>
<tr>
<td>I would like to attend a more detailed (and longer) event on the topic.</td>
<td>1.80</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>I would not attend a more detailed event on the topic.</td>
</tr>
<tr>
<td>The tutorial should be repeated at a future conference.</td>
<td>1.60</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td>0</td>
<td>The tutorial should not be repeated.</td>
</tr>
</tbody>
</table>

Table 3. Overview of ACE 2011 tutorial questionnaires results.
4 The Role of Authoring Tools in the Design Process

The case studies and workshops performed in the last IRIS year were of different scope and length, included different tools and people, and led to different results. However, in the first place, we do not relate the differences in the results to the choice of the used authoring tools. All case studies would not have been possible without authoring tools – however, we were more interested in grasping the general approaches behind the tools than in the tools’ performance and usability aspects.

Practice also showed that it would be too early now to express strict guidelines for the design of authoring tools. The tools available so far – although they enabled the process at all – are too far from being assessed in terms of the exact usability of interfaces and similar ideas. They mostly lack more fundamental features that can be described at a more general level.

4.1 Tool Analysis and Development

During the project a lot of systems and authoring tools were explored. The most intensive studies were undertaken with the Scenejo and the SceneMaker system giving us a good impression of their pros and cons.

For Scenejo, a novel authoring tool named SAT (Scenejo Authoring Tool) was developed running independently from the more complex Scenejo system. The current version of SAT mainly provides a menu-based user interface that allows authors to enter content. However, entering content without having to programme is only the first issue to solve in authoring. Previous experiences, the work in the “Office Brawl” case study and the exercises in SceneMaker showed that content soon reaches states of complexity that are hard to manage without a good tool. This has led us to formulate a list of rough recommendations which are explained in the following.

4.1.1 Recommendations

The following recommendations are based on the experiences with different authoring tools used within studies during the IRIS project lifetime. In our design principles (Deliverable D 3.2), we also described a principle of treating debugging as part of an iterative authoring process. Most of the recommendations regard functionalities that would help teams of authors during such iterations. During technical authoring, content of IDS artefacts is quickly growing complex and it is hard to keep an overview without system assistance. We found that using the current Scenejo / SAT as well as SceneMaker, getting an overview within the hierarchical structure is getting cumbersome after a while. Both tools operate on a too small level of technical granularity. The recommendations are grouped in topics.

Abstraction/Hierarchies

Tools should offer authors the possibility to use abstraction or a hierarchical structure of the content. Because of the potential size of content and the differing degree of potential granularity, it is useful to structure parts on higher and lower levels, for example by grouping a high number of similar actions under an abstract action. For the intermediate design process authors can work with the abstract action to simplify the work and get back later to the concrete ones for working out the details.

It would also be an advantage if the system would offer the possibility to run the story even without content on the lowest level, giving the author an early impression of the end result without having to care of too many details that are not decided yet or too elaborate in the current design step.
Patterns
Because often structures reappear in the design process, authors should be assisted by the possibility to use patterns. While predefined patterns are already a huge help, authors would additionally benefit from the chance to create their own patterns. In the future it could be interesting to offer systems the ability to create pattern libraries and share them among authors.

Filtering/Searching
Authors would benefit from intelligent, configurable search and filter functions. The quickly growing size of the content makes it difficult to find specific elements that authors would like to modify. This gets even harder if the system offers the previously described concept of a hierarchical structure, requiring the author to know exactly in which substructure a certain element is nested. If authors could search over the whole content or pick just parts of the content for a search request, the exhaustive manual search we experienced with several prototypes would be reduced. This could also be supported by filter functions that would let authors pick the type of content they are looking for (dialogue, images, animations, parameter, conditions…).

Logging/Replay
Systems should offer a configurable logging mechanism that allows authors to backtrack the running of a story instance. It is important to find flaws and improve the story to tune the game mechanics. Therefore it is inevitable to see updates and overviews of parameter changes if a certain degree of complexity is reached. A connection between the runtime engine and the authoring tool would be an advantage because it would help to increase the speed of the test and debugging cycles.

This recommendation is related to the useful suggestion to jump to a certain point of the story based on the log, enabling to start over from an arbitrary point to test other options or changing parameters. With such a feature the often time consuming task of replaying unimportant parts of the story would be improved.

Permutation of Outcomes
To assist the debugging process, authors would greatly benefit from systems offering access to statistical data of all possible outcomes of a storyworld. If authors would be able to let the system permute the whole storyworld, if computational feasible, they would be able to improve the storyworld more easily. They could also select potential plot elements and get automatically retrieved information such as the average number of actions to get there or the number of dead ends.

Visualisation
Authoring tools should offer authors different kinds and perspectives of visualisations of the content. Depending on the current design step and goal of authors, they should be able to select an appropriate visualisation, only showing the currently important information and not overloading them with everything possible. For example it is possible that a tree like structure is not useful if authors are looking for a certain element and they would get a better overview by getting offered with a list view of that content type.

4.1.2 Summary
The previously described recommendations are partially wishful thinking and partially already realised or in the state of being explored. For example, we did explore the “permutation of outcomes” in the second part of the “Harold in Trouble” case study by using a tool to give us the described statistical information. The work on SAT reached a state at which we now have a framework that will assist the upcoming development and integration of different content visualisations and new search and filter functions.
5 Conclusions

The objective of the IRIS work package 3 “Authoring Tools and Creation Methods” has been to make Interactive Storytelling based on AI technology more accessible to story creators. During the lifetime of the project, two likewise necessary directions to solve this issue have been pointed out: a) by developing better accessible authoring concepts and tools, and b) by educating prospective authors in the conceptual principles behind AI-based IDS technology, hopefully without the need to teach too many technicalities.

IRIS has reached the objective of higher accessibility, by contributing to the state of the art

- a foundation of novel design principles, which have been proven to be applicable in several case studies,
- accessible educational material for introduction of concepts, evaluated at several workshops and tutorials,
- community events to disseminate partial results and discuss the suggestions within an authoring community, and
- a mostly public repository of case studies and knowledge resources in authoring, available online at iris.interactive-storytelling.de/.

The development of authoring tools was not the main focus of the project, however it was necessary at a small scale as a side effect of preparing practical exercises and case studies in authoring.

This deliverable reported on the case studies performed in the last year. They were building upon the previous work and were meant as a way of formative evaluation of the suggested design principles (see Deliverable 3.2). This can be concluded as follows.

Principles: “Abstraction” and “Conditional Events”

The need to abstract narrated sequences into some model, and to define story events as being conditioned by acting situations and their effects, came up in every conducted case study. We see these two basic principles as the core of story modelling. We found that those case studies experiencing difficulties with the two principles did not (or later than desired) include playable artefacts. We can state the hypothesis by our experiences that a strong experience in linear story writing techniques may hinder creators to buy into abstraction and conditional modelling, whereas experiences in the design or writing for role playing games lead to better take-up if the idea.

Principle: “Including the User from the Start”

It has been tempting in most of the case studies to start off by thinking of a story with characters and their goals, and to forget about the user or to postpone that issue. It was obvious from mostly all case studies, long or short, that following discussions about integrating the user's role were crucial and turning around again the story idea. Not only “The Cruise” and “OfficeBrawl”, also the summerschool reports show that a longer time than initially assumed was spent with getting this right from the start. The only exceptions were the cases targeting the planning approach, because it was possible to run the system without user interaction (not regarding authorial interaction of choosing alternative branches) and the user role was simply left out.

Principle: “Interaction Design as an Authoring Task”

We found that in order to verify that assumed principle with a case study, the story design would already need to be advanced to a certain detail. Interaction design has to do with the definition of affordances as well as direct feedback for/on user actions. This is especially important when the constraints of the interface are loosened, such as in natural language communication. In all our case studies, we were not able yet to let somebody play who was not involved in the design – except “OfficeBrawl”. The latter immediately showed that the required interaction design was
not done well yet and would need to be focused on in a redesign phase. In “The Cruise”, although it was not yet playable at all, we at least started to speculate about the affordances the system would offer, for example in form of the picture book, without testing its effectiveness. Nevertheless, we gained confidence that this principle is important as soon as we target really enjoyable interactive storytelling systems.

**Principle: “Externalising the Internal”**

This suggested principle could not be properly evaluated, because only few of our case studies reached a state at which playback and user interaction could lead to inner processes of the characters. “OfficeBrawl” was the only one to show it at a very abstract level, presenting the changing internal states of the characters as “temperature gauges” of their heated discussion. However, the rendering of their emotions and choice of actions could not really be influenced, or experienced to be guided by their inner states. This is a principle to be evaluated with more complex case studies.

**Principle: “Debugging as Authoring”**

“Debugging as Authoring” is a design principle suggested before in computer science approaches, but has been taken up as an authoring principle. It became very clear with at least the iterative processes performed in “OfficeBrawl” and in “Harold in Trouble” that it is crucial. In all cases in which authors are not completely indifferent about what can happen in a storyworld, there are some more desired consequences of actions or some effects to be avoided in a storyworld depending on user interaction and engine generation. Also, mostly any initially set values or arithmetic rules depend on guessing and need to be tweaked later. Therefore it is necessary to be able to adjust preconditions and effects once content has been entered at a certain complexity. It has been concluded in the last section that current authoring tools would need to be enhanced in order to support authors in that “debugging” process. This spans tasks of technical authoring, but also may influence conception. Therefore, unfortunately in “The Cruise”, the process of implementation has not reached a state advanced enough to check that out. Also in the short case studies of the summerschool, this aspect has stayed mostly irrelevant yet, as the complexity was not reached.

In general, more detailed evaluations and suggestions of more creative principles for Interactive Story Creation is a long-term endeavour. It depends much on arbitrary circumstances (as of who can work with which tools in which context) and reaches beyond the duration of the IRIS project. IRIS has set the ground for continuing experiences and discussions.
6 List of Appendices

This report has the following appendices, which consist mainly of additional material to the case studies, such as drafts, and evaluation questionnaires. Some of the materials can be publicly accessed online at http://iris.interactive-storytelling.de/, others are available on request.

A Additional Material to the Case Study “The Cruise”
A.1 First Version Draft by Georg Struck - “The Downfall of Frank Jefferson Junior”
A.2 Second Version Draft by Georg Struck - “The Reunion”
A.3 Third Version Draft by Georg Struck - “The Cruise”
A.4 Design Drafts (Teamwork) of “The Cruise” Story Modelling
A.5 Generalizing Authoring Problems: The Challenge of Freeform Text Input – Conclusions by Georg Struck
A.6 The Cruise - Reflections of the team members on the collaboration (partly in German)

B Additional Material to Events
B.1 Summerschool Schedule
B.2 Summerschool Questionnaire
B.3 Evaluation Results Summerschool (merged)
B.4 Evaluation Results ACE 2011 Tutorial (merged)

C Additional Material to the Case Study “Office Brawl”
C.1 “Office Brawl” ACE 2011 Poster
C.2 “Office Brawl” Design Drafts (partly in German)
C.3 “Office Brawl” Project Report (German)

D Papers 2011
D.1 “Office Brawl” – A Conversational Storytelling Game and its Creation Process
D.2 Introducing Interactive Story Creators to Conversation Modelling
D.3 Tutorial: Introduction to Interactive Story Creation with Generative Tools and Systems
D.4 A Practical Approach To Introduce Story Designers to Planning
D.5 How Authors Benefit from Linear Logic in the Authoring Process of Interactive Storyworlds
7 References

1) (Dang et al., 2011)

2) (Glock et al., 2011)

3) (Hoffmann et al., 2011)

4) (IRIS-WP3, 2010)

5) (Spierling, 2008)

6) (Spierling, 2011)

7) (Spierling et al, 2009)

8) (Spierling et al., 2010)

9) (Spierling et al., 2011)