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1 Executive Summary

The design of interactive television is a new and challenging task. Beside the very hardware which has yet to be developed for the realisation of interactive television, design patterns have to be found to create adequate and compelling content. The transition from conventional television to interactive television can roughly be compared to the transition from monologue to dialogue, a fundamental step which has been tried in other art forms too, for example epic theatre. In this survey we address some of the problems that arise by bringing interactivity to television. Necessary underlying structures are being investigated. We give examples of solutions that have been found for certain problems in other kinds of digital media – namely the domain of computer games. Finally, suggestions are made on how to create content for interactive television in particular.

Introduction

Conventional television is a more or less completely linear medium. With regard to interactivity, it nowadays basically offers two possibilities of influence by the user: channel-hopping and switching the TV on and off. Whereas the reasons for this are obvious from a technical viewpoint, there are additional constraints to be aware of once the hardware allows the user new forms of interaction. From a formal point of view, interactivity means that the user or *interactor* is in a dialogue with a (responsive) system. But unlike conventional *storytelling systems*, such as a human narrator or a theatre crew, digital storytelling systems, such as i-TV and computer games, comprise no human intelligence that might guide the progress of the story that is being told in a reasonable way. Despite the fact that interactive television can only deal with pre-produced material whereas most computer games produce their images by real-time rendering, they exhibit many common features and characteristics when it comes to interactivity. We regard the technologically and methodologically highly advanced domain of computer games as a fruitful field from which to draw hints and conclusions.

Obviously any aesthetic production bears some sort of structure which will influence the interactivity possibilities with the created system. In a first step we will identify some basic structures for interactive productions. Since the domain of interactive media comprises different forms of media ranging from hypertext to computer games, we cannot expect that all of them will be suitable for our special needs in interactive television. We will single out three special structures that have a strong storytelling component and propose one further structure that we regard as particularly suitable for interactive television.

Providing the interactor with the possibility of selection at least means that the user can alter the progress of the story-line. This gives rise to two other tasks. Firstly, how do we communicate the very fact that there are possibilities of choice to the user? And secondly, how do we enable the author of the scenario to guide the user to a certain degree through the scenario in a way intended by the author? The problem of user guidance will be addressed in chapter 3.

The final chapter is written by two different authors, namely a journalist, Barbara Ostermann and a media artist, Carmen Mac Williams, who try to identify dramaturgical principles for an author to create interactive TV stories. The following two chapters are written by Richard Wages, a scientist, who also send questionnaires to ORF and Sofia University. The last chapter is a conscious break to the next two chapters and tries to focus on dramaturgical principles, which will help to create an interactive TV Story for MECITV, in respect to the technical limitations of iTV (mhp). This leads to the question, which classical dramaturgical principles do exist for a journalist in traditional TV and what will be new for iTV. Then we analyse narrative structures and navigation methods for iTV (mhp) and identify two basic dramaturgical principles for iTV: time management and immersion. We propose time based navigation, which is driven by the content, as a particularly interesting method for iTV.

2 Non-Linearity and Structure:

Definitions for this text:

We call a sequence of events presented to the user a *narration*. A narration always is regarded as one of the possible sequences (*paths*) in the imaginative space of all possible sequences, the actual *story*. By this we take into account that one and the same story may be told (narrated) in many different ways. As one of the many manifestations of a story a particular narration is thus always *linear*, even if the events are not presented their timely order (e.g. flashbacks in movies or books). If such a sequence – which a priori could be completely arbitrary – fulfils the intentions of an author, meaning it is an intended representation of his story or it *does work as a story* in the first place (has 'storiness', [1]), we call it a *plot*.

Providing the user with more direct influence and thus leaving the 'secure path' of linearity gives rise to a problem: the author's decreasing influence on the plot. The terms interactivity and plot might be regarded as antagonists when it comes to stories in different media.

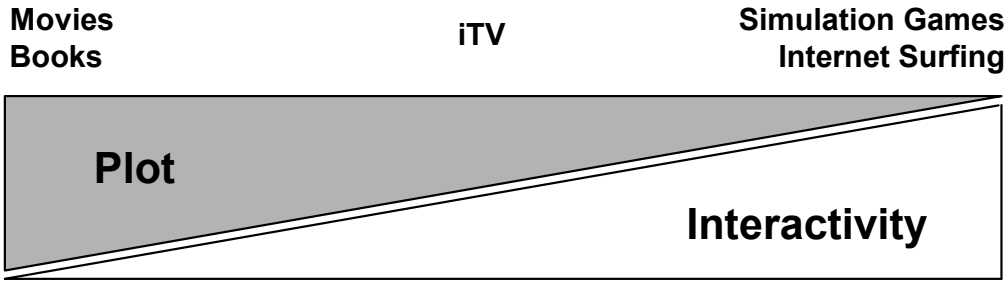


Figure 1: Spectrum Plot vs. Interactivity

In the above figure some types of interactive media are positioned with regard to this ambivalence. By its nature interactive television will take a medial position.

In our definition a story itself does not need to be and usually will not be linear. Hence the author is faced with the question on how to structure his story for narration. This is not only a crucial necessity for the author in order to handle the increasing complexity of his scenario but also to enable the user to access and navigate within the scenario. Besides the 'trivial' *linear narrative structure* (movies, books) there are several qualitatively different further structures – like the well-known tree structure as a special case – which we all subsume under the term *non-linear* and which will be discussed in the following.

2.1 Basic Design Patterns

The structures which we will describe next – following in part definitions of Crawford [3] as well as Samsel and Wimberley [12] – will serve as our basic building blocks. We will see that all further and more complex structures in fact are recurrences of these structures.

The simplest and by far the most important type is the *sequential path structure*. Within our figures each circle (or *node*) represents a given point in time where the user will face a particular place or situation. The arrows (or *connectors*) indicate the potential directions in which the story may progress. Getting from A to B could mean for example a change of location, the setting in of music, a camera move, alteration of the light, or many more other potential modifications.

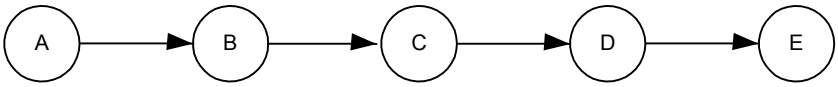


Figure 2: Sequential Path Structure

The progress from one node to another itself might be triggered by the system for all kinds of reasons. Typical conditions are temporal (e.g. time out), spatial (e.g. user navigates to certain place) or logical (e.g. selection by the user). The strength of this structure obviously lies in the total control of the plot. Since this is the only purely linear building block within our collection, it is no wonder that this structure is a representation for a (stop-and-go) movie or a slide show. The user follows a strictly defined procedural path one node after another.

One of the biggest difficulties in designing interactive stories is to find the right balance between freedom of the user on the one hand and restricting the user on the other hand to conserve a dramatic setting of a story. Within the three-dimensional worlds of computer games this problem is even worsened by the fact that the user, in this case player, is invited to navigate freely within the 3D space. Since such a user behaviour can be very time consuming it is clear that navigational options – like selection options – counteract a strict time management as an integral part of dramaturgy. Among all possible structures the sequential path structure therefore has the strongest *temporal* nature. As we proceed through our collection of basic design structures the temporal characteristic gradually fades for the benefit of a more *explorative* characteristic.

As a variation of a linear sequence and thus a first form of non-linear structure one could allow isolated digressions from the procedural path which still constitutes the linear ‘story spine’. We call this a *sequential path structure with cul-de-sacs.* The nodes to the side of the procedural path may offer additional information, footnotes or sub-stories which by no means should be crucial for the understanding of the main story since the user might miss them.

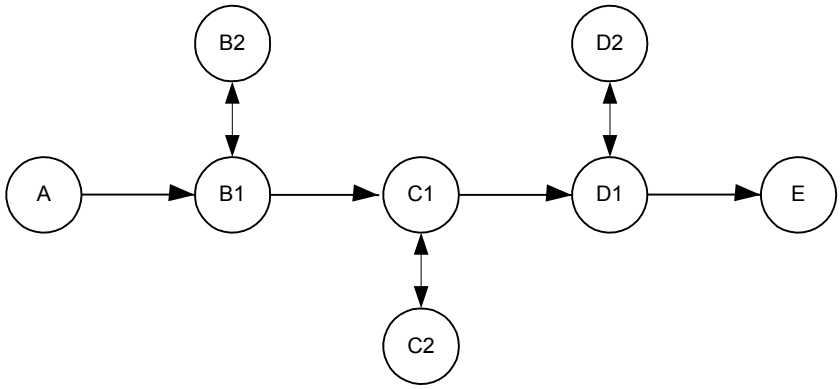


Figure 3: Sequential Path Structure with Cul-de-Sacs

To ensure that the user meets all crucial nodes of the plot containing key information or events they have to be part of the story spine. This structure often is found in children's edutainment CD-ROMs. One can imagine a trip to the zoo. If the child is interested in a certain animal the corresponding cul-de-sac could be linked to huge amounts of archive data or a short movie.

A very popular structure that is often been cited when people explain interactivity is *branching* or *tree structure* because it easily illustrates the fundamental concept of interactivity theory, namely user choice. 'Untamed' branching structures imply the danger of developing an exploding number of different nodes which cannot be controlled in a reasonable way anymore.

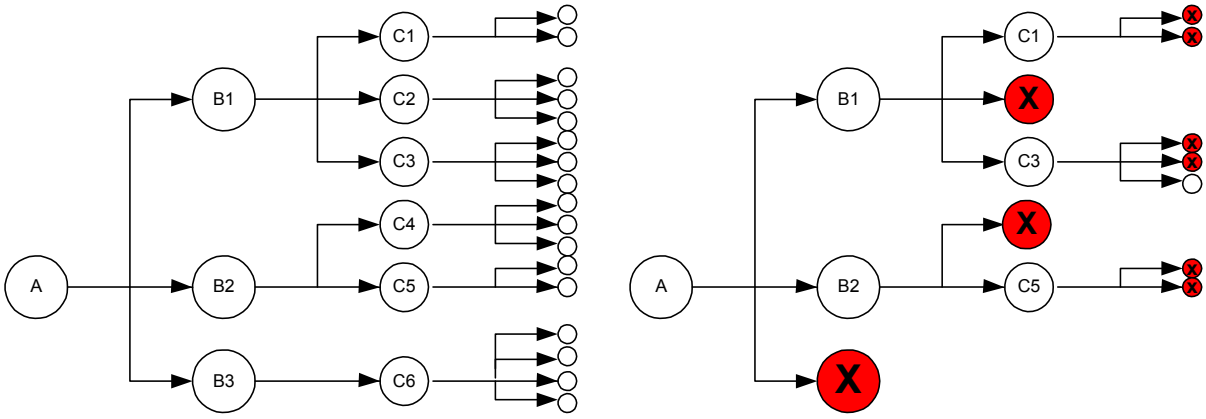


Figure 4: Extended Branching **Extended Branching with Forced Path**

Thus author Neal Stephenson refers to this type of structure as 'the tree of death' due to the unmanageable number of possible outcomes. Since it is practically impossible to fill all the nodes with proper content a popular counter measure is to 'trim' the branching tree. That means on the bottom line there will be only one 'correct' path whereas every 'wrong' choice of the user will terminate the story or respectively will cause a 'Game Over'. Obviously this strongly works against the seamlessness of a narrative experience. Given we have a narrative without timing it means that the user has to start over and in the case that the structure is embedded into a timeline as is true for interactive TV a termination of the story would not make any sense at all. Consequently the *branching with forced path structure* is more or less only found in computer games which have a 'save' function.

A more reasonable way of taming this structure from a narrative point of view is to converge the formerly branched paths back into a single node of the story spine. The *branching with bottlenecking* or *foldback structure* offers clearly distinguishable paths and still allows for the author to keep the scenario manageable. In the end it will lead to the final destination of the story as intended by the

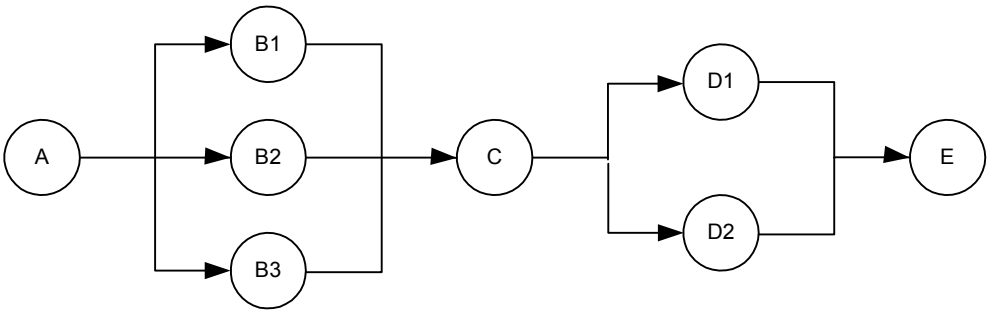


Figure 5: Branching with Bottlenecking or Foldback Structure

author. Hence this structure has to be regarded as suitable for interactive movies where interactors can make substantially different experiences while a control of the runtime is still possible.

The same is true for the so called *parallel streaming structure*. It allows for example the author to create a single linear story where the user is able to switch between different perspectives, paths or

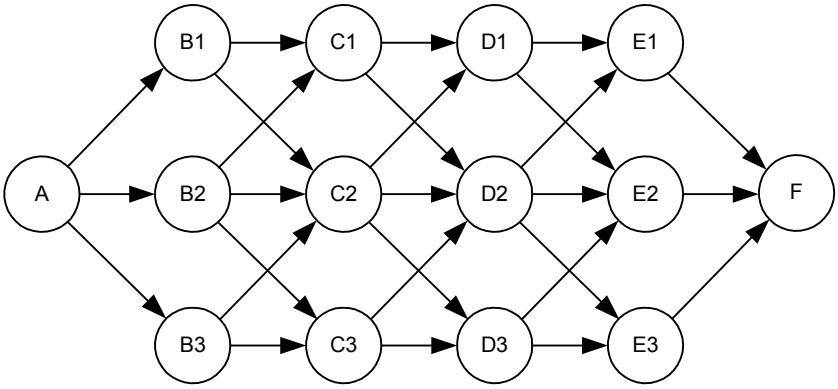


Figure 6: Parallel Streaming Structure

states. On the other hand radically different outcomes as for example ‘boy meets girl’ versus ‘boy does not meet girl’ which could easily be created with the above branching structure cannot be achieved with the parallel streaming structure due to the fact that the ever possible switching of story lines also demands the content of the nodes to be closely related if the nodes are close to each other. Still this particular structure might be exploited in an interesting way for interactive television when we project a movie like ‘Rashomon’ (1950) by Akira Kurosawa onto this structure. The movie’s story takes place in ancient Japan. A woman is raped and her husband killed. Consecutively, the film gives us four partly congruent and partly contradictory viewpoints of the incident – one for each defendant – each revealing a little more detail. The answer to the question which version, if any, is the real truth about what happened is left to the audience.

We end our list with a last basic structure element, the *multilinear* or *hypermedia structure*. Though it offers many possible choices for the user within every node (in the below diagram there could even be more arrows between the pictured nodes) it is probably impossible to embed some sort of story line within this structure.

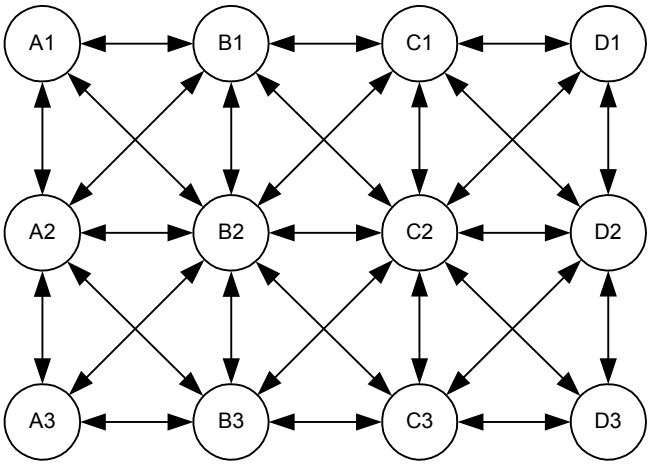


Figure 7: Multilinear or Hypermedia Structure

Usually we refer to the possibility of going to everywhere from everywhere as *browsing* or *surfing*. The nature of this structure clearly is entirely exploratory. We will rather come across the multilinear structure in a hypertext document like an electronic version of an encyclopaedia than in any other digital medium that requires at least slight temporal arrangement.

The standing of the listed basic design patterns can now easily be recognised in the spectrum of figure 1 when we move from left to right. Unsurprisingly we will use them to construct more complex structures by combining them in three – again – qualitatively different ways.

2.1.1 *Splicing*

The easiest and most intuitive way to combine our basic design patterns is to 'paste' them together on a plain with the help of connectors. This already gives rise to an infinite number of possible patterns and has not to be explained any further. As an example we could obtain the parallel streaming structure in figure 6 by the splicing of three sequential paths.

2.1.2 *Hierarchy*

A more sophisticated technique of combining is to introduce some sort of hierarchy. That means an entire own structural entity is situated within a (hierarchically higher) node. Entering this particular node basically connotes to enter the (hierarchically lower) structural entity, which inversely can only be left via this node. We may as an example have a node C of a sequential path with a subjacent multilinear structure.

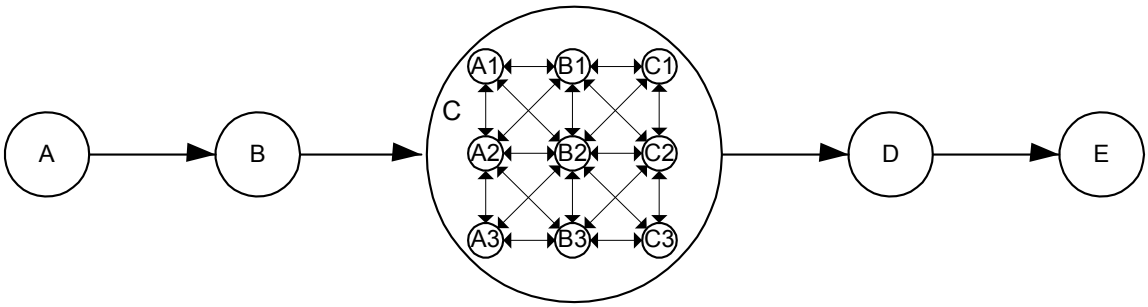


Figure 8: Hierarchy

By this we might embed an exploratory chapter for the user within an otherwise strictly straightforward story progress. In doing so the entry and exit nodes for the multilinear structure might be made dependent on the user's former actions (e.g. in node A).
Thus we can again construct infinitely many new possible structures, especially if we take into account that we might have more than just two (like in the above example) hierarchical steps. We could iterate this method and for example insert another structural entity into node C3. The essential concept always is to have a structure encapsulated inside a node of higher hierarchical rank.

2.1.3 *Re-Entry*

For this blending technique we at last give up the concept of strict encapsulation too. We now could for instance have a situation where a particular node (C) of a structure 1 'contains' a structure 2 which in itself has a node (B2) 'containing' structure 1.

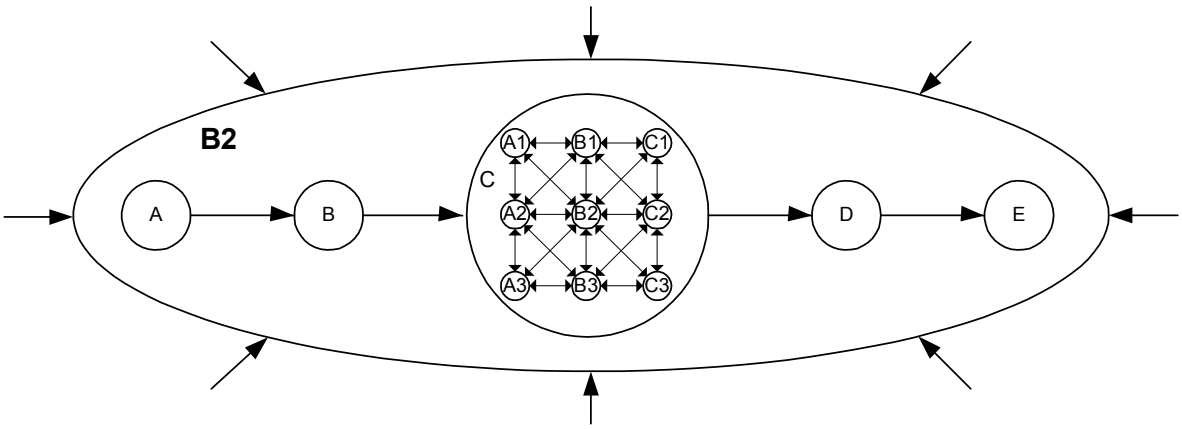


Figure 9: Re-Entry

In truth none of the two structures contains the other and neither one could be of a higher hierarchical rank. The behaviour of systems with intrinsic infinite loops like this might be as fascinating as unpredictable and is a field of research on its own. Introducing this kind of structure goes beyond the scope of most domains of interactive media including interactive television at its current developmental state.

We end our survey on structures for interactive media in general at this point and turn to the field we want to apply it to.

2.2 Narrative Structures

> There is a reason why 95 percent of the interactive titles out there suck. They suck because they have nothing to do with what an emotionally engaging story is. Nothing. Five years from now someone will say, You mean they used to do interactivity without three-act structure? Three-act structure is not some kind of Hollywood conceit. This is something that was refined in the body of dramatic literature over the past three thousand years. Three-act structure is a way to dramatically create an emotionally resonating experience. The fact that most interactive stories lack a three-act structure points to the fact that they are not made by storytellers. They are made by technologists.
>
> Douglas Gayeton

Much has been – and still is being – argued on how or to what extent interactive storytelling can be made possible in the (near) future. The predictions and expectations are ranging from repudiation to euphoria (not only) among writers and media scientists:

> In life, we make a decision – or a decision makes us – and we go one way; had we made a different decision ... we would have been elsewhere. The novel with two endings doesn't reproduce this reality: it merely takes us down two diverging paths. It's a form of cubism, I suppose. And that's all right; but let's not deceive ourselves about the artifice involved. After all, if novelists truly wanted to simulate the delta of life's possibilities, this is what they'd do. At the back of the book would be a series of sealed envelopes in various colors. Each would be clearly marked on the outside: Traditional Happy Ending; Traditional Unhappy Ending; Traditional Half-and-Half Ending; Deus Ex Machina; Modernist Arbitrary Ending ... and so on. You would be allowed only one, and would have to destroy the envelopes you didn't select. That's what I call offering the reader a choice of endings.
>
> Julian Barnes

> There are probably not two more difficult things to predict in this world than the future of art and the future of software. These visions of the future can only be speculations, extrapolations from the current environment, which is shifting even as I write. The computer is chameleonic. It can be seen as a theater, a town hall, an unraveling book, an animated wonderland, a sports arena and even a potential life form. But it is first and foremost a representational medium, a means for modeling the world that adds its own potent properties to the traditional media it has assimilated so quickly. As the most powerful representational medium yet invented, it should be put to the highest tasks of society. Whether or not we will one day be rewarded with the arrival of the cyberland, we should hasten to place this new compositional tool as firmly as possible in the hands of the storytellers.
>
> Janet H. Murray [9]

At the same time author and programmer Chris Crawford who is working on the subject interactive storytelling for more than two decades now and is one of few persons who has actually developed a system for interactive stories (Erasmatron Story Engine) points out that authors are still too bound to classical concepts of how stories are told when they approach interactive fiction. He argues for a new attitude towards this new art form.

> If you insist that an interactive *Romeo and Juliet* must be about Romeo and Juliet, then you must also insist, that it follows the plot of the original play. But if instead you shift your point of view and require that an interactive *Romeo and Juliet* be about the collision between love and

> social obligation, then a great many plot developments are possible and remain true to the work.
>
> Chris Crawford [3]

Interestingly enough Crawford also turns out to be the author of one of the first books on computer game design ([2]) ever written. As we stated before we regard the computer game branch as trend-setting when it comes to interactive design and concepts. Unluckily the overwhelming majority of recent computer games contain little to none story components and among developers of computer games there is a lot of scepticism whether the two concepts – story and gaming – can be blended in the first place ([6]). The problems reported from within the industry sound familiar:

> One of the primary story problems that many computer games have is that their stories are written by people who wish they would write in a more linear medium. [..] Sometimes the game developers themselves secretly or not-so-secretly wish they were working in another medium and make their story writing choices accordingly. [..] These designers often start emphasizing the cinematic nature of their games, sometimes attempting to deny that they are games at all by calling them 'interactive movies'. The games' cinematic cut-scenes become longer and longer, with the predetermined story line dominating the gameplay completely.
>
> Richard Rouse III [11]

Nevertheless there is a strong and constant effort in parts of the computer game industry to find solutions for this problem, namely within the sector of adventure games which brought up some of the best selling games ever (e.g. Myst series). The future developments will be of big interest for any branch of interactive media since well-known classical story concepts are integrated (e.g. The Hero's Journey, nine-act structure [4]) and sometimes the solutions are completely innovative, like the training of a character in 'Black & White':

> In a perfect world, people wouldn't need gods. But perfect worlds can't exist and sooner or later someone, in trouble, desperate, will pray to the heavens. This is what happens in the beginning of Black & White. Your new tribe bow before you in awe, and from this moment your prayer power starts to grow. As you carry out godly acts, the belief in you rises and more and more people are convinced that worshipping you in the way forward. But you can be good or evil. You may choose to rule the world as you wish. As you grow in power, you acquire a Creature, a wondrous being capable of doing anything you can do. Capable of learning and being trained and capable of making his own decisions. The people of Eden, whether they believe in you or not, can't failed to be impressed by this beast, and more are swayed to your cause through their admiration of the Creature and the god that owns him. But on other lands there are other gods. They have their own Creatures and their own followers. You must vie with them for power. You must use your Miracles, your Creature and your cunning to steal followers from these gods, and to do battle between the Creatures for supremacy. The ultimate goal is the Creed. Elements of these live within each Creature, and he who controls the parts of the Creed can control the whole land of Eden. You may do well. You may sway the minds of the tribes, but can you gather the parts of the Creed? Can you defeat the god of gods, the enemy of enemies? Can you defeat your Nemesis and rule over the whole world? That is a question only you, and only time will answer.
>
> Black & White, Story [7]

For our necessities we will now list some structures that already have proven to work in interactive productions with a more or less narrative component. Theses structures were found empirically and described by Skov and Andersen [13]. After interviewing different authors (from the domains multimedia and computer games) they identified three significant narrative structures with different characteristics that allow for different levels of complexity.

One of the simplest narrative structures for an interactive narrative is the *single selection path structure*. Although the user is presented with various (in this case three) options, only one selection will actually trigger progression. For example, in situation A, the user may proceed by selecting S1, S2, or S3, whereby only S2 is considered 'correct' because it advances the narrative. If the user chooses an 'incorrect' option (S1 or S3) he will return to the same situation and be forced to choose from the same group of options as previously.

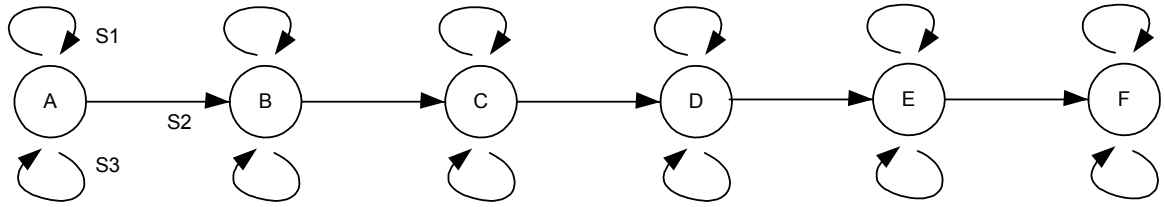


Figure 10: Single Selection Path

This will also prompt feedback from the application for example indicating the user has made a 'wrong' decision. In effect, the user is guided down the only single (linear) path possible – the one intended by the author. This structure is characterised by its *highly temporal nature*, in that events progress in a logical and timely sequence. A typical application that holds a single selection path is software for the training of a specific task. The selection of 'wrong' versus 'right' choices is used for evaluation purposes.

In the more complex *multiple selection path structure* the user may select from various paths to advance through the narrative. This enables different users to experience the story progression in different ways. In contrast to the single selection path structure, this structure is less limiting to the user. Authors used this kind of structure for multimedia assessment and training systems in which the users were faced with difficult and complex situations. Of the options with which they are presented at any given point in time, no option can be considered 'incorrect' because each selection will necessarily trigger a progression. We recognise this structure as a slight variation of the branching with bottlenecking structure (figure 5). The stylised clock from node D to node F represents a timeout, meaning that if the user does not act in this situation within a given timeframe the situation will timeout and the narration continues regardless of the lack of action.

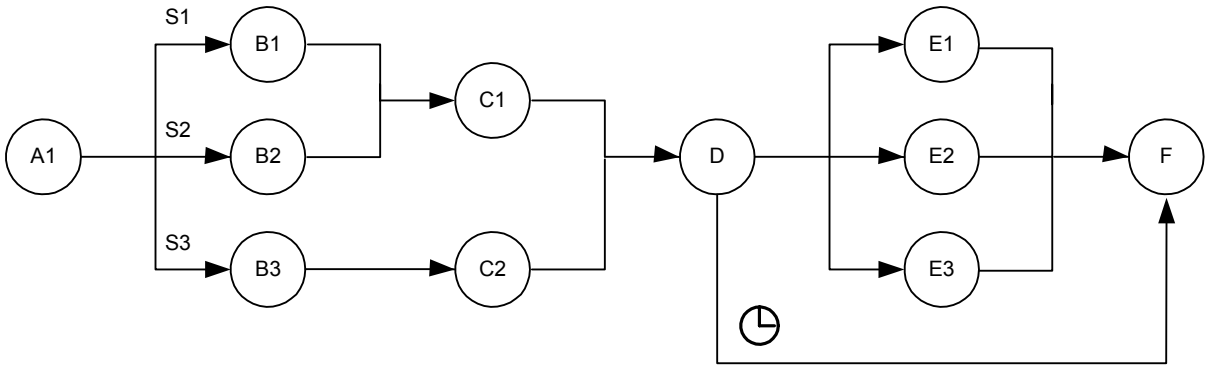


Figure 11: Multiple Selection Path

Ultimately, the author's intended goal will be achieved, although the paths toward that goal may vary. Assuming different users will choose different paths, they can encounter unique experiences of the narrative. Their experience is thus more spatial, though inevitably the nature of the narrative remains temporal. Hence this structure might also still be suitable for interactive TV.

In contrast to the two previous narrative structures, the *multiple exploration path structure* allows more spatial exploration in a narrative and is not necessarily temporal in character. Furthermore it has a hierarchical structure. In figure 12 the nodes A, B and C represent environments within which the user can navigate relatively freely. This narrative structure is common for many computer games – especially from the adventure genre – allowing the user to explore for example different rooms, levels or even worlds. But even this structure can be considered limiting in that the fulfilment of certain requirements is necessary to advance within the narrative. We could imagine for example, that the node B is not purely exploratory, but that the user can only proceed to C if he has accomplished a certain task, e.g. a certain piece of information has been obtained.

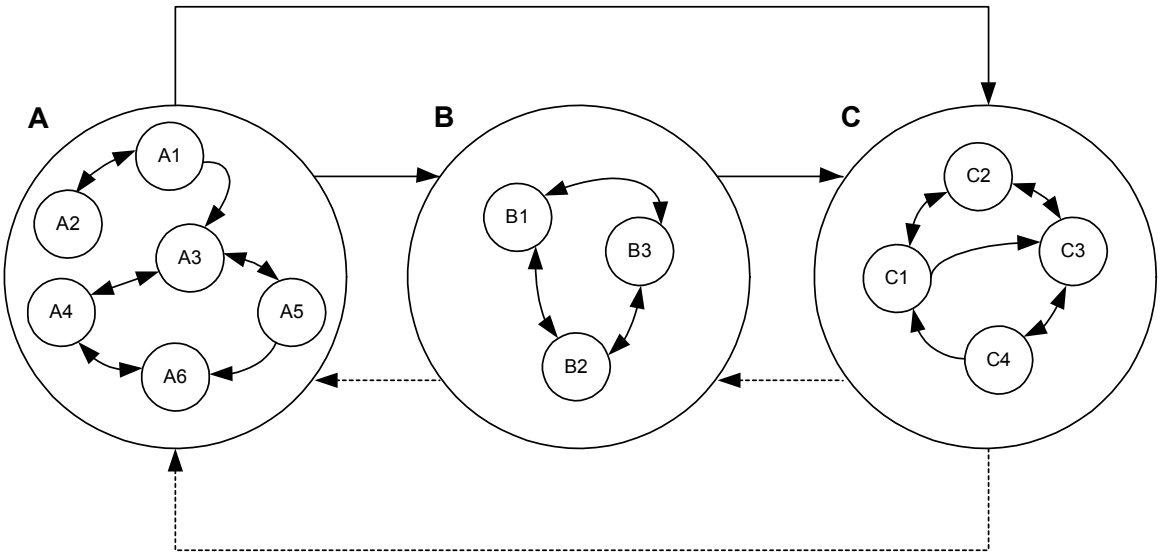


Figure 12: Multiple Exploration Path

While this structure offers a wide range of possibilities for a more open narrative and the user is able to control, interact and navigate within the various environments with a great deal of freedom, one could envision a narrative flow from left to right if we discount the dotted lines. Allowing the user to progress along the dotted lines too entails a total change of the structure from a narrative point of view. In this case the nature of the structure will be completely spatial and not at all temporal.

3 User Guidance

In January 1987 the two big German public broadcasting stations ARD and ZDF invited the viewers for a TV thriller entitled 'Wer erschoss Boro?' (Who shot Boro? ZDF/ORF/DRS, 90 Min, Script: Herbert Reinecker, Director: Alfred Weidenmann) with the appeal: 'You are the commissar!' The first part, 'Einführung', (30 min.) presents the crime story and the actors and invites the viewer to solve the case. The second part consists of two videotapes. A man called Boro is found murdered in his home, and the suspects must be investigated. A 30-minute wrap-up tape, 'Schlussteil', reviews the facts and reveals the killer. Besides an in advance publication of a fact book the two versions of the second part were put on air in parallel by the broadcasting stations. The viewer was able to switch between the view of two different protagonists – hence also two different camera positions. Although this was a completely novel and unique feature the resonance was more than disappointing. Most of the viewers did not change the channel at all but watched one of the versions like any other conventional movie.

One could argue that more people would make use of the character switching option nowadays, since most of the viewers are much more familiar with selection in front of a screen due to the internet and the increased number of (private) channels. But still it is of great interest what prevented the viewers in those days from taking advantage of this new basic opportunity of interactivity.

In this chapter we will collect possible ways to address two problems:

As fortified by the above example it will be necessary to communicate the very fact that there are possibilities of choice to the user.

As a broadcaster we could have motives like: if the users chooses to interact very much or in a certain way, we can make more money, i.e. how do we lead the user into a situation where he can order something or choose a favorite candidate by telephone / SMS / fax or lead him to advertising? How do we guide the user to a certain degree through an interactive scenario in a way intended by the author?

We will have a look at methods that have been shown to work in other interactive media and in particular computer games will give valuable references. Concrete examples are listed of ways to give the user answers to user questions like

- Where am I?
- What time is it (real or virtual)?
- What are my options?
- What can I expect?
- What is expected of me?
- Who else is (out) there?
- Where can I have fun?
- What can I buy?
- Where do I come from?
- Where can I go to?

and in times of interactive storytelling which might involve some sort of role play even

- Who am I?

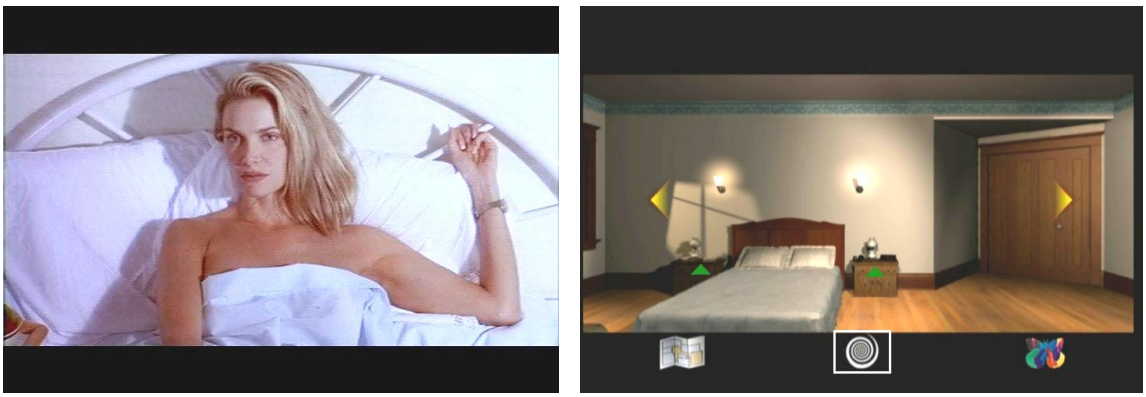
Insofar these questions are answered the user will probably feel comfortable and thus is more likely willing to go into the interactive programme. On the other hand the broadcaster might want to obtain

some information about the user too. Due to the current state of development of interactive TV the options for this are still very restricted.

3.1 Frames and Dialogues

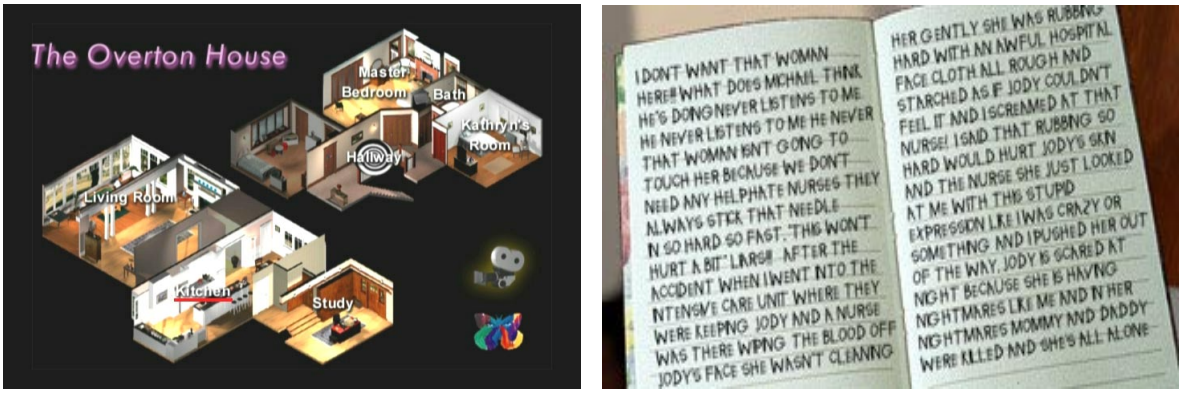
A basic precondition to make a viewer a (pro)active viewer is so obvious that it is easily forgotten: the viewer has to perceive that he is watching an interactive TV programme. There are many eligible signs we could send towards him, like a flashing red dot or a beep sound. But after years of using Windows or Macintosh operating systems the probably fastest and best understood sign will be a frame around the film's picture. And as we are familiar with (from diverse everyday software applications) this frame could already contain much additional information in form of a menu.

The like was done for an interactive movie on DVD, 'Tender Loving Care' (TLC [14]). The cast includes a beautiful, deluded patient, her husband and a mysterious, seductive psychiatric nurse brought in to care for the wife. The way the scenario works is that the viewer is shown a bit of the feature length film and then is given a chance to interact with it.



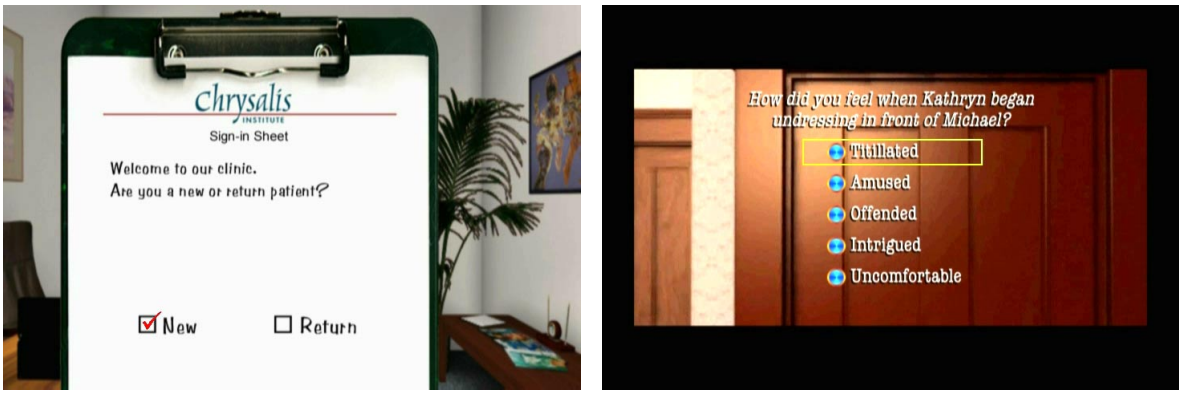
Movie Screenshot, Menu (Tender Loving Care)

The interactive parts include exploration of the rooms in the house and taking psychological tests or TATs (Thematic Apperception Tests). Voyeuristically exploring the house, reading diaries and investigating people's rooms uncovers clues that can be used to figure out what is (and was) going on.



Map, Diary (Tender Loving Care)

The TAT test results uncover elements of the user's personality and are used to create a progressively accumulating personal psychological profile. Not meant to deliver a real psychological exam, the tests however affect how the storyline will progress.



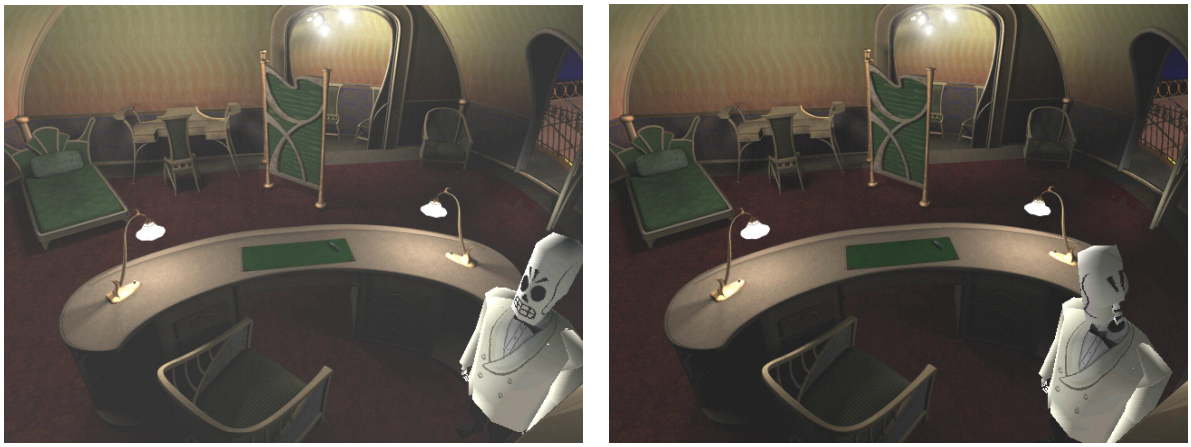
Query, TAT (Tender Loving Care)

Thus we already have an example of how an author can use queries to guide an interactor alongside an underlying non-linear narrative structure. On top he can use the actual choices the interactor makes as a feedback and store it as a *behaviour record* or – with regard to computer games – as a *score*.

In TLC these interactive sequences always pop up automatically after a certain fraction of the movie material was played, the actual movie is halted. This is of course not beneficial for the narrative flow but compromises the blending of unchangeable film material and rendered scenes for interaction. Suppose we want to produce content for interactive TV which does not use other than film material. Obviously all possible movie paths will have to be filmed in advance. Again we could think of a flashing red dot or a beep signal to communicate opportunities for user interaction. For 'Grim Fandango', a film noir style computer game ([8]), LucasArts came up with a different solution.

> In this game Manny Calavera is a 'travel agent' in the 'land of the dead'. His job is to sell people the best possible travel package through the land of the dead to the 'ninth underworld'. But something is wrong recently, all the decent clients have gone to other employees of the firm and he is forced to deal with criminals whose best travel package consists of being put in packing foam and being shipped off. After being introduced to a group of undercover rebels and Manny's big love Mercedes Colomar one learns the truth about the land of the dead and embarks on an adventure to find and save Mercedes.

The game is played with cursor keys. Thus no mouse pointer is obstructing the beautifully composed pictures. Whenever there are interaction possibilities this is indicated by a simple tilt of the protagonist's head towards the person or object of interest. Hitting the return key will then trigger the interaction procedure. A method as simple as this one could easily be adopted for interactive movies and iTV.



Interaction Indication (Grim Fandango)

Like its pictures Grim Fandango's dialogues are elaborately designed (e.g. all characters speak with a Mexican accent) and witty. To handle dialogues an assortment of pre-formulated feasible answers or questions – four at each time – is presented to the player of which he can pick one.

Dialogues (Grim Fandango)

Similar to the queries in Tender Loving Care the actual choices a player makes are used to determine the further development of the story. What both productions have in common too is, that they have built-in points of no return to guarantee the advance in the narrative flow. In Grim Fandango these are usually combined with movie-like cut-scenes. It is save to say that the underlying structure of the latter artefact is of the same category as in figure 8 of the second chapter whereas the underlying structure of Tender Loving Care is branching with bottlenecking (figure 5). The record of the interactor's answers will only be used to produce an extensive written psychological analysis at the end of the film ([14]). Thus in neither of the productions there is a chance of temporal navigation.

3.2 Missions

All the above methods have one thing in common: they are rather methods of *firm* or *inflexible* user guidance. Not necessarily ruling out the utilisation of such methods many computer games in addition employ *missions* for the interactor. With a mission we identify a certain task to be fulfilled assigned to the user as far as possible appropriate to the narrative progress. Especially computer games which offer a great deal of free spatial navigation within colossal 3D worlds bear the danger that a gamer gets lost or does not have the slightest clue where to go and what to do. So, these games usually inform the user about the global situation, the goal to be reached and sometimes even about the very outcome of the scenario. This does not need to spoil the suspense for the user at all and it is a technique that was used in classical narratives for centuries. In the very beginning of Romeo and Juliet for example it is clearly stated that this story is about a boy and a girl who fall in love and that they will die in the end. Still we are curious and much enjoy to hear the story.

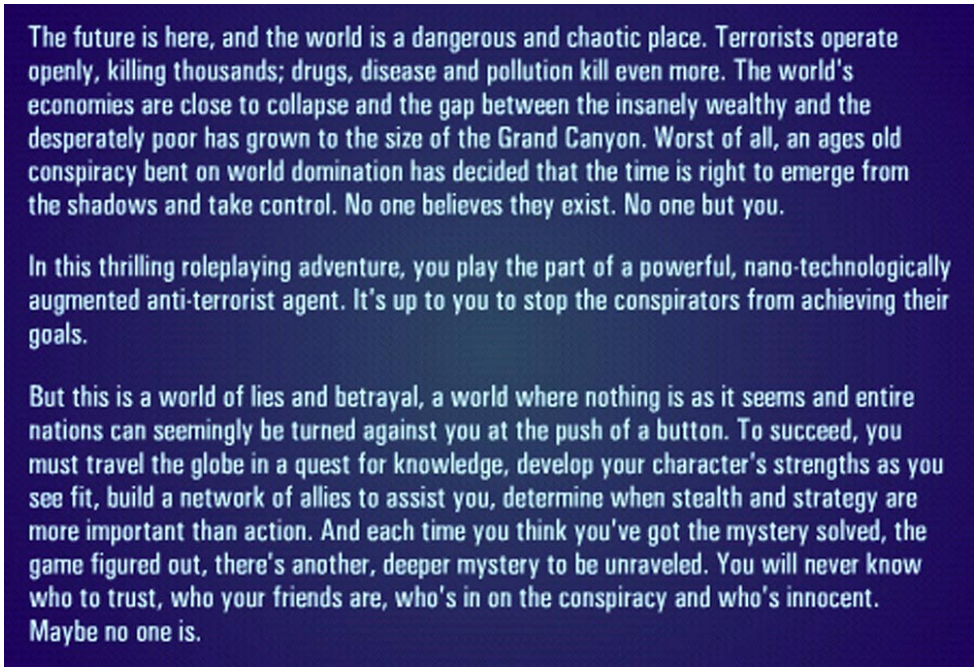
In terms of story structure we may roughly distinguish three different types of story parts by their respective 'size':

- Global Story
  The entire story, e.g. the Black & White story (chapter 2)

- Contained Story
  An in itself closed portion of the entire story, e.g. one of Rashomon's viewpoints

- Particle Story
  A series of events that belong together logically, but do not get across as story, e.g. a protagonist orders food by phone, the doorbell rings, the food is delivered

Computer game designers often use missions of various extents to 'simply' tell the gamer what to do. Although usually categorised as a role play game and first person shooter 'Deus Ex: The Conspiracy' ([5]) might serve as a good example to illustrate this concept. When the user starts the game he follows the cut-scene dialogue of two (evil) characters which informs him about the overall situation:



Global Story (Deus Ex [5])

Thus he is already familiar with the global story and knows his *long term mission*. As soon as he gets to the actual game play at the docks he is approached by a (good?) character who even provides him with more information. The first self-contained task (contained story) is to get access to the Statue of Liberty in order to free a person, as the character tells the user before he disappears again.

Player's View, Particle Story (Deus Ex)

The fulfilment of this kind of *middle term mission* coincides with an advance in a level, again, there is no way of returning once it is completed. Apart from the cut-scenes the player's view is always a first person view for the entire duration of the game. In addition to what he sees while he is exploring and fighting within the virtual world he is provided with information about his health state, orientation and equipment which is shown in the visor of his helmet (frame). From time to time he will receive 'incoming messages' from a supervisor who will give direct orders where to go and what to next. By doing so the middle term missions are broken down even more into *short term missions* (particle story).

Overall this method of graded user guidance shows to be very effective. The timeline-triggered mission assignments circumvent longer periods without any action and keep the player moving along the author's plot.

There are definitely many more good examples for the implementation of the above methods and some others in computer games and other interactive productions which cannot be listed entirely due to their mere number. In the below table we list the methods for user guidance we found in these productions and with respect to interactive television the (few) opportunities of possible feedback for a broadcaster.

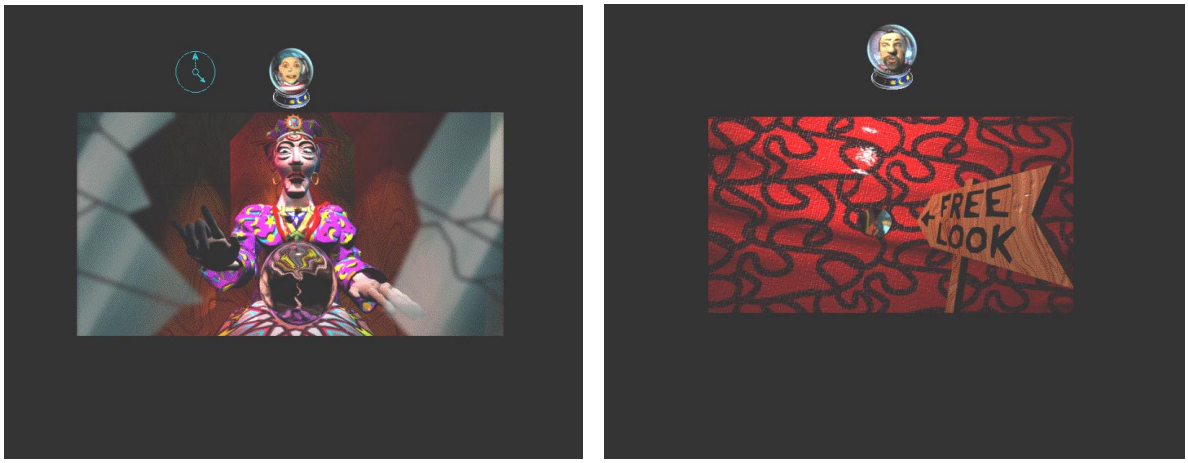
User Guidance	**Broadcaster Feedback**
General / Structural	
Level / Underlying Narrative Structure / Rules	User Behaviour Record
Score / Equipment / Handicap	Score
Guide / Advisor / Narrator / Moderator	
Autonomously triggered Events (Time Dependent)	
Direct Choice / Button	
Arouse Interest / Jeopardising	
Clarification / Camouflage	
Mission (Short / Middle / Long Term)	
Sound / Music	
Loud / Quiet, Dependent on Direction	
Environment Information (e.g. Striking of Clock)	
Excitement Sounds (Dramatic Music, Heart, Breathing, ..)	
Attracting / Compelling Noises	
Interaction Indicator	
Visual	
Navigational Constraints	
Guide / Advisor / Narrator / Moderator	
Interaction Indicator	
Takeover by the System (Cut Scene / Camera)	
Bright / Dark, Contrast, Movement	
Signs / Text	Fax / SMS / Query via Return Channel
Environment Information (e.g. Clock)	
Non-textual Signposts (Doors, Ladders,.)	
Attracting / Compelling Scenery	
Emphasizing / Camouflage	
Dialogue	
Guide / Advisor / Narrator / Moderator	
Overhearing Dialogues	
Call	User makes phone call
Conversation	User's Dialogue Behaviour Record
Judgement / Praise / Reproach	

3.3 Associative Interference

We end our survey on user guidance methods with yet another example from the domain of computer games which has an out of the ordinary feature we only found in one interactive production. In 1995 The Residents, also known as 'The World's Most Famous Unknown Band', developed a computer game entitled 'Bad Day on the Midway'. The cover describes it as a 'unique role-playing game that transports you to a Carnival Of The Damned where the characters are the rides'.

> When playing *Bad Day on the Midway*, you take on the roles of the various characters, looking at the midway world from inside their heads. You can jump from one to another when they meet while you explore the midway world. As events unfold, the CD-ROM program changes the character's goals and actions, making the interactions more complex and unpredictable than those in a regular adventure game. To add another level of chaos, The Residents had a randomiser built into the program so that the exact way the goals change varies from play to play – it is practically impossible to get the game to follow the same course in play after play. Even if you manage to get to the end without being killed by the psychotic killer or the other dangers on the Midway, you aren't done with the game. For one thing, there are all of the animated stories about the characters to search out (there are eight of them), not to mention the other attractions (*Torture's Top Ten*, *Marvels of Mayhem*, and the *Kill a Commie Shooting Gallery* (each have their own animated artwork). There are also multiple endings (in addition to "You Have Been Killed By The Psychotic Killer" and other generic "Game Over" endings, which you'll see soon enough): some of them happy endings (sort of), and some decidedly not. There are at five of these, some of which can only happen under very exacting circumstances, and you'll probably want to see them all.
>
> Bad Day on the Midway, Story ([10])

A player needs to make character transitions to explore the scenery entirely and he must do this on a regular basis to stay alive. Lingering 'in' one of the characters will most certainly lead to an early death within the game. Again the frame is used to inform the interactor about his 'personality status' by showing a picture of his current character within a small crystal ball.



Game Time, Character Status (Bad Day on the Midway)

The game limits the maximum period a player can spend on the midway. Hence the frame is also used for information on the time left for the user. Accompanied by a strike a clock pops up regularly within the frame.

But the by far most interesting feature is the usage of the lower frame part: on five different positions single words, phrases or entire sentences suddenly appear and then fade again. Sometimes all of them add up to a proper sentence, sometimes they are directly connected to what the character is talking about or what can be observed by the time. The words might most likely be reflections of the

Associative Interference (Bad Day on the Midway)

current character. At other times however they seem to be completely unrelated to the actual events. Probably the apparent confusion (in the anyway surreal setting) was intended by the authors – the fact that the phrases are not even arranged on a straight line strongly argues for this.

We have not found another case where this method of associative interfering was exerted. Our habit to read subtitles of a movie whenever there are any also works with these annotations and it is comparably difficult to ignore them. Whether the user likes it or not, his thoughts will be lead astray or turned around in some way.

4 Identification of dramaturgical principles for MECITV

This final chapter is a conscious break to the other two chapters above (which are written by Richard Wages, a scientist at the LMR). It is written by the same two authors of MECITV, namely the journalist Barbara Ostermann and the media artist Carmen Mac Williams, who will be the authors of the prototype iTV Story for MECITV. By nature this chapter is more practical oriented, we asked ourselves, which kind of dramaturgical principles do exist for a TV Journalist to create an iTV Story and which dramaturigal principles can we employ for iTV in respect to the technical restraints of mhp, today.

4.1 Principles of dramaturgy for journalists under the aspect of iTV

4.1.1 What are the main tasks of journalistic work ?

The role of the journalist is described as the so-called forth power in society.
He has to watch and report about the developments in society whether they may be of economical, ecological, artistic or scientific nature. He has to control the state powers namely the executive, the judiciary and the legislative in their work.
In this role he is not only the one who controls and reports about it he is also someone who has to entertain with his knowledge to make the audience listen to his story.
The journalist lives in competition with other journalists. Who has the best the newest story will earn the most money. So he aims to be the first with the news, the story and to be the one who writes or realises it in the best way. To achieve this aim he has to follow certain rules of dramaturgy and journalistic principles.

4.1.1.1 being new

The main task for a journalist is to bring something new whether it maybe completely new because it just had happened or in a way new that it brings a new aspect or more, deeper information about a topic which is known.
This thing we have to keep always in mind when we talk about journalism and interactive TV.

4.1.1.2 giving „objective information“, showing the other side

People who listen to a story want to get the right which means the most objective view of an information. If they are betrayed or something is researched in a wrong way they wont buy this newspaper again (if we watch journalism from an idealistic point of view). So the journalist has to research all important aspects of one story and present them the audience.
So one task of a good journalistic work is always to show the other side. The most completely view of the things.
This thing we have also to keep in mind when we talk about journalism and interactive TV.

4.1.1.3 present the information in an understandable and attractive way- to entertain people

During making the story or for us especially interesting during making a film the journalist has to follow certain principles of dramaturgy and journalism and methods which differ from the journalistic form he chooses (news, report, reportage, comment, feature, portrait). He uses these principles to inform the audience and to entertain it.

He should do this

- by explaining the five w`s : who did when what where why
- by choosing a fate which inhales all or some aspects of the topic
- by persons who can express themselves well and can talk about the topic from different point of views
- with pictures at the beginning which are so interesting that the eye of the spectator is attracted
- by pictures which are interesting, vivid, explain the story by itself
- by a story which creates suspense, follows a certain dramaturgy by making the audience watch and relax to understand the information
- by a text which describes, analyses but let the pictures of the film talk too
- by graphics for topics which are too difficult to be explained by pictures
- a voice who creates suspense by speaking
- music which creates suspense
- sound which creates suspense or is authentic

Those principles and methods we have also to keep in mind when we are talking about journalism and interactive TV.

4.1.2 How can interactive TV help the work of the journalist

Interactive TV should for that help the journalist to report about something new in a better way or help him to show the other side or help him to entertain the audience in a better way.

4.1.2.1 being new

ITV can on the one hand help the journalist to be more top actual, newer than in a linear way perhaps by showing things simultaneously and offer the audience the possibility to switch to the place it is the most interested in (e.g. 11.september world trade centre report from different regions, switch from one region to another from New York to the Pentagon or another example: national elections switch from one country to another- this example helps him to show the other side, too in a very quick way).

4.1.2.2 giving objective information showing the other side

On the other hand interactive TV can help the journalist to give more deeper information, show the other side. For example in an interactive film that deals with different topics let us say a reportage from Hungary. The main film presents different persons of the new Hungary after the break- down of the wall. In parallel films i TV offer the audience the possibility to get deeper, more information of one topic of the main film. So the spectator can decide whether he wants to watch the main film or wants to get deeper information about one of the persons, aspects of the film in a parallel film.

4.1.2.3 present information in an understandable, attractive way, entertain people.

The danger of iTV is that too many pictures and stories irritate the audience so that it is not any more attracted by the story. So I TV has to follow certain rules to keep the suspense of the audience.

- The point where the spectator is invited to switch in a new story has to be not an evident break for the suspense of the first film
- the second film has to create its own suspense by the above described journalistic principles and methods and dramaturgy
- the dramaturgy of the second film must have a concept in a way that there is a logical possibility to come back either to the first film or to switch to the third film this means
- that the first film must have a dramaturgy which allows the spectator at a certain point to come back to the story from the second or later from the third film without having missed essential information's of the first film
- so by making concepts for these several films it is necessary to create a common dramaturgy for all the films
- all these aspects may differ if we talk about live events (f.e. 11.september) but we always have to keep in mind that the audience has to have the possibility to come back which means to follow and to understand the different films or news or moderators if it switches at certain points

4.1.3 Result

Interactive TV can help the journalist by being top actual, giving deeper information, showing the other side and entertain the audience if certain rules of dramaturgy get respected.

4.2 Dramaturgical Principles in respect to iTV

The original idea for MECITV was to allow the consumer access to TV film archives in order to modulate their own film stories. In a common meeting with the EC project officers we agreed to focus our research focus on the author instead of the consumer (and maybe focus on the consumer in a next research project). In this project we develop computer programs for the author to have fast access to digital films (archives) and to create interactive TV stories with emergent behaviour, which allow the selective recombination of different video sources. The consumer will watch a pre authored non-linear TV story, in which he can navigate, but can not access himself additional film material from TV archives. So for MECITV we try to identify dramaturgical principles for an author (in this case a journalist) to create a non-linear story for iTV (in this case mhp).

4.2.1 Time Management

One basic problem is that interactivity can destroy narrative structures. One example for a narrative film structure is the following (Alfred) Hitchcock-curve.

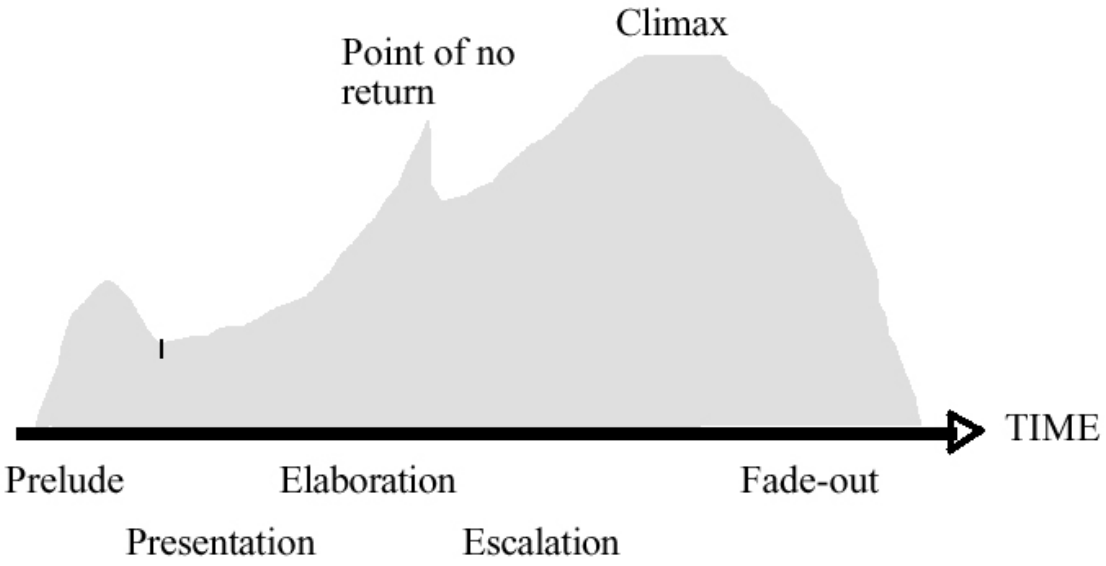


Figure T1: Hitchcock-Curve

In this Hitchcock-curve suspense gets created through time management by having a common starting point in time leading to the point of no return, then to the climax and finally fades out with a common ending point in time. This narrative structure could get destroyed through following interactive scenario: if there would be no time management, for example in an interactive film for DVD, the consumer could surf endlessly in different video clips missing any story line or climax of the story. In another destructive scenario one could imagine a passive consumer, who would watch one video clip and then be stuck because he wouldn't interact and choose another clip.

Due to the fact that we are in MECITV restricted to TV broadcasting, time management is crucial. In iTV the time frame is fixed, it is not changeable like in a video game. The broadcast is time driven, without a pause like black out or frozen image and once the broadcasting is over there is no return to the video (only if in the future there will be mhp set top boxes with extra storage space to record the videos). By nature a broadcasted program has a common start and ending point of time.

One dramaturgical principle can be stated for iTV: **Time management is necessary.**

One possibility to use time management for iTV could be following model: The author can use the classical dramaturgical principles (for example the Hitchcock -curve) of film in order to create the main story. Then the author can use the same dramaturgical principles for the sub stories, which are thematic related to the main story and run parallel on a timeframe defined by the broadcast. The author creates thematic links (same object, person, place) between the parallel videos, with which the consumer can switch between the videos according to his desires. At a special point in time the author can lead all videos (by linking them together) to a common climax and afterwards the videos fade out with the same or different endings. There shall be a common start (thematic, time based), a common climax and a common time based end, but not necessarily a common thematic end. Below one can see a figure demonstrating this model:

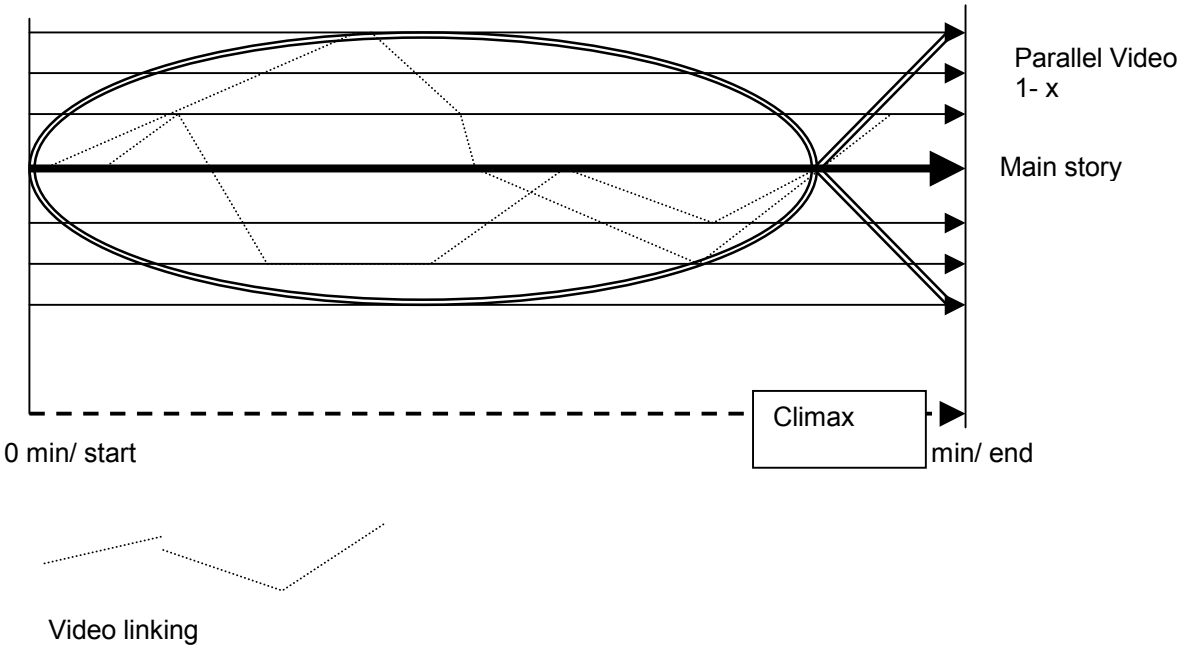


Figure T2: Time based non-linear story

The navigation in the above time based non-linear story model is limited by technical restraints today. As stated before only a set-top box with extra storage space would allow the consumer to start and stop the video story. In this case navigation would be possible in all direction, as you can see in the figure below. This would mean, navigation in the directions forward, backward, diagonal, up and down would be possible. But such set top boxes for mhp don't exist yet on the market.

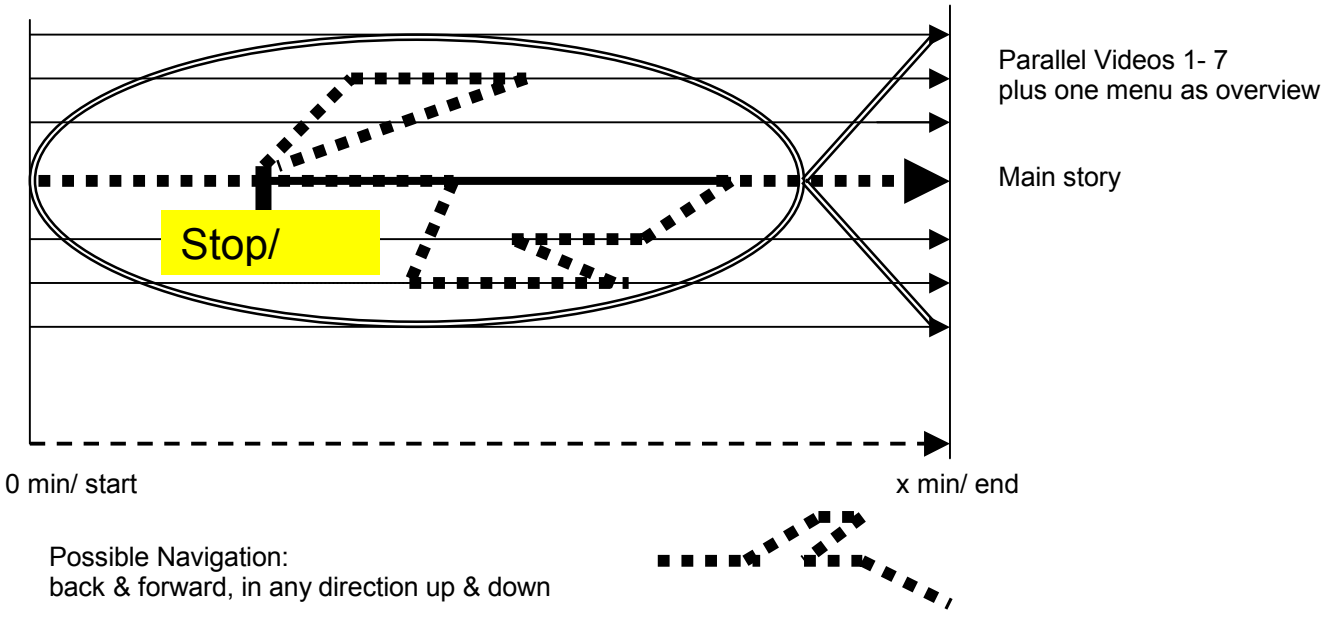


Figure T3: Time based non-linear story with free Navigation

If there is no extra storage space in the mhp Set Top Box as it is the case today, than only following navigation is possible: straight up, straight down and forward, which can be seen in the following figure: .

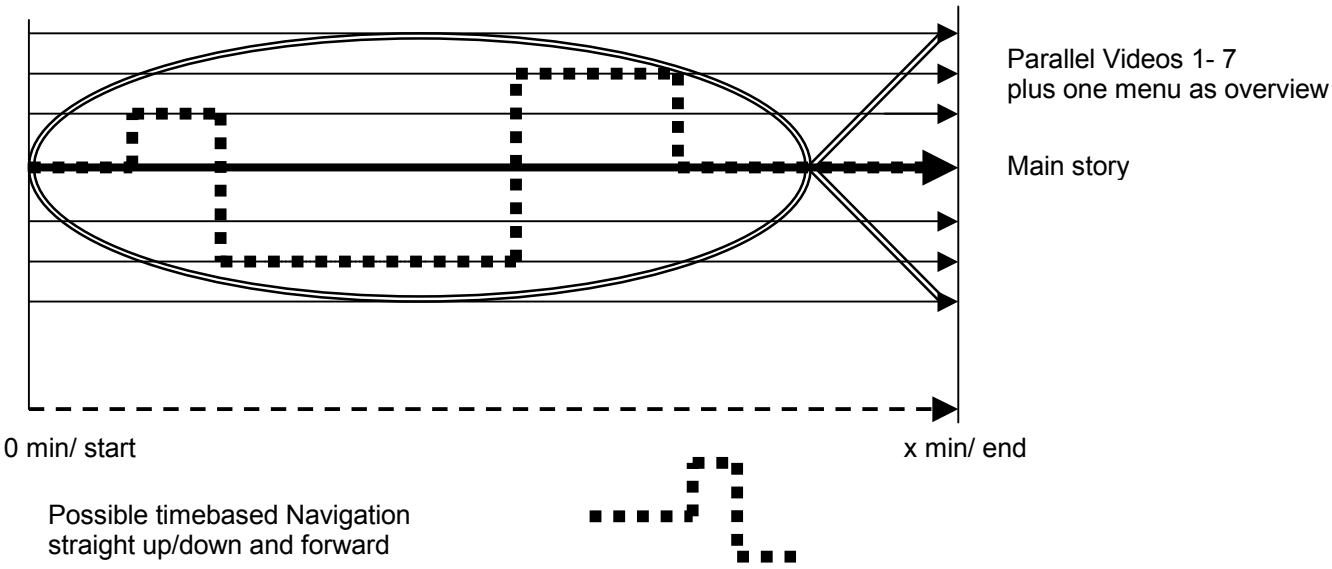


Figure T4: Time based non-linear story with restricted Navigation

These restrictions of navigation mean that the consumer will never be able to watch all the video sources of the interactive story, he will always miss something in some point of time. Therefore the content of the different videos should to be thematic related, so the consumer stays in a story framework even if he switches between video sources. Which leads to the conclusion that time based navigation is crucial. The author has to create time based choices of interaction, so the consumer experiences a meaningful story for himself.

4.2.2 Option of Immersion

A second dramaturgical principle for iTV can be stated: **The option of immersion for the consumer is crucial.**

If the consumer is not immersed into the story, he may just switch off or zap to another program.The author can create the option of immersion by creating a good TV story framework, with many alternatives to recombine video sources, which grasps the consumers attention, interest and emotion. The option of immersion can get destroyed by disturbing logical text questions and colorful buttons, freezing images, dead ends, which force the consumer to break his immersion into the content in order make rational/irrational decisions. As soon the consumer looses the thread or interest in the story, he may switch off.

One way to not disturb the immersion of the consumer is the following suggestion: Navigation is driven by the content. The actor in the film offers the consumer to follow him. The DJ seduces the consumer to follow him through a door into a night club, if the consumer clicks with his remote control o.k., else the film continues with a next feature about a businessman. At a special point of time, the business man asks the consumer to follow into his company by clicking o.k.,. If the consumer stays passive, the consumer watches a next feature about a Roma and so on. The following figure illustrates this example

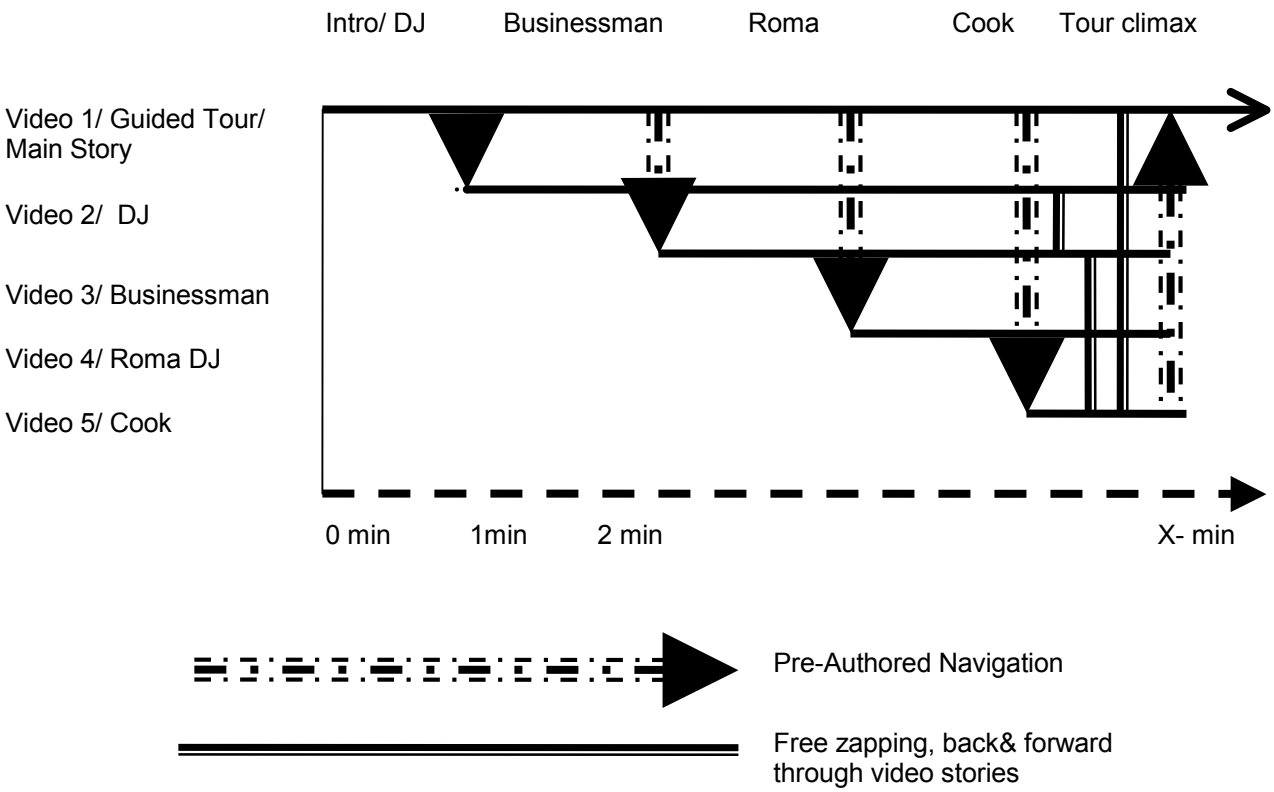


Figure T5: Content driven Navigation

In this example the possibilities for interaction are content driven. The choices of navigation are given to the consumer by the moderator, actors or interviewed person of the running film or show. To react to another human is natural and intuitive. It is also comprehensible for a consumer to press a button or to perform any other simple action if being told so in an easy understandable manner by another person. If the consumer doesn't like his own choice, he shall be always able to cancel/reverse it by clicking on his remote control the back button or by zapping back into the last or next video channel. Also doing nothing doesn't get punished, rather the consumer watches a well created TV story in a linear way.

The conclusion is that the dramaturgical principles of iTV Stories, such as time management and the option of immersion of the consumer, can be best served by time based navigation, which is content driven. The challenge of creating iTV Stories will be the art to create narrative structures, which are more complex in order to allow more information, variations and deepness in the story, but which still allow the consumer to have the personal experience of an exiting story line(s), climax(s) and a satisfying ending independent of his individual navigation.

These time based non-linear story models described above can be seen as a mixture of following structures shown in the second chapter: figure 5: "Branching with Bottlenecking or Foldback Structure" and figure 6: "Parallel Streaming Structure". As said before, both structures are suitable for interactive movies where interactors can make substantially different experiences while a control of the runtime is still possible. The authors in MECITV, while creating their interactive prototype film, will test the different variations on these two narrative structures and hope to find more dramaturgical principles for iTV during this process. It will be especially interesting and difficult to find sensible ways to lead the consumer on time back to a common storyline after branching out in different directions. So this research on dramaturgical principle will be an ongoing process during MECITV and we hope to add more interesting conclusions to this paper after having developed our first prototype.

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6 Glossary

Terms used within MECiTV project - sorted alphabetically

A

Author	person mainly considered with creating, compiling and editing content. Main focused group within MECiTV

C

Consumer	person sitting with a Set Top Box in front of a television set using iTV.
Clip	a single piece of video used in the authoring software

I

Interactor	user of an interactive system

J

Journalist	journalist relates to the Author level 2 of Draft D2.1

L

Linear	of, relating to, or based or depending on sequential development

N

Narration	sequence of events presented to a user, e.g. telling
Non-Linear	not linear

P

Plot	structure of interrelated actions or events, consciously selected and arranged by an author

S

Story	account of incidents or events

