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D8f

**Mid-term report on communication
& persuasion exemplar progress**

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Table of Contents

Introduction.....	4
Traditional concepts for a promotion campaign.....	5
Definitions	5
How to build a promotion campaign.....	8
State of the art in electronic advertisement	13
Toward a campaign based on HUMAINE technologies	15
Introduction.....	15
WP8 components of a future campaign	16
Research advancements in the last year	28

Introduction

Workpackage 8 aims at helping understand some of the critical issues for building persuasive, or otherwise emotion-inducing computational, systems and at testing limited realizations that can be demonstrated as proofs of concepts for a novel class of systems.

WP8 exemplar role is to demonstrate some practical potential of the area, and to define an overall scenario for anchoring activities to a concrete challenge, and to define methodologies for evaluation.

To this end we propose the design of a promotion campaign framework, for concepts of social value, to be potentially realised with a number of different technologies which are the object of current research within HUMAINE WP 8.

The idea is to start from the classical design of a promotion campaign and to see how the different technologies we are developing can impact on its design and application., then to have a short review of the state of the art in electronic advertisement. In the following we evaluate how technologies partially developed in WP8, when fully realised, have a potential impact in future innovative promotion campaigns.

A final section brings an update about research advancements in WP 8 since the previous deliverable.

Traditional concepts for a promotion campaign

Definitions

A **promotional campaign** is the coordinated series of promotional efforts built around a single theme and designed to achieve a specific objective. The combination of these efforts can involve various activities used by the marketer over a period of time to achieve predetermined goals.

Promotion is one of the four aspects of marketing (the other three parts of the marketing mix are product management, pricing, and distribution). Promotion generally involves disseminating information about a product, product line, brand, or company.

Still, even if we will refer to the general framework of a promotion campaign, we will focus on the specific promotion campaigns that aim at fostering concepts of social value (sometimes called **no-profit campaigns**). Even if the meant concept of social value can be seen as a “product” to be advertised, the methodologies and the focus of these campaigns are slightly different.

Promotion comprises several subcategories (the various activities undertaken in view of the specific objective, see Picture 1):

- Advertising
- Personal selling
- Sales promotion
- Publicity and public relations

The specification of these variables creates a promotional mix or promotional plan. A promotional mix specifies how much attention to pay to each of the four subcategories, and how much money to budget for each. A promotional plan can have a wide range of objectives, including: sales increases, new product acceptance, creation of brand equity, positioning, competitive retaliations, or creation of a corporate image. As secondary needs: offering recognition, self-respect, achievements, or self-realisation.

Advertising: Any paid form of non-personal presentation and promotion of ideas, goods, or services by an identified sponsor.

- Examples: Print ads, radio, television, billboard, direct mail, brochures and catalogs, signs, in-store displays, posters, motion pictures, Web pages, banner ads, and emails.

Personal selling: A process of helping and persuading one or more prospects to purchase a good or service or to act on any idea through the use of an oral presentation (in our scenario is *personal communication*).

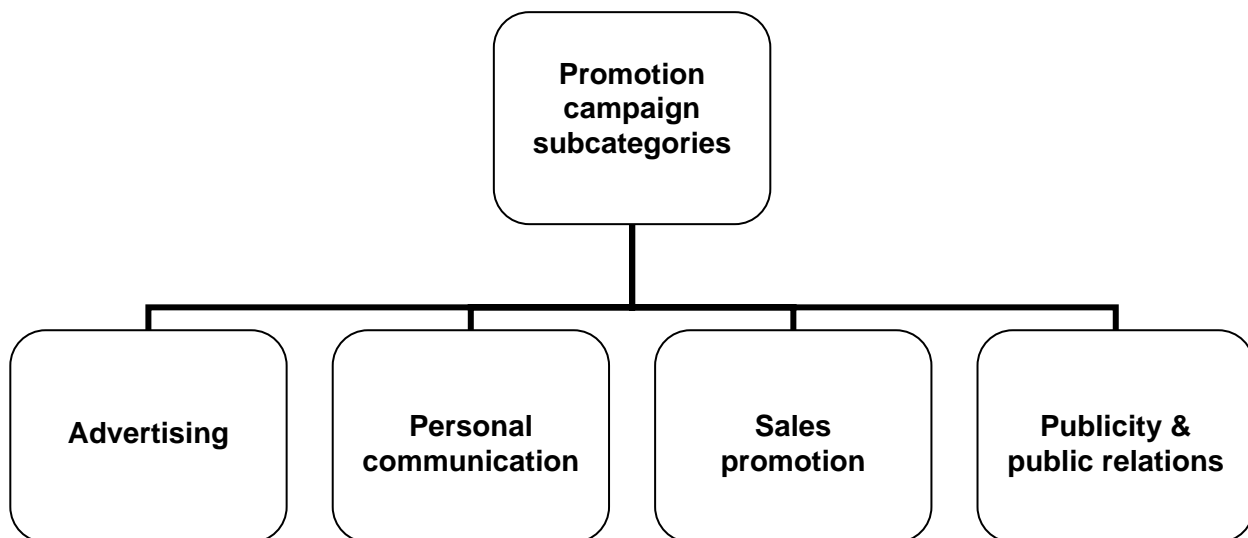
- Examples: Sales presentations, sales meetings, sales training and incentive programs for intermediary salespeople, samples, and telemarketing. Can be face-to-face or via telephone.

Sales promotion: Incentives designed to stimulate the purchase or sale of a product, usually in the short term (in our scenario are specific advantages offered in connection to the performance of behaviour in line with the *social value*).

- Examples: Coupons, sweepstakes, contests, product samples, rebates, tie-ins, self-liquidating premiums, trade shows, trade-ins, and exhibitions.

Public relations: Non-paid non-personal stimulation of demand for a product, service, or business unit by planting significant news about it or a favourable presentation of it in the media.

- Examples: Newspaper and magazine articles/reports, TV and radio presentations, Charitable contributions, speeches, issue advertising, and seminars.



Picture 1 – The subcategories of a promotion campaign

How to build a promotion campaign

Preamble: Is it a *Strategic* or a *Tactic* Campaign? Strategic campaigns seek to obtain an immediate goal, while Tactic ones are long term oriented.

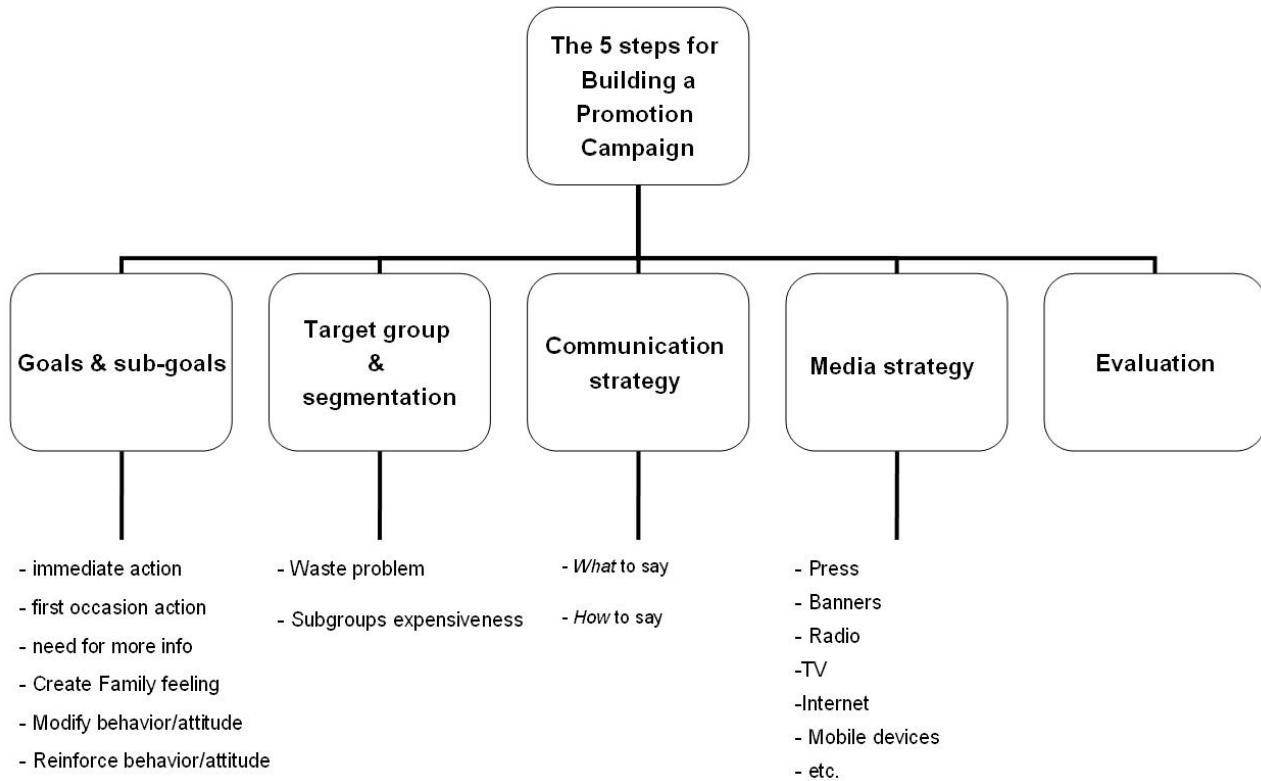
Depending on the campaign typology the used persuasive system can vary to fit the goal (see also point 1 below).

Preamble: Is it a *Local* or a *Global* Campaign? Local campaigns are studied and built autonomously in a country to meet its (cultural) characteristics, while global ones are uniform in every country.

Given this preamble we can now analyze the five main steps (see Picture 2) in the building of a promotion campaign:

- 1) **Define the goals** (and possibly the sub-goals) of your campaign.
- 2) **Define the target group** (target audience) and segment it.
- 3) Define the **communication strategy**
- 4) Define the **Media strategy**
- 5) Evaluate the effect of the **promotion campaign**

The following sections are devoted to the analysis of these steps.



Picture 2 – the five steps for bulding a promotion campaign

Goals

Define precisely which are the goals (and possibly the sub-goals) of your campaign. Goals of a promotion campaign can be:

- Induce an **immediate action** (action inducement), like for example an immediate purchase, or, in the no-profit campaign scenario, immediate decrease of use of lighting and so of electricity in the house.
- Induce to **act at the first occasion** (like trying a product at the first occasion, or performing an action as soon as the conditions holds)

- induce a **need for more information** (for actions that require a long and articulated reasoning before their undertaking)
- Create **Family feeling**
- **Modify behaviour/attitude**
- **Reinforce behaviour/attitude**

Specific Goals of a no-profit campaign can be:

- Inform and make aware (about a problem)
- Modify “wrong” behaviours
- Raise money
- Promote charity work

The first point is most of the time the primary objective. Without awareness it is impossible to pursue the other objectives.

We can say that a complete and extensive promotion campaign involve all the above as sub-goals, depending on the audience and the setting of the used technology. Also the goals of the marketing plan can affect these sub-goals. Marketing plan goals can be: maintenance, expansion, innovation.

Target group

Define the target group (target audience) and segment it. This is a really complex process: to define it, it is necessary to find the motivations that can bring them toward the product. The target group can also affect/indicate which media to use.

It is important to distinguish also between the target group and the potential group. They require different methodologies.

There are two main problems with “classical” advertising:

1. there is always a “waste”: some people that are not in the target audience but still are exposed to the message (e.g. a TV advertisement for less fuel consuming cars seen by a person without the driving licence).
2. some people in the target group are “too expensive” to be reached.

Similar to the problems with information retrieval we can say that these two represent *precision* (number of targets reached divided the number of persons reached, point 1 above) and the *recall* (number of targets reached divided the total number of targets, point two above) of the promotion campaign.

Communication strategy

The **communication strategy** can be divided in

1. *what* to say
2. *how* to say.

What to say: it represent the linguistic content of the message describing the subject.

The campaign can be mono-subject or multi-subject. The mono-subject campaign uses one single message repeated over the whole period of the promotion. Multi-subject uses different messages (usually longer at the beginning of the campaign, and shorter later, just to recall the message).

How to say: This part represents the way the message is presented, like voice tone, music, colors images, etc. These are all the elements that accompany the “argumentative” part of the communication.

Media strategy

Define the **Media strategy** (on which media to show the campaign)

The campaign can be mono-media or multi-media. The mono-media campaign uses one single media to convey the message. Multi-media campaigns uses several media (news-paper, tv, etc.).

Main media are:

Press, Banners, Radio, TV, Internet, Mobile devices, etc. (new media technologies will be discussed in the last section).

Evaluation

The approach usually adopted to assess the effectiveness of a promotion campaign is a pragmatic one: the campaign is first tested on small groups and then re-implemented according to the results of the testing phase in order to be run with the general audience. The problem is that, even if tested in advance there is no direct way to assess the effectiveness of a promotion campaign. To overcome this limitation many methodologies have been refined in order to obtain indirect indications. These methodologies can be both quantitative and qualitative and usually address aspects like: memorization, attitude change, perceived source credibility, etc.

State of the art in electronic advertisement

Electronic advertisement is already an important economic element for promoting goods or services. It refers to advertising messages delivered over an electronic network with the aim of inducing a purchase that is not necessarily electronic, and it should not be confused with Electronic Commerce that refers to transactions conducted over an electronic network.

Internet appears as a fundamental medium for advertisement already now. Internet advertising was about 9.4 billion \$ (8,000 million euro) in 2004 according to Kagan Research LLC. And growth is very fast: Google advertisement revenues went from 0 to 3,400 million euro in five years according to Business Week.

Main instruments are:

1. **Email marketing** by means of Advertising email, Newsletter, Digital Coupon,
2. **Search Engine Marketing**, that refers to the two activities, done by means of search engines.
 - a. *Keyword advertising*, a methodology to advertise websites when the user makes searches with certain keywords. It usually employs the technique of *pay per performance*, which includes all the marketing activities that allow paying only for the obtained results, by means of tracking systems. An example is the pay per click by Google.
 - b. *search engine optimization*, a set of methods aimed at improving the ranking of a website in search engine listings.
3. **Promotion Marketing** by means of Banner Advertising, Rich Media, Partnership
4. **Recommendation systems** are programs which attempt to predict items (movies, music, books, news, web pages) that a user may be interested in, given some information about the user's profile (explicitly or implicitly collected).
 - a. Examples of explicit data collection: Asking a user to rate an item on a sliding scale. Asking a user to rank a collection of items from favorite to least favorite. Presenting two items to a user and asking him/her to choose the best one. Etc.

- b. Examples of implicit data collection: Observing the items that a user views in an online store. Keeping a record of the items that a user purchases online. Etc.

The recommendation system compares the collected data to similar data collected from others and calculates a list of recommended items for the user. Several commercial and non-commercial examples use this methodology, e.g. Amazon.

Toward a campaign based on HUMAINE technologies

Introduction

As stated, our aim is to design the future of promotion campaigns exploiting intelligent information technologies that include some form of emotion processing.

The future will probably include important factors in electronic promotion and advertisement:

- a) reduction in time to market and extension of possible occasions for advertisement;
- b) more attention to the wearing out of the message and for the need for planning variants and connected messages across time and space;
- c) contextual personalisation, on the basis of audience profile and perhaps information about the situation, both cognitive and positional;
- d) larger role for multimodal messages;
- e) possible interactivity.

Leaving alone questions of privacy, as far as this document is concerned (but of course advertisement and promotion can be for a good cause and for social values!), all factors call for a strong role for computer-based intelligent technology for producing novel appropriate and effective promotional communication.

In the following we review the contribution that specific components being studied (and at different level of prototype development) can offer in a future campaign.

Please note that we are considering *general* aspects of a promotion campaign. Given the high costs involved in moving to different domains, each partner keeps experimenting with the scenario it has worked with so far.

WP8 components of a future campaign

Itc-Irst:

1) Individual-oriented persuasive message generator

A prototype we are developing is called *Promoter* and is designed for multimodal message generation. The message is generated and tailored (to maximize its impact) according to the cognitive state of the receiver, his/her social relations, his/her emotional state, the context in which the interaction takes place. In generating the message, *Promoter*:

1. reasons on the effectiveness of the message, as well as on the high-level goals.
2. uses persuasion mechanisms imported from various fields
3. merges persuasive strategies into a coherent framework to be used for multimodal message generation.

It is designed for monodirectional communication and, given that it can produce tailored messages, it can be used for communication to an individual or to a homogeneous group. It can be used for advertising on the internet, on a stand alone computer with different multimodal realisers (ECA and Kinetic Typography), or it can also produce paper-based output. *Promoter* is suitable for mobile (PDA, mobile phones) context-aware devices that can produce messages at the proper location and situation, reducing the “waste problem” and “subgroup expensiveness”.

To be effective *Promoter* needs to be combined with a system that gets a model of the audience, including its current state. In general the use of such a complex system makes sense in those situations requiring flexible messages tuned to the specific audience. The main component of *Promoter*, the persuasion strategy engine, is language-independent and most strategies are domain independent, so that in principle it is scalable and portable.

Goals	Target group	Communic. strategy	Media strategy
- immediate action	- Waste problem	- <i>What</i> to say	- Internet
- first occasion action	- Subgroups expensiveness	- <i>How</i> to say	- Mobile devices

2) Tool for producing humorous advertisement messages

Another prototype we are developing is a *tool for producing novel humorous expressions*. From an application point of view we think the world of advertisement has a great potential for the adoption of computational humor. As things are now, humanly produced humor appears widely used in advertisement. Data confirm humor as a fundamental tool. In the UK, advertisements are based on humor in 33% of all cases and in 93% of those cases that show pertinence, according to a 1998 survey. It has shown that perception of humor in promotional messages produce higher attention and in general a better recall than non humorous advertisement of the product category, of the specific brand and of the advertisement itself.

Our tool is meant to be used as an aiding tool in the creative process of copywriters, suggesting humorous expressions to be selected by the human agent. The result can be used for monodirectional mass communication. It can be used for advertising on the internet and if combined with an ECA or Kinetic Typography it can provide a dynamic element to stress graphically the emotional content of the message.

The tool for humorous expressions is particularly suitable for producing a high rate of potential messages, which can be targeted to specific groups, or novel situations where a rapid intervention can be useful. One specific potential case is the humorous variation on headlines, as a tool for semiautomatic but immediate production of an advertising message as a reaction to an event.

In the future a target model and a context model can allow having humorous advertisement targeted to the individual (or subgroup) taste and possible making reference to the individual (subgroup) interests and situation.

Goals	Target group	Communic. strategy	Media strategy
<ul style="list-style-type: none"> - immediate action - first occasion action 		<ul style="list-style-type: none"> - <i>What to say</i> 	<ul style="list-style-type: none"> - Press - Banners - Radio - Internet

ISTC-Roma:

- 3) This work is mainly theoretical aiming at enriching our model of persuasion strategies by (a) further examining the differences between emotional and non-emotional strategies, and (b) accounting for the possible mingling and intertwining of emotional and non-emotional strategies, even within the same persuasive attempt towards the same target. Our domain of reference will be healthy eating, in which a differentiated corpus of examples can be found, ranging from advertising to messages produced by scientific agencies delegated to the promotion of a correct behaviour in this domain.

The goals of a promotion campaign which most fit our approach are those of *modifying or reinforcing the target's attitudes* and behavior. Attitudes are in fact complex constructs composed of predispositions to certain actions, a set of beliefs and judgments, and emotional states associated with, or aroused by, the object of the attitude. Modifying an attitude therefore implies modifying its three components. Not surprisingly, in various domains persuasion actually appeals to both the informational and the emotional sides.

In particular we are interested in investigating – in collaboration with Univ. of Bari – how an emotional persuasive strategy par excellence, such as *persuasion through arousal of emotions* (Miceli, de Rosis, & Poggi, in press), can include argumentative components, and how the latter can be functional in arousing some emotion and, as a consequence of this arousal, to inducing some intention (and behavior) in the target.

To this purpose, the “*what to say*” (and “*what not to say*”) side of the communication strategy is particularly relevant. In fact, we view persuasion through arousal of emotions as one of the exemplary cases in which so-called “enthymemes” take the lion’s share. An enthymeme is generally defined as an argument that has one or more non explicit assumptions (missing premises or conclusion), and the alleged reason why those assumptions are not explicitly stated is that they are presumed to be part of the interlocutors’ “common knowledge”. However, another important reason why some assumptions are left implicit can be of the strategic type: the persuader may in fact suppose that, if he/she were to explicitly state such assumptions, the target would question or reject them. Much advertising, as well as a considerable part of political argumentation, is presented in the form of enthymemes for this purpose.

We wish to show that enthymemes play a substantial role in persuasion through arousal of emotions precisely because here some of the elements of the persuader’s reasoning process are not only likely to be omitted, but *must* be omitted from the argumentation message, to avoid the failure of the persuasion attempt.

We are also interested in investigating the persuasive use of irony, humour, and allusion in advertising. Some examples taken from TV ads are analyzed in terms of their underlying communicative goals, the inferences they trigger, and their persuasive import. On this basis, some general rules will be extracted for the generation of persuasive, humorous, and allusive messages.

Univ. of Bari:

- 4) We are working on *a computational model of context and user-tailored persuasion* which elaborates on the theories developed at ISTC and by other psycholinguistics, and on which a prototype dialog simulator (that we called *PORTIA*) is being built.

The model considers, in particular, the role played by uncertainty in reasoning about the mental state of the persuadees (their personality, values and beliefs), and in defining a ‘strength’ for the alternative persuasion strategies available in a given context.

It then reflects on the difference between this reasoning phase and the translation of the selected strategy into an argumentation scheme and plan. In this step, it considers how classical argumentation schemes (à la Walton, Reed et al.) should be revised when emotions are introduced in the persuasion process and how an argumentation scheme may be rendered in terms of a discourse plan.

Once a plan has been built, the model considers how the persuader’s mental state influences the way it may be rendered (information order and complexity). Surface generation of the revised plan is finally adapted to the persuadee and to the media in which the message will be produced: natural language or ECA on a pc (private context of use), or ECA displayed on a kiosk or a wall (public context of use). The possibility of integrating the ECA into a virtual world is being investigated, to assess the increased value of combining natural language communication with images.

In *PORTIA*’s KB, knowledge about persuasion strategies and their strength is integrated with knowledge about how to argue on their premises: this knowledge base may therefore be employed not only to select the first (and most promising) persuasion step, but also to repair possible failures and to strengthen or activate the persuadee’s goals and beliefs when needed.

Although the method developed is domain-independent, the application domain to which it will be applied is that of *a persuasion campaign aimed at influencing and changing behavior about healthy eating*. To ground the methods developed on ‘real’ data, a corpus of persuasion messages was collected and the comparative strength of alternative strategies was evaluated.

Goals	Target group	Communic. strategy	Media strategy
<ul style="list-style-type: none"> - Respond to the need for more information - Modify attitude or behaviour - Reinforce attitude or behaviour 	<ul style="list-style-type: none"> - Campaigns promoted by health care services in favour of individuals or groups of people with eating disorders 	<ul style="list-style-type: none"> - <i>What</i> to say - <i>How</i> to say it - <i>How</i> to respond to objections 	<ul style="list-style-type: none"> - Internet - Pervasive computing

Queen’s University of Belfast:

5) The first prototype we are developing aims at *selecting the appropriate music to accompany a persuasive message*. Given that it can produce tailored music, it can be used for personal and homogeneous groups communication. It can be embedded both on fixed and portable devices. It can be used for advertising on the internet.

This prototype is particularly suitable for the communication strategy step of a promotion campaign on the “*how to say*” side. In fact it is well known that in TV ads one of the key aspects is the selection of a suitable melody/jingle to enhance the persuasive impact of the message.

Goals	Target group	Communic. strategy	Media strategy
		<ul style="list-style-type: none"> - <i>How</i> to say (++) 	<ul style="list-style-type: none"> - Internet - Mobile devices

6) Additions to a Communicator dialogue model. Spoken dialogue systems, in order to compensate for imperfect speech recognition, typically implement one of several confirmation strategies. In a system that predominantly uses one confirmation strategy – e.g. an implicit confirmation in which the system echoes back to the user what he/she has just said, before asking its next question – a repetitive formulation of the confirmation phrase is likely to become wearisome for the user. Simple variation of the opening elements of the confirmation phrase, or suppression of the confirmation phrase when it is deemed unnecessary, adds variety and naturalness to the dialogue and makes the system a more appealing dialogue partner. When the formulation is linked to the system’s mood – itself intended to converge with that of the user (upbeat when the interaction is productive – more reserved or uncertain when progress is difficult), the system adopts a ‘personality’ that further increases naturalness of the interaction. Moreover, for a frame-filling application, where the system requires certain information in order to complete a transaction or section of a transaction, the system can adopt a progressively more closely constraining or insistent tone as the user repeatedly fails to provide the requested information. Depending on the chosen

system 'ethos', the system's persuasive utterances can be formulated in such a way as to range from polite encouragement to a (veiled) warning that the transaction is about to fail.

Goals	Target group	Communic. strategy	Media strategy
- need for more info - Modify behaviour attitude - Reinforce behaviour attitude		- <i>What to say</i> - <i>How to say</i>	- Internet

University of Paris 8:

- 7) The framework we are developing is called *Gaze and eyes for persuasion*. It is an interpretation module based primarily on the perceptual input of the listener's gaze. We will also consider reactive and cognitive backchannels through attention and interest, as signalled through the gaze behaviour of a virtual listener, in order to define a speaker that alters its own gaze behaviours during discourse for the purposes of persuasion.

This framework is particularly suitable for intervention in the "how to say" aspect of the communication strategy. Nonverbal communication for keeping the attention of the receiver is a key aspect for a successful persuasive communication. It is meant to enhance the impact of ECA's in dialogic but also in monological settings (for instance an agent giving a recommendation to a group that observes those that are not paying attention).

This framework is particularly suited to examine the level of interest the listener is paying to the conversation. Through the evaluation of this level of interest, the speaker can perceive the effectiveness of the conversation and decide if it is high enough to maintain the interaction with the listener or if he should close it. Regarding the assessment of the listener's attention, we focus above all on gaze. Gaze is an especially important way of providing feedback and subtle signalling. Through it a listener can show his level of interest and engagement.

The speaker can be helped in maintaining the interaction and making it effective by the listener's backchannel: the signals produced by the listener to make the speaker aware if he is really paying attention, listening to, understanding and agreeing with what is being said.

Goals	Target group	Communic. strategy	Media strategy
Detect/maintain interest		- <i>How to say</i> (++)	- Internet - Mobile devices

University of Augsburg:

8) We are developing a prototype for an *Integrated Model of emotion and politeness*. Starting from an operationalization of Brown and Levinson's politeness theory our prototype integrates a dimensional model of emotions into the selection mechanism of appropriate politeness strategies. This prototype is particularly suitable for the **communication strategy** step of a promotion campaign both on the “*what to say*” and “*how to say*” side but mainly focuses on the “*how to say*” part.

The dimensional model of emotions can be applied on two different levels in this prototype. It can either influence the selection process by modelling the emotional state of the speaker, thus resulting e.g. in the use of a rather impolite utterance due to the subjectively felt anger of the speaker. Or, which is more appropriate in the context of the promotional campaign, the addressee’s emotional state is taken into account during the selection process resulting in a specially tailored utterance which will have the maximal effect on the addressee.

Because the prototype is based on Brown and Levinson’s politeness theory, it takes a number of contextual variables into account like social and power distance between the interlocutors which make it especially useful for a promotional campaign. Interacting with someone of high social power can thus result in a more respectful address. Because the knowledge about the correct use of politeness strategies is mutually shared, this context-dependence can be exploited for a promotion campaign. E.g., if the context information about social distance is deliberately increased, this will result in the above mentioned more respectful address and the addressee might thus feel treated “like a king”.

Goals	Target group	Communic. strategy	Media strategy
		- <i>What to say</i> (++) - <i>How to say</i> (++)	

- 9) The second part of our work could play a role in a novel way to look at advertisement. Work on *Emotions and Lies* experimented with in the Gamble system could be at the basis of a novel component. We develop strategies to decide on (i) when to convey the felt emotion (ii) when to convey a false emotion, and (iii) when to let the original emotion leak through to allow the the user to interpret the agent's behaviour appropriately.

This of course does not mean to deliberately deceive the user but to appropriately react to his/her expectations. Imagine a tutoring scenario where the user tries over and over again to solve a certain problem. Assuming an appropriate emotional model, the agent should get bored or feel anger. But it would not be very helpful to display this emotional state to the user. Instead, the agent should come up with a strategy of helping the user and perhaps cheering him up. On the other hand, the use of irony could be assisted by dynamically faking an emotion and letting the original emotion leak through. Thus, an utterance like “That really was great!” could be interpreted other than literal. This would open up totally new ways of designing the interactions with embodied conversational agents.

Heriot-Watt University:

- 8) We propose a *design for a mobile persuasive storytelling guide* attracting people to visit a new or renewed cultural site. The guide would be a virtual guide in a virtual heritage on the web that can be accessed anywhere around the world. It can also be broadcast through the large screen in front or along the corridor of the site, appearing when visitors approach or leave the screen, on television for advertising purposes or on PDA.

Description about a particular heritage site provides a very useful way of conveying the quality of the site but most visitors are not motivated by the simple facts. More interesting features need to be included in campaigns of heritage sites. Therefore, we are proposing a new approach, that is, communication of the heritage through the use of an emblem.

The guide agent will possess a personality that reflects its role in a particular ancient myth or historical event. The employment of such well-known character can be an attracting factor that gives a chance to the foreigners to learn more about the respective nation. This character can convey both the concept and reality of a particular subject. It can help to impart the relevant knowledge to all generations, both young and old.

It is a design for mono-directional communication and given that it personalizes the stories presentation, it can be used for personal and homogeneous groups' communication. The design is particularly suitable for those goals of a promotion campaign to induce 'need for more information', 'behavior/attitude modification' and behavior/attitude reinforcing' since the stories

contain the guide’s perspectives, experiences and beliefs. It is also designed to inform and make aware, hence increase the appreciation of a cultural heritage.

The guide attempts to persuade the visitor to look at a particular subject or event from its own point of view and experiences, challenging or changing his/her existing beliefs and structuring his/her mental picture of the natural world. To be effective, the guide will need an interest model of the visitor, including his/her liking/disliking and agreement/disagreement to the stories presented. It will then tune its presentation accordingly to the feedback.

Goals	Target group	Communic. strategy	Media strategy
<ul style="list-style-type: none"> - need for more info - Modify behaviour attitude - Reinforce behaviour attitude - Inform and make aware 	<ul style="list-style-type: none"> - Public - Foreigners 	<ul style="list-style-type: none"> - <i>What to say</i> 	<ul style="list-style-type: none"> - Internet - Mobile devices - Television

Cantoche:

9) The recent dramatic increase of online e-administration procedures and services is the guarantee that, finally, the Public Services have decided to strongly invest in the NTIC and specifically e-services for the benefit of its users. As a key innovating public actor in the field of technologies, the city of Issy-les-Moulineaux (close to Paris, France) has confirmed its leadership while it organizes in December 2005 the very first 100% online election for the renewal its “conseils de quartiers”. So as to promote and explain this election and the online procedure, the city has hired a virtual citizen, Sam, who is in charge of the (viral) communication surrounding the project.

Sam is a cartoonish style character in order to break the austere image of the politicians and to create a friendly relationship with the user. Sam is powered by the Living Actor™ technology. Cantoche built a web based application where Sam is acting by playing different scenarios depending of the user’s choice.

The 3 missions for Sam are:



- **Information:** Answer general questions that a citizen can have regarding the local life. (The choice is large because the citizen has a variety of needs.)
- **Persuasion:** Help the visitor to vote on-line showing how it's easy and quick. The user doesn't have to move. This new way is innovative thanks to the new technologies!
- **Motivation:** Help the visitor to be a real citizen by inviting other people to go to vote on-line. The visitor can "send" by mail Sam with the scenario of his choice to a friend. This is viral campaign

Goals	Target group	Communic. strategy	Media strategy
		- <i>What to say</i> - <i>How to say</i>	Internet

Evaluation

Activity will be conducted for evaluating the role of some novel components of the campaign.

Cantoche

- 1) For *evaluation of persuasive systems* we suggest evaluating a system based on an existing application using an ECA to persuade people to vote on line. With the help of other participants of the WP8, we would like to test different kind of scenarios (using or expressing several emotions) to promote elections. After persuading the user to vote on line, the user has the possibility to choose a scenario and to send this scenario to a friend to invite him to go to vote.

This work is particularly suitable for the **evaluation** step of a promotion campaign.

Haifa university:

- 2) The effectiveness of persuasive systems needs to be evaluated. Our approach in evaluating these models is to apply research methodologies developed in studies of persuasion in social psychology.

Below we delineate the guiding assumptions of our proposed approach for evaluation:

Evaluation – guiding assumptions

1. The scope of WP8 is to design persuasion agents or at least lay the foundation for such a design
2. The design of persuasion agents should be guided by relevant theoretical frameworks and research findings. One such framework is that suggested by the ELM model (Elaboration Likelihood Model; Petty & Cacioppo, 1986).
3. The persuasion agents should accomplish their function, i.e., be persuasive and do so via the means that were planned for it to use. For example, if it was designed to utilize an appeal to the emotions of the audience, an evaluation needs to assess not only the extent to which the target audience was persuaded but also the extent to which the change in attitude was achieved via a change in one's emotions caused by the system.
4. The purpose of the application should comply with ethical considerations and part of the evaluation should be dedicated to the examination that it was indeed the case.
5. Applications should be functional across cultures. That is, system should be evaluated in a few different cultures so to make sure that the utility of the system is not culture specific.

Accordingly, the following issues need to be evaluated

A-priory

1. Does the goal of the application comply with ethical and lawful considerations?
 - What does the law say in respect to the issues under question?
 - What do the relevant ethical guidelines suggest?
 - Sensitivity to cultural diversity in ethical considerations and laws in different countries in which the system applied and tested.

What else should be evaluated?

2. Are the means (psychological) by which persuasion is planned to be achieved functional? This will be assessed using literature reviews and using preliminary experiments if information is missing. Likewise, one may need supplementary studies assessing cultural aspects not considered by existing data

A-Posteriori

1. How effective is the application? Controlled experiments will assess the effectiveness of the system and the psychological constructs that are involved (e.g., audience emotions, attitudes etc.). These will assess: level of persuasion achieved. That is, to what extent a “change of mind” was achieved? To what extent the “change of mind” achieved matches a similar attempt made by a real human agent? How effective is the application in different cultures? Effectiveness (i.e., level of persuasion) should be assessed on multiple levels including cognitive (e.g.,

memory) emotional (attitude) and behaviour (i.e., actual visit to the museum if the advertisement's goal is to promote such visits). Overall, this approach of evaluation captures important aspects of HCI assessed at multiple potential levels of influence. This work is particularly suitable for the evaluation step of a promotion campaign. Specific methodologies for evaluating persuasiveness of systems are still missing.

2. **How** the “change of mind” was achieved? To what extent any “change of mind” achieved is based on the planned means for persuasion?
3. To what extent the application complies with the planned ethical guidelines?

Evaluation model within HUMAINE

- Evaluation must be a synchronized joint effort that will join together groups that plan applications and groups that can plan evaluation studies.
- Planning of application must consider evaluation issues already at the start of the planning

Research advancements in the last year

Irc-Irst

For *Persuasion models* we have increased the number of persuasive strategies covered by our model. In particular we have investigated in more depth the use of promises/threats and their possible relation to a promotion campaign. This has led to the publication of three papers:

For *Persuasive systems* we have continued the development of the *Promoter* prototype and experimented, among other things, realizations with different output modalities (e.g. Kinetic Typography) to test emotion expression realization alternatives.

For *Evaluation of Persuasive systems*, the work done in collaboration with Haifa University brought to the running of a pivotal experiment on the validity of the fitting principle (coherence between verbal message and displayed emotions) used by the *Promoter* prototype.

The analysis of the result has also given insights on how to run/modify a larger evaluation experiment. The product of this work will be a working framework for evaluation studies of automated persuasion systems.

For *Ethics and social influence* a joint activity with Manchester University brought to a broader and deeper model of ethically aware persuasive agents and to a proposal of Ethical Guidelines for systems developers.

For *computational treatment of affective content in natural language* various resources have been further developed. WordNet-Affect has been refined, and the possibility of enriching it with the polarity dimension and causative/stative tagging has been explored.

As far as the affective weight of a "generic term" is concerned, an affective similarity measure has been developed. The functionality of this measure is acquired in an unsupervised manner through the analysis of large corpora (such as for example the British National Corpus). We have started to work toward the coupling of affective valence recognition in text with kinetic typography rendering, so to express the emotional aspect perceptually.

For *computational humor* we started to explore the automatic recognition of humor content in short sentences such as one-liners, slogans and headlines. A one-liner is a short sentence with comic effects and an interesting linguistic structure: simple syntax, deliberate use of rhetoric devices. First experiments have been encouraging. We have investigated whether automatic classification techniques based on machine learning, are a viable approach to distinguish between humorous and non-humorous short sentences, with some good results.

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ISTC-Roma

In the endeavor to model persuasive strategies and account for the possible interaction of emotional and non emotional components in the same strategy, we are investigating – in collaboration with Univ. of Bari – how an emotional persuasive strategy par excellence, such as *persuasion through arousal of emotions* (Miceli, de Rosis, & Poggi, in press), can include argumentative components.

We suppose that persuasion through arousal of some emotional states implies at least four steps:

- (a) *reasoning on the receiver's mental state*, to single out the presumably most effective strategy, given the receiver's characteristics (their personality, and therefore their presumed goals and values) and their specific goals and beliefs which are currently active (also due to contextual aspects);
- (b) translating the selected strategy into the *instantiation of an appropriate argumentation schema*: this may in turn imply two sub-steps: on the one hand, instantiating the schema for arousing a specific emotion, and, on the other, instantiating the schema for appealing to the aroused emotion in order to make it generate a certain goal;
- (c) translating the schema into a *context-dependent message plan*;
- (d) translating the plan into a natural language message, through an appropriate surface natural language generation step.

We are investigating how the four mentioned steps may be formalized and implemented. In particular, we focus on a subset of emotions (to be aroused through persuasion): those stemming from sense of inferiority, such as emulation and envy. This investigation of course presupposes a model of the cognitive ingredients of such emotions (Miceli & Castelfranchi, in press), and of their possible interrelations. This model may be seen not only as a representation of the cognitive processes which elicit the emotions of envy and emulation, but also as a second-order model: a persuader's theory of the persuadee's mind, on which the persuader may reason in order to first select the most appropriate strategy of persuasion, and then apply some argumentation schema aimed at arousing in the persuadee the emotion which is most likely to generate, in turn, a certain goal.

Because not all the ingredients of the reasoning process followed by the persuader are likely to be included in the argumentation message, this implies addressing the problem of *enthymemes* in argumentation, that is of those propositions (either premises or conclusions) which are omitted, or not explicitly stated, in an argument. We in fact assume that some propositions are left implicit for strategic purposes, in that the persuader supposes that the target might question or reject them.

University of Bari:

In the scope of our research on a dialog-based promotional campaign in the domain of healthy eating, we worked in two main directions: *formalisms to represent strategic reasoning in persuasion* and *translation of persuasion strategies into a natural language message or dialog turn*.

For *formalisms to represent strategic reasoning in persuasion*, in particular we have:

- (a) studied how the persuader may integrate her hypotheses about the characteristics of the persuadee into a consistent model of his mind which considers the possible sources of uncertainty, by representing and propagating information ('evidence') collected during dialog interaction;

(b) defined a formalism to represent emotional and non emotional persuasion strategies so as to enable combining knowledge about the persuadee with knowledge about available strategies in a given context, to select the most promising strategy;

(c) defined a communication language between the two participants to a persuasion dialog, which defines the 'types of moves' that every participant is enabled to perform. We studied how to integrate, in the formalism mentioned under b., knowledge required to respond to various types of reactions to a persuasion attempt by the persuadee: requests of information, rebuttals, exceptions, objections, provision of new information, and others.

To keep the time complexity of the reasoning process within a reasonable limit, we defined a method for assembling dynamically 'information chunks' into *a reasoning model* in which only the selected candidate strategies and the information that supported their choice are represented, by labelling them with the annotation of possible success or failure emerged during the dialog.

The strategies represented in the mentioned models are the result of a combination of theoretical and empirical knowledge. On one hand, reflection on O'Keefe and Fogg's theories of persuasion and on their integration with the theory about rational and a-rational persuasion described in (Miceli et al, 2006). On the other hand, analysis of the corpus of 'natural' persuasion messages in the domain of healthy eating that we had collected in the initial stage of this Project (de Rosis et al, 2006).

Translation of persuasion strategies into a natural language message or dialog turn. The focus of this part of our research is on how the reasoning process which brought to selecting a given persuasion strategy may be translated into a natural language text: what should be said and in which order, what may or should be omitted, how the discourse plan may be rendered.

To this aim, we started from reasoning about argumentation schemes proposed by Walton and Colleagues, to extend them so as to enable representing some of the a-rational persuasion strategies at which we had worked with ISTC-CNR and which are described in (Miceli et al, 2006): in particular, appeal to the goal of feeling some positive emotions or not feeling some negative ones, appeal to cognitive dissonance and others.

In cooperation with ISTC-CNR, we studied how the concept of 'enthymeme' should be revised in this context. We then came to translating results of these theoretical reflections into 'persuasion plans' and defined a XML language to represent them. Persuasion schemes and their associated plans are logically connected to the 'information chunks' employed in representing the persuasion strategy: dynamic assembling of these information chunks then comes together with dynamic combination of elementary plans, until the overall plan of a message is built.

Design and implementation of a prototype of persuasion dialog simulator. This system should be considered as a test-bed to validate the theories and methods we developed in the scope of this WorkPackage. Its agent-based architecture enables us to combine logical with probabilistic types of reasoning and formalisms to represent various aspects of the problem. This modularity also favours a progressive implementation of the various components. A first prototype has been already developed and will be integrated in the next step of the Project.

Queen's University of Belfast:

An experimental mood adjustment module has been developed for use with the Queen's Communicator. The scope for mood adjustment within the current Queen's Communicator is limited, because of the rule- and frame-based nature of the system's design: the system includes a generic confirmation strategy (it implicitly confirms new information by echoing a recognised value back to the user; repair-confirms information that has been changed by the user; and so on); and it uses domain-specific response generation mechanisms that enable it to respond appropriately to typical combinations of information that the user has provided in a particular business context.

Within the constraints of the system's generic confirmation and domain-specific response mechanisms, it has been possible to develop new mechanisms that avoid repetitiveness in the system's set-piece utterances ('OK', for instance, need not introduce every confirmatory utterance by the system), and lend appropriate affective variation to the system's more complex dialogue acts.

Even for simple confirmations, avoiding repetitiveness is not simply a matter of replacing a word or phrase by a synonymous one: broadly synonymous words and phrases often have an affective colouring that means they are not interchangeable in all circumstances (while 'fine' may be a broadly positive confirmation, 'brilliant' is a very positive one). Thus, even for rudimentary word substitutions the system has to have a concept of its own affective state.

We have given the system an 'affective state' by associating positive and negative scores with particular speech acts. Thus, for example, if the system has to perform a repair-confirm on a value that the user has changed, this has a negative effect on the system's affective state: the user has either changed their mind about a value that they introduced, or the system has misheard. Isolated instances of such events will not have a major effect on the system's affective state, since they are balanced by more positive developments, such as when the system performs an implicit confirm on a newly supplied value. However, recurrent 'negative' events will lead to a more negative system affective state, just as recurrent 'positive' events will give rise to a more positive system affective state. The system's affective state is represented as a point on a numerical range – a point in the middle of the range represents neutral affect, while the ends of the range represent strongly positive or strongly negative affect. An 'emotional state nudger' moves the system's affective state up or down the range according to the positively or negatively coloured dialogue acts that the system has to perform.

The system has at its disposal a selection of appropriate synonyms that it can use to express a particular speech act in a particular affective state (e.g. an introductory confirmation like 'OK...', may be replaced by 'Brilliant...' if the dialogue is progressing well). Some synonyms are appropriate for use in more than one state; others are exclusive to a very positive or a very negative state. The system can select at random between the synonyms that are available for the state. For the more specialised phrases that are used to express particular dialogue acts, the system has a range of more formal (verbose) or less formal (brief) phrases that it uses according to whether the dialogue is progressing

well or badly, as reflected by the system's current affective state. For output to an avatar and speech synthesiser, system phrases and affective states are associated with APML tags, which determine the avatar's facial expressions and facial gestures (e.g. increasing or decreasing the breadth of smile as the system grows happier or sadder), as well as the speed of spoken delivery (faster for happy, slower for sad). If the system's affective state reaches the positive end of the affective scale, it can afford to omit unnecessary implicit confirmations, adding a further degree of naturalness. If the system, due to the user's failure to provide and confirm key information, crosses a threshold at the negative end of the scale, the system may decide to terminate the dialogue.

The current research does not claim to capture the many affective nuances of actual spoken dialogue, and controlling the rate of mood development and decay, and the manner of its generation, still requires fine-tuning. Nevertheless the experimental mood adjustment module serves to introduce broadly appropriate and recognisable affective colouring to what would otherwise be affect-free frame- and transaction-based interaction.

University of Paris 8:

We created an initial model for opening of conversation featuring an on-screen agent that is capable of approaching the viewer and conducting a variety of gaze motions as it does so (e.g. gaze at user, gaze away from user). Using this model, we conducted a user perception study in order to focus on some aspects of human gaze perception when interacting with an agent in a virtual setting. In particular, the evaluation focused on the users perception of the eye, head and body segment directions of an agent and also the assessment of the amount of attention and interest a human viewer considered the agent to be paying to them under different circumstances. Both static and dynamic situations were evaluated. In static situations, users were shown images of an agent posed with varying eye, head and body directions (for example, body and head oriented towards the user, but eyes oriented away). For each situation, they had to make a slider-based assessment of the amount of attention that they considered the agent to be paying to them. In this situation, it was reported that the eyes were the biggest determinant of perceived attention, followed by the head and then the body. For the set of sub-cases where the agents eyes were directed straight at the user, it was also found that higher ratings resulted when the other body parts were not oriented towards the viewer, as opposed to when they were. This suggests a relation between orientation contrast of body-parts and the strength of the perceived attention signal. In the dynamic studies, the agent moved around in the environment and making varying gaze motions towards users. Users were then asked to report on the amount of interest they thought the agent had in them during the encounter and their impression of the agents inclination and openness towards conversation engagement. Again, direction of gaze towards the user was found to be an important determinant relating both to the agent openness and willingness to engage in interaction.

University of Augsburg:

The integrated model of affect and politeness allows us to generate polite utterances based on the speaker's or addressee's emotional state. Analyzing the multimodal aspects of politeness behavior revealed that the distribution of gesture classes is not random related to the different politeness strategies described by Brown and Levinson (1987). There is no principled approach in the literature as to the effect of different gesture use on the communicative effect of politeness strategies. To find out whether a gesturing agent would change the perceived politeness tone compared to that of the pure textual utterances and whether the subjective rating is influenced by the type of gestures (abstract vs. concrete), we conducted an evaluation study with the Greta Agent (Rehm and André, to appear). This study was designed along the lines of a previous study testing the effect of different verbal politeness strategies (Johnson et al, 2004). We hypothesized that a distribution of gestures that follows findings from observations of human-human dialogue increases the effect of politeness tactics applied by an embodied agent. The results from the previous study could be replicated in the text-only and in the gesture condition. An increase in the effect of the chosen strategy could be shown depending on the animation quality of the gesture.

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Heriot-Watt University:

The current design for the Mobile Persuasive Guide involves a guide that will start the tour with a short ice-breaking session where it attempts to acquire information about the visitor's name and interests. The guide uses this information to select the appropriate sites of interest and story elements for presentation. The visitor input through the graphical user interface and receives output by means of audio, visual and text.

Storytelling is a form of persuasion where the guide draws the visitor into the world of story leading to affective engagement. Since life story is more interesting than just bare fact, the guide tells its own life story, at the same time relating them to the real artifacts or the site of interest with the main aim of persuading the visitors to visit the site and see for themselves the real situation and artifacts presented in the story. The visitor will be 'Walking Through Time' as the character guides them through the site presenting its life experiences reflecting the emotional impact of each experience.

It merges its own interests, past experiences and beliefs with the visitor's interests for personalized story generation. During the tour, it asks for visitor's feedback continuously to ensure that the stories are tailored to the visitor's interests throughout the tour. The content of the story and the way it is told is dependent on the guide's previous experience and mental opinion about that particular artifact or site. A past positive experience will result in good impression while a bad experience will lead to denunciation of a particular subject. The guide possesses an emergent emotion model and a set of emotional memories about its past which is application dependent has been derived, containing 'arousal' and 'valence' tags that contribute to its internal states [1].

Presentation of stories is accompanied by the resulting emotional states that fit the context and situation of the event, reflected through an animated face and a color bar. This will recreate the experience to a certain extent, giving the visitor a sense of presence. Indirectly, the guide attempts to invoke empathy in the visitor that is, putting the visitor in its own shoes. It attempts to encourage the visitor to look at a particular subject or event from its own point of view. Hence, different guides can provide the visitor with different perspectives about the same subject. The different sources of information combined with the visitors present knowledge can lead to a more comprehensive understanding of a subject matter as they can use this information to analyse, reflect and evaluate a point before arriving at a conclusion. This deeper understanding of a subject may change or enhance the visitor's existing belief/attitude about the subject and contribute to a greater appreciation of the cultural site. Since the story is directly related to a particular role of character, it will be more believable and comprehensive, hence produce a long-term memory effect in the visitor.

[1] Mei Yii Lim, Ruth Aylett & Christian Martyn Jones, *Emergent Affective and Personality Model*, The 5th International Working Conference on Intelligent Virtual Agents (IVA'05), LNAI 3661, Kos, Greece, September 12-14, 2005, ISSN 0302-9743

Cantoche

Following the Trento workshop, Cantoche worked on the achievement of the web based application for the city of Issy Les Moulineaux. Here is the latest development we made in order to promote the political campaign of the city:

- Sam is a trusted member of the community because he is already known by the visitors of the web site. He is present on the site giving good advice to the citizens and he is part of a monthly newsletter. The inhabitants of the city trust him as an expert of the city. Sam is up to date with the latest news of the city. *Expertise and trustworthiness emerge as basic dimensions of credibility because as a rule, only the conjunction of expertise and trustworthiness makes for reliable communications* [O'keefe, Persuasion Theory & Research]
- During the campaign, we added functionality on the web page that attracts the visitor in order to click on a link. This link opens a specific web site dedicated to the elections. The visitor understands immediately that Sam has a specific mission.
- The visitor is free to follow Sam on different scenarios (Sam can inform the visitor or Sam can be more specific answering questions the visitor can have) or can also send Sam and a message

to a friend. *When people use an interactive technology, they often respond to it as though it were a living being* [Foggs, Persuasive technology]. In this case, Sam is the catalyst for the propagation and brings social to messages [Read *The Social life of documents* by John Seely Brown].

- The web site proposes different topics that interest every citizen in reference to the elections. Sam is able to speak about every topic. Thanks to his voice and fun behaviour, Sam makes the elections process more approachable.
- The visitor forwards Sam and a selected message to a friend. This one reads the message and is inviting to visit the web site to do the same. People like Sam. He is credible as he has been sent by other trusted friends. *People should agree with people they like and people I like usually have correct opinions* [O’Keefe, Persuasion Theory & Research].

The city of Issy-Les-Moulineaux didn’t provide accurate results but the experience shows that people who visited the web site almost always sent a scenario to at least one friend.

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