

# Vista: Interactive Coffee-Corner Display

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**Abstract**

In the contemporary information-saturated world, there is a need for an easier, faster, and more social way to keep office workers updated and better aware of surrounding activities. Today's information management systems tend to consume time rather than simplify information sharing.

The Vista system tries to solve this problem. It is designed to be used in places of social interaction, where it displays information about professional activities happening in the department. In this paper, the origins of the project, the user-centered design process, and iterative evaluation of the concept are described. The paper concludes with observations regarding the social acceptance of Vista and reflections on future research aspects.

Vista is the result of a design project conducted in cooperation between the User-System Interaction postgraduate program at Eindhoven University of Technology, and the Research Group of Océ Technologies in the Netherlands.

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**Keywords:** interaction design, interactive displays, public displays, office and workplace, social awareness, walk up and use systems, user-centered design, visual system design

## Problem statement

### *Problem*

We are living in an information-saturated and information-driven world. Office workers find themselves overwhelmed with spoken and written information coming from every possible direction, while piles of documents on their desks and the email folders continue to grow. Most people cannot find time and energy to go through this growing mound of data, especially as a lot of needed information is either difficult to find, hidden somewhere on the intranet, or arriving through already overloaded channels, such as email. Thus, although people working in an office often want to know what is going on around them, providing them with necessary updates via intranet or email only adds to the problem instead of solving it.

Besides staying informed, people also like others to be aware of their activities. In practice, however, it takes a lot of effort to prepare written information that would be easily digestible by others, and there is often insufficient time to share the information verbally with everybody who comes along. Moreover, people may be reluctant to share information about topics or tasks which are yet unfinished or confidential.

This leads to the conclusion that office workers would like to be kept informed about their colleagues' activities in an effortless way, but neither be confronted with information where and when they are already flooded with it, nor forced to spend time preparing updates for others. Therefore, a solution would be to gather such information automatically and make it available where people do not need to put in effort to retrieve it.

### *Goal*

The purpose of the Vista project was to design a system that could be placed in a social area, offering an effortless and social way to keep office workers informed about the activities, projects and profiles of their colleagues.

### *Objectives*

To encourage socializing, motivate general interest, and stimulate workers to exchange knowledge while away from behind their desks, the information should be presented in a social space, such as a coffee area. Currently, coffee corners are already used very often for informal communication between co-workers, exchanging sensitive, gossip-like, and otherwise hard-to-acquire information about private matters and work (e.g. usually undocumented lessons learnt and failed plans) [17]. However, in this setting there are limited opportunities for groups (and their knowledge) to blend together.

Vista would attempt to change this state of things by:

- providing better awareness of the projects and activities of colleagues, also those in other groups;
- triggering social interaction between people in the coffee corner.

The system should use a representational medium, following a "calm computing" design philosophy, enhancing people's peripheral reach without overburdening their attentional system [19]. In principle, the aim is not to create a system giving access to detailed information, but to initiate interaction between office workers on mutually interesting topics.

Vista should be attractive, beneficial to its users, and draw attention without being overly intrusive. It should be possible for people to influence which information is displayed. The interface should be interactive and support effortless, quick access to easy-to-digest and up-to-date information.

The system should depend on the reuse of already existing information to the maximum possible extent. Whenever that requirement cannot be met, the effort required to prepare content and to submit it should be reduced to a minimum.

#### *Users*

The users of this system are office workers – more specifically knowledge workers. Drucker defines a knowledge worker as a person “who puts to work what he has learned in systematic education, that is, concepts, ideas and theories” [5]. Kidd adds that “[knowledge workers] are themselves changed by the information they process” [8]. Examples of knowledge workers include consultants, designers, researchers, developers, and managers.

The environment in focus has been limited to the industry, and more precisely to research and development departments within medium and large companies. The reason for concentrating on industry and discarding the academic world is due to different ways of information sharing. As discovered in the user study for this project, people in the academic world typically rely more on knowledge outside their own department (and even outside their university), whereas people working in industrial research departments share knowledge mainly within their department or company. Furthermore, the organization

in an industrial research department is typically more dynamic than in its academic counterpart, with projects continually starting and finishing while people move between them.

#### **Background**

##### *Project participants*

The Vista project was initiated by Océ Technologies and has become a design case project for five students from the User-System Interaction program.

Océ Technologies is a company developing solutions enabling its customers to manage documents efficiently and effectively. It focuses on professional environments and offers innovative print and document management products and services. The office remains one of the most important and challenging environments for the company business. Future solutions, which Océ intends to offer, extend the services concentrated around the printers and address the issues of document and knowledge management.

The User-System Interaction program is a two-year post-graduate program at the Eindhoven University of Technology in the Netherlands. It supports graduates with a Master’s degree in the engineering or behavioral sciences in developing themselves into professional designers who realize user-friendly interactions and apply a user-centered design cycle in their professional work. The program leads to the degree of Professional Doctorate in Engineering.

The members of the team – authors of this paper – have different backgrounds when it comes to both discipline (psychology, engineering, computer science and design) and nationality (Belgian, Chinese,

Indonesian, Polish and Swedish). Aga Matysiak and Ruud Janssen from Océ Technologies, also co-writers of this paper, coached the project.

### **Project dates and duration**

The Vista project has been completed during twelve weeks scattered between May and December 2004 (approximately 480 hours per person). A more detailed description of the project phases will be given in the section describing the design approach.

### **Challenges**

The main challenges the design team faced were related to time constraints. Only twelve weeks were reserved for the project and they were distributed between normal coursework.

Another challenge emerged due to the fact that equipment could only be bought after the conceptual design decisions were made, and the stakeholders were convinced that the investment was worthwhile. As a result, reliable alternative methods had to be found for intermediate evaluation phases.

There turned out to be a challenge to manage to reuse as many of the existing databases and information sources as possible and still display recent, up-to date and high quality information.

Since the final evaluation was to take place at Océ Technologies, the data presented by Vista had to be relevant to the office workers. However, most of the information about internal projects was classified and/or could not be automatically retrieved or even seen by the students in the project team. Additionally, the databases did not contain all the information that

was meant to be incorporated in the design. Therefore, the final prototype used manually inputted data.

### **Approach**

The project followed the principles of User-Centered Design and is summarized in this section, while the detailed results of all phases are described in the next chapter.

The first week was spent defining the problem and studying the literature in the areas of knowledge management and public displays. The study resulted in solution ideas that could later be compared with the user requirements for Vista.

A user requirements analysis followed for two weeks. Three subject matter experts and 25 potential users were interviewed. Furthermore, 5 user observations were conducted in coffee corners at customer's R&D department, similar departments at other companies, and in academia. Based on the interviews and observations, four personas were created and the affinity diagram technique [7] was used to extract further data. The result was a list of five core requirements. Also, two scenarios were developed to be used as a reference and for explaining the concept.

The conceptual design phase lasted for two weeks, starting with a brainstorm session about possible solutions according to requirements and scenarios. As soon as all the ideas were processed, decisions were made about which ones to pursue and look at in depth. The five-week detailed design phase was divided into four iterations with four different prototypes developed: a conceptual video prototype, a visualization prototype,

## Personas



Maura Dermot – the researcher – has been chosen as the primary persona. She is working in many different research projects, and it is her job to know what is going on around her, hence social contacts are a necessity. She is the individual who would benefit the most from Vista.



Eric Janssen – the newcomer – is also curious about what is going on in the company he is yet so unfamiliar with. He wants to learn about the company and is eager to build a social network. His needs are similar to the primary persona. However, he is much more interested in background information than Maura.

a Wizard of Oz prototype and, finally, a fully interactive prototype.

The conceptual video prototype, showcasing key concepts of Vista, was prepared during the first week. The movie was presented to the customer to evaluate the concept during a group discussion with eight prospective users and one manager. As the concept was accepted, a budget was allocated for buying the appropriate touch-screen display for the interactive prototype implementation.

In the visualization prototype evaluation, three groups of three subjects were used to assess the visual aspects of Vista interface.

Subsequently, specifics of interaction, presentation of content and navigation were tested using a Wizard of Oz prototype. Six pairs of subjects were asked to evaluate design solutions in a co-discovery test in a lab setting. Additionally, checklists [11][16] were used for a quick heuristic evaluation of the prototype.

Finally, an on-site evaluation at Océ Technologies was prepared, using a fully interactive prototype installed on a large display with a touch-screen overlay. The prototype was evaluated during four days with the end users in a coffee corner at the research department. Interaction events were logged and people's behavior was observed and evaluated.

## Design process

### Literature study

Research in the domains of knowledge management and display technologies brought to light solutions dealing with the combined problem of knowledge handling implemented on large screens. Several studies on public and situated displays have been carried out before the Vista project began. They could be divided into four different areas, reflecting key aspects of work that the technologies are designed to support. These are: Knowledge Work and Collaboration, Mobility, Awareness and Coordination, and Community and Social Connectedness [12].

Other research dealt with strictly public information [3], attempts to create a new collaborative interactive computer [9][18], linking personal and public interactive spaces [6], and various means of increasing awareness [2]. The approach of the design team was trying to combine both Awareness and Coordination and Community and Social Connectedness.

### User requirements analysis

Twenty-five students, managers, researchers, designers and developers from several different companies and universities were interviewed in order to gather the data. The questions asked dealt with information sharing habits and social interaction (with focus on coffee corners).

Based on the analysis of the users and their needs, it was decided that the project would be limited to industrial R&D departments. Four personas, based on the general characteristics of the users, were built to represent a precise and descriptive model and create a clear basis for the design. They turned out to be a

### Scenario fragment

(...) "I heard it's a nice initiative, Carol and Mike are also working on this one. And if there's somebody who knows everything about wireless, it has to be Mike."

To prove his point, John asks Vista to show more information about Mike. Maura studies it silently for a while.

"Impressive. I want a copy of that." She chooses the follow-up option. The prospect of reading the stuff on a computer screen frightens her off, but she can also request a printout.

Six minutes and five printouts later, she suddenly turns to John. "Damn!" "What?"

"My meeting started three minutes ago!" she screams and runs off.

John starts laughing and waves in her direction. Right after she disappears in one of the corridors, he hears her once again. "Damn!" "What?" he yells.

"I forgot about my coffee!"

useful method for building consensus and commitment to the design, as well as for communicating with stakeholders. [4]

The primary persona represented the main target for the design of the interface. The secondary persona helped defining some specific needs. Furthermore, there were two supplementary personas designed, who remain satisfied with the design for the primary persona, but had different goals to achieve using Vista. A short overview of the two major personas is included on the side of the previous page.

From the result of the interviews and the personas as a model, five requirements were defined, stating that Vista should:

1. present information about people working in the same department and about ongoing projects,
2. be designed to be used in places of social interaction (specifically coffee corners),
3. be reliable and require as little supervision as possible (automatically reusing existing information and databases to the maximum extent),
4. give follow-up possibilities, at least via email and print,
5. have a walk up and use interface that is easy to approach, easy to use and self-explanatory.

As a next step, scenarios were developed for the primary and secondary personas, representing typical work situations. When creating them, the requirements and personas' attitudes and goals were kept in mind. A fragment of the scenario is included on the left side of this page.

### Concept

Based on the findings of the user requirements analysis, as well as the literature research, the most important elements of the Vista concept were clarified, especially those enhancing the unobtrusive, social and interactive aspects of the proposed system.

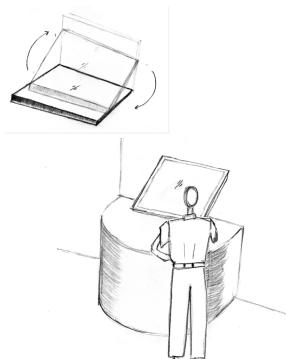
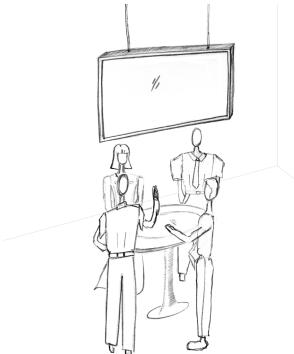
#### GENERAL CONCEPTS

One of the benefits of the considered "fluid" interface (described later) was that always-changing content could be adapted seamlessly to various situations, such as time of day (traffic information only makes sense when the working day is almost over), day of week (showing information about weekend activities on Friday), previous usage patterns, etc.

The personalization of the content would give even more possibilities. If it can be ensured that Vista knows who exactly stands next to it (which can be accomplished using various means, such as RFID in coffee cups, or identification via badges), this information can be used in many ways, all of them transparent to the users.

Information such as weather, traffic and much more can be tailored to the people watching it. The team also believes in the concept of "engineering coincidences" – for example, automatically determining common interests of people gathered around and showing projects or news that are of interest to all of them, which could spark a lively discussion and, possibly, future collaboration.

Vista would also allow the users to get a follow up of the information just viewed. Although interviewees indicated that they are overloaded with information,

**Considered form factors**

this follow-up option would have been perceived differently, as the users themselves specifically requested the information (to serve as a reminder or aid in further research). The combination of personalization and follow-up might also result in an on-demand newsletter, different for each user and being compiled automatically by the system.

All these ideas were believed to increase the attractiveness of the system and stimulate people both to use Vista frequently and to enter updated information to the system as a consequence of the social awareness and social pressure. Those factors can be further influenced by generating feedback with statistical data, reflecting the interest of others in one's information displayed on Vista.

**CONTENT**

As stated in the requirements, two main bits of information on Vista were projects and people within the same department. Based on the previous research, it was also decided to add other information (such as weather, traffic, public transport, world news and comic strips) that would serve as "ice breakers," important to support social interaction.

Most of the information should exist in two forms: concise (for general viewing) and more detailed (shown on demand). Figure 1 shows the initial design for these forms.

**John Smith**



Senior engineer  
R&D  
RG2, RG3, RG5

Expertise:  
Identification methods

Interests:  
RFID, smart sensors  
Radiotechnology

**John Smith**  
Senior researcher

Nickname: jsm  
Department: R&D  
Groups: RG3, RG6  
Location: building 1, room 3.65  
Phone: 2584  
Status: Working

Expertise: Identification methods  
Interests: RFID, smart sensors, Radiotechnology  
Projects: RFID coffee cup tags  
SIM as your ID

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**Figure 1.** Initial design of two forms of data: concise (left) and detailed (right).

Since one of the main requirements for Vista was the reuse of existing information, Vista should require zero maintenance after initial setup, being tapped to various existing sources of data usually present in most companies (employees database, project repository, intranet websites, etc.). Already busy people should not be forced to input data manually, but this option was also considered.

**FORM FACTOR**

A touch-screen display was chosen as a medium. Its properties matched the requirements, allowing to show up-to-date information in an interactive, easily digestible and unobtrusive form.

At this moment, a more specific form factor had to be determined. The team discussed and evaluated various possibilities, based on their ideas and literature research. The most important decision at this point was a choice between a wall-mounted display such as BlueBoard [13], Opinionizer [1] and OutCast [10], or a

## Video challenge

As the team decided against the use of blue screen, extra care was taken so people did not occlude Vista screen in shots requiring the interface to be visible. This proved to be a challenge for both the actors and the filming crew.



The whiteboard while filming



A still from the finished video

table-top display similar to Living Memory, DiamondSpin [15] and UbiTable [14].

The advantages and disadvantages of both variants were compared, based partially on the outcomes of previous projects using these displays. While table-top displays have a certain novelty value and seem more comfortable and socially-friendly, they also create many interface problems (such as text orientation), are more expensive and less natural to look at. Also, wall-mounted displays have the advantage of near-zero footprint, and are much more likely to attract people's attention. Therefore, the team chose the wall-mounted display as the one more fitting the requirements.

### INTERFACE

The use of a touch screen seemed most natural given the nature of Vista. Certain other solutions (such as a pointing device, speech interface or tangible buttons) were brought up, but only a touch screen fulfilled the walk up and use requirement and was likely to be intuitive to use by one or more users at the same time.

The system would use a fluid, attractive interface, bearing little resemblance to typical computer screens. This allowed creating an "attract mode" – information floating on the display, so even passersby can learn something – but with the unique option of on-demand clarification, by tapping on the interesting piece of information.

### *Detailed design: Video prototype*

As a first part of the detailed design phase, a short video prototype was prepared demonstrating the basic ideas of Vista. The movie had three purposes:

- assessing that the concept of the system is understood by people,
- presenting the idea to a sample of prospective users to initiate a discussion,
- convincing the powers that be to invest into the project (specifically, to fund a touch-screen display for further evaluation).

### DESIGN

The screenplay for the movie was based on two persona scenarios prepared in the user requirements phase. The story revolved around three people interacting with Vista (and later with each other) at the coffee corner at their work.

The design team deliberately focused on showing the concept of the Vista, and not the specific interaction details. The goal was to present Vista as a walk up and use, social device, initiating conversations and engineering coincidences. However, even at this point glimpses of Vista's interface exhibited many of its future properties, such as color-coding different categories of information, animated transitions, and two main states: an attract mode for opportunistic browsing, and zoomed-in on-demand mode with more details.

### SETUP

While filming, Vista was simulated by a standalone whiteboard that was placed next to the coffee and vending machines in the hall of one of the university buildings. The animations from Vista prototype were later superimposed in postproduction.

The early prototype was developed on a Macintosh platform in Objective C, using OpenGL with custom-made bitmaps for graphics and animation. The movie itself was edited using Adobe Premiere Pro.

#### EVALUATION

The finished 3-minute video (submitted with this paper) was presented to five colleagues from the User-System Interaction program, asking for their general impressions. The concept shown in the video seemed to be understood perfectly. The only questions received dealt with details of interaction and underlying technology.

#### Lab setting

This laboratory prototype with back-projection and tangible buttons was used for visualization and interaction tests.



Subsequently, the concept of Vista and the video prototype were presented to a group of eight researchers and one manager at Océ Technologies. The key findings from that discussion were:

- the novel approach to interface seemed interesting and was received favorably,
- browsing and navigation issues have to be carefully evaluated and addressed,
- it was debatable whether Vista can be left without supervision, drawing information automatically from various sources; the concern was that this approach might result in obsolete, uninteresting information.

The video and presentation was convincing enough for Océ Technologies to sponsor a touch-screen plasma display for use in the further evaluation phases.

#### *Detailed design: Visualization*

Having validated the concept, it was decided to devote the second design iteration to details of information visualization and interaction. Therefore, the team

proceeded with testing the prototype with users in a laboratory. In order to find the best design choices for Vista's attract mode, the first test conducted was a non-interactive visualization test.

#### DESIGN

It was decided that Vista's attract mode shows random bits of information in cards floating on the display. Four properties of this mode that were of most importance were singled out:

- display orientation (horizontal vs. vertical) and card movement direction – affecting the way information is presented on the screen,
- card movement speed – influencing the (un)obtrusiveness and possibility to easily grasp the information by passersby,
- card size – determining the number of cards on the screen and the amount of information on each card,
- card shape (rectangular vs. circular) – determining the visual style and some of the interaction concepts.

The test participants were shown Vista interface with variations within these properties.

#### SETUP

The test was conducted in the usability lab. Vista was displayed using a back-projection system built especially for this purpose, with the size of the image similar to that of a 30" display. The problems with the low brightness and narrow viewing angle were, to a great extent, overcome by dimming the lights and proper positioning of the users.

Due to the customer's request, the prototype had been rewritten to work on a PC platform (using Visual C++

and OpenGL). In retrospect, this proved to be a good step, considering the future possible compatibility issues.

#### EVALUATION

In total, 16 versions of the attract mode interface were shown to three groups of three users, who were then asked to rank them and choose their preference.

The results indicated that the users preferred the right-to-left movement for rectangular cards and bottom-to-top movement for circular cards (reminiscing them of water bubbles). After some deliberations, the design team decided in favor of the former solution, due to reported lower legibility of text in circular cards. The users also opted for low-to-medium movement speed (with each card's screen life of about one minute) and big card size (with 6-8 cards on the screen at the same time). This setting was described to be more relaxing, and giving an appropriate amount of time to grasp the presented information. These results were implemented into the prototype and taken over to the next phase.

#### *Detailed design: Wizard of Oz*

The second half of laboratory testing focused on finding out whether the users understood the interaction ideas, and whether the device conformed to the walk-up-and-use requirement.

#### DESIGN

The interaction principles were now formulated more clearly. These were:

- **simplicity:** the device should support walk-up-and-use interaction, containing only bare bone functionality,

- **non-computer look:** the device shouldn't look like just another computer screen, hence the absence of windows, hyperlinks, close buttons, etc.,
- **attractiveness:** the interface should be as visually attractive and elegant as possible, without being distracting or annoying,
- **continuity:** the interface should not consist of separate modes, but rather show smooth transition between all of the actions.

Vista's interaction and visual design were also refined in this phase. The following paragraphs explain them in more detail, and the 5-minute video showcasing main interaction ideas is submitted with this paper.

In the default attract mode (pictured in Figure 2), information cards can be seen floating slowly from the right to the left border of the display. These cards contain short information about projects, people, and "ice-breakers" (news, weather, traffic, popular comics).

This mode supports getting fresh information just by looking at the display while passing by. However, some control is given in the form of buttons: two for rewinding and fast forwarding, four for requesting a new batch of cards to be displayed (people, projects, local information and comics, respectively), and two for requesting a follow-up to the viewed information in the form of a printout or an email. The cards flowing on the screen also act as buttons – after being tapped, a card zooms in to reveal more information.



**Figure 2.** Vista's attract mode (screenshot from later version of the prototype, with three request buttons).

In the zoomed-in mode (Figure 3), a card contains links (in form of buttons) that can be followed by tapping them. Navigation between cards is accompanied by animation, with the old card moving to the side and the new card appearing smoothly in its place. The users can follow navigation history by tapping the cards or the left/right buttons located in the same place as the rewind/fast forward buttons in the attract mode.

Another form of navigation is requesting cards with similar property to the one being viewed (for example: other people with the same expertise). The new cards are then zoomed in around the original card.

To return to attract mode, the user has to tap outside of the card, on a still visible background.



**Figure 3.** Zoomed-in mode with detailed information about a person.

#### SETUP

The test was again conducted in the usability lab, reusing the back-projection system from the previous test. However, as a touch-screen was not yet available, the team was forced to use the Wizard of Oz technique, with the operator repeating users actions (tapping on the glass the image was projected on) on a second console connected to the prototype.

This setting required a lot of training and preparations (due to the visual nature of Vista's interface, the operator had to use both mouse and keyboard while looking at users actions on the monitors), but – some minor mistakes notwithstanding – it worked out well. However, it prevented the team from testing some more sophisticated interaction techniques, such as dragging.

Contrary to the previous test, it was decided not to present the users with alternative versions of the interface, but assess only the ideas that were considered best. The only difference between the tests was that half of the participants were given a display with buttons on it, while the other half a row of tangible buttons below the screen.

#### EVALUATION

The co-discovery test was conducted with six pairs of participants, each given four tasks. Unfortunately, due to limitations of the prototype, participants could not be given the possibility of free exploration. As the approachability of Vista was one of the main aspects to be tested, users were not informed beforehand that they would be standing in front of a touch-screen interface.

The users were observed, while their behavior (such as frustration, confusion and satisfaction) and useful remarks were noted down. Afterwards, participants were asked to fill out a questionnaire and, most importantly, give comments about how they experienced the system.

The experiment showed that touch-screen controls give a better indication of the nature of the display than tangible buttons. Also, the results validated many of the design decisions (such as the absence of the close button, in accordance to the non-computer look principle) and questioned others (such as navigation). In general, however, Vista was perceived as an attractive, easy to use device.

After the tests, Vista was also evaluated using the heuristics of Somervell, Wahid and McCrickard [16] and

Mankoff, Dey, Hsieh, Kientz, Lederer and Ames [11]. The device turned out to meet most of the recommendations. The only major question that could only be answered by an on-site test was that about a "peripherality," or unobtrusiveness of the display.

#### *Detailed design: Interactive prototype*

The final test of Vista was an on-site evaluation at Océ Technologies, using a real touch-screen display and a real set of data. This evaluation was supposed to retest Vista's interaction design (now with the intended user base), and also address the social aspects. While the latter could not possibly be assessed properly in the limited time left for the test (only four days), it was decided to at least look through initial results.

#### DESIGN

The prototype was slightly modified according to both the lessons learnt from the previous test, and the requirements of the new display. The changes included renaming and consolidating categories, implementing dragging as another means to scroll the field, adjusting the resolution of the screen and size of the cards, and moving the buttons to the top of the screen (due to the screen being positioned lower than originally expected).

However, the most important change at this point was the replacement of random data with real data of 45 people and 25 projects from Océ Technologies' R&D department. Unfortunately, time limits prevented the team from fully implementing automatic data retrieval from the company's intranet databases. Therefore, all information had to be collected and prepared manually.

**SETUP**

The 50" plasma touch-screen display (see Figure 4) with a dedicated computer was installed in a popular coffee corner in a building frequented by both researchers (the target user base) and engineers. Vista was active for four days, during regular office hours.



**Figure 4.** Vista interactive prototype installed in Océ Technologies R&D department. The conference room on the right was used for observation.

The Vista system was logging all the interaction, and during the first and fourth day the team members were also discreetly observing the activity around Vista from a room located next to it. A small pinhole camera mounted on top of the system was used to give a better understanding of people's actions and intentions, which were logged by two observers (including number of people passing by, looking at Vista, approaching it within 1.5 meters, interacting with it and talking about it).

A logbook was placed next to Vista for people to write their comments in, and the contact information for two supervisors of the project was given. Additionally, 30 people were approached after leaving the coffee corner with a short interview regarding their initial experience with Vista.

**EVALUATION**

The users tested every part of Vista's interface to an extent that surprised the whole team. The comprehensive test, as well as observations, served as a basis for small day-to-day changes in the interface that enhanced the user experience (such as longer print feedback, and higher sensitivity and more empty space for dragging).

	<b>Looking</b>	<b>Approaching</b>	<b>Interacting</b>
<b>Day 1</b>	85%	35%	18%
<b>Day 4</b>	73%	24%	7%

**Table 1.** Percentages of coffee-taking passersby reacting to Vista.

The results of the observation on both days can be seen in Table 1. While the numbers for the fourth day are lower than initial percentages (most likely due to the novelty factor wearing off), 73% of passersby looking at Vista is still higher than the 50% threshold that was set by the design team as a success measure.

Results from the interviews indicated that most of the users were having no difficulties in recognizing a touch-screen nature of the device, and using its interface for the first time. The reported problems included understanding of rewind/fast forward buttons and sometimes less-than-perfect feedback (e.g. it wasn't always clear what exactly would appear on a printout).

Interviewees mentioned, and observations confirmed that many people discussed Vista. However, more than half of the users were engineers outside of the intended user base. The information on the display was therefore not relevant to them, and their conversations focused mainly on the implementation aspects of the system. Nevertheless, about half of the interviewed people stated they learned new things about ongoing projects and their colleagues.

When asked about their general impression, a majority rated Vista as good, nice, friendly, calm and attractive. Suggestions of improvements included many ideas already thought about in the earlier phases, but rejected due to time constraints or technical problems (e.g. world news, email follow-up, connection to Océ internal databases).

Based on these preliminary results, Vista can be considered a success. However, these results are very likely biased by the "wow" factor of a big touch-screen display, as well as the known effect of users merely saying what they thought the interviewers wanted to hear.

## Results

The purpose of the project was to design a system for social areas, effortlessly informing office workers of the activities of their colleagues. It is believed that this goal has been met. Comparing the outcomes of final prototype evaluation against the requirements, it can be concluded that:

1. Vista succeeded in presenting interconnected information about people and their ongoing projects, as well as additional information not related to work.

2. The tests at customer's site and the evaluation confirmed that Vista fits the social and hasty nature of coffee corners.
3. There was not enough time to fully address the issue of putting the information into Vista, either automatically or manually. While some groundwork has been done (both on paper and in the prototype), this feature remains far from being finished.
4. Information follow-up was implemented only partially – basic printouts were available, but the email feedback option was removed. However, logs indicated about 60 printouts being requested by the users, which would indicate that this option is noticed and used.
5. The results of the final evaluation confirm that the goal of Vista – supporting walk-up-and-use interaction without initial training – has been achieved.

The most important part of the future work should be the development of mechanisms to draw the data automatically from existing sources in customer's information infrastructure (currently consisting of various isolated intranet databases). This turned out to be more difficult than anticipated. As soon as those mechanisms are implemented, Vista could be tested for an extended period of time to gather more reliable and valid data.

The personalization and coincidental nature of Vista, largely abandoned due to technical difficulties in identifying people around the display, should also be addressed, as it is believed it could bring some added value.

The on-site evaluation of Vista brought an interesting, if somewhat unexpected side effect – seeing a working prototype convinced some people of the benefits of a fully automated and more intelligent Vista. Indeed, some of them were now themselves proposing connecting the prototype to various parts of the corporate Intranet, or creating a knowledge management system that Vista could be tapped into.

The interest in Vista did not stop at that. Observations showed fascinating evidence of people learning new things ("I didn't know he was an expert in **that**"), social pressure ("I also want to be on Vista"), people creating their own "Vista image" (most of the people starting interaction with the device tried to look for their own card first, and some users quickly submitted changes to their profiles so as not to appear "so nerdy") and overcoming their initial hesitation ("Now I would like my data to be there as well"). These observations speak well of the social nature of the project. The team was also glad that the original doubts about people having problems with their photographs and data floating in a semi-public space were put to rest.

As for the project, in hindsight the team would prefer to allocate the time differently. Probably, defining the user profile better from the beginning would have resulted in spending less time on interviewing, and leave more time for the final evaluation.

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