



WHITE PAPER

Enterprise Imaging

Persona based approach

Why design for personas?

1. Introduction

Designing for a persona focuses the design to meet the needs of that persona and all the users he or she represents. When car manufacturers design cars, they design for specific drivers. Otherwise, automobiles would try to meet too many needs and would satisfy no one. Imagine trying to design a convertible sports car with the cargo space of a minivan, the power of a V8 engine, and the efficient gas mileage of a motorcycle. By trying to meet the needs of many drivers, this vehicle satisfies none of them. Think of the Renault Espace: it was a very successful car even though it only satisfied the needs of families with children.

2. The principle

Personas are a user modeling technique. A persona is a description of a specific person who is a target user of a system being designed. Typically, multiple personas are developed that represent the spectrum of the target audience.

Personas are presented as specific, individual humans with needs, preferences, biographical information, and a photo. They make it easier for designers and developers to identify with the application user. Personas are useful when describing and communicating about use scenarios. On the other hand ambiguous user definitions lead to confusion and misunderstanding.

3. Goals vs tasks

The design process is goal-directed, not task-oriented. Different users represented by a single persona might have different tasks. As long as the goals of these users are the same, though, one persona can accurately represent them.

For example, a system administrator starts his day by checking his office voice mail, his email, and his cell phone voice mail. Improving the method he uses to perform these tasks might help him somewhat, but his goal is not to check messages. His goal is to monitor and manage the system so that the hospital work runs smoothly and the users of the system can do their jobs well. If design helps him do this, it might be able to eliminate some or all of the tasks.







4. Personas are grounded in user research

The personas used in Enterprise Imaging have been drafted for Agfa HealthCare by the team of Alan Cooper. He created the Goal-Directed design methodology and pioneered the use of personas as practical interaction design tools to create high-tech products. His team interviewed stakeholders at Agfa in Waterloo, Ontario and product managers in Milwaukee, Wisconsin. Then they visited hospitals across North America and spoke with radiologists, PACS administrators, IT staff, and Agfa services representatives. They came to Europe and did interviews in Italian, Belgian, Dutch and German hospitals. Most of the interviews took place in reading rooms, making it easier to discuss common communication and information patterns, and identifying key behaviors in the reading and interpretation of diagnostic images. The personas are continually updated with information retrieved at field trial sites, trade fairs and user-testing. Example: Peter, the radiologist, now has a tablet computer and a smart phone, he posts Tweets on Twitter and updates his Facebook account. All of these didn't exist back in 2004 when Cooper described the persona.



5. How are the personas used?

The personas are introduced to new Agfa R&D team members when they start to work on the project. They are kept alive with posters in all team offices.

Personas

Peter	Miranda	Amy	Donna	Sam	Grace
					
Personal Goals • Always make the right call • Feel effective, productive, and confident • Ensure that his work is helping people • Make time for himself	Personal Goals • Don't make mistakes • Get the work done • Be home in time	Personal Goals • Help people stay healthy • Have as much control over her patients' welfare as possible • Find the right way to communicate with each patient • Find the right treatment	Personal Goals • Keep the waiting room running smoothly • Help everybody who comes to her desk • Good team spirit to cope with daily stress • Do it by the book (don't make mistakes)	Personal Goals • Focus on the patient • Successfully complete the exam • Never let the patients see him sweat • Keep his head above water	Personal Goals • Keep everybody happy • Find the right solution • Be the calm in the storm
Core Activities • Interpret • Consult	Core Activities • Transcribe • Correct	Core Activities • Evaluate • Apply	Core Activities • Patient attending • Scheduling • Invoicing ?	Core Activities • Correlate • Select • Capture • Assemble	Core Activities • Monitor • Define
Practical Goals • Streamline interpretation • Facilitate collaboration • Remove redundancies	Practical Goals • Streamlined switching between tasks • No break down • Fast & reliable tools	Practical Goals • Streamline evaluation & application • Facilitate collaboration • Remove redundancies	Practical Goals • Streamlined switching between tasks • No break down • Fast & reliable tools	Practical Goals • Streamline exams • Support collaboration	Practical Goals • Monitor system • Establish protocols

Diagnostic Viewing

Ben	Carlos
	
Personal Goals • Keep the system running at peak form • Don't get bogged down in clinical details • Protect his time	Personal Goals • Make the system work the way the customer wants it to • Fix problems quickly • Look like he knows what he is doing
Core Activities • Monitor • React	Core Activities • Configure • Optimize
Practical Goals • Monitor system • Facilitate quick reaction	Practical Goals • Powerful tools, no cumbersome configurations • Extract data from the running system • Maintenance plans and checklists • One-stop docs for all products, including those that aren't ours

Poster with the personas of Enterprise Imaging

Documents describing user interaction and scrum stories defining the work for the software developers from an end-user perspective (agile development) are formulated with personas as actors. The personas are referred to during internal meetings by Agfa R&D and product management when requirements and designs are discussed.

7. Examples

Peter, Radiologist

The Activities overview

In legacy PACS systems, Peter used to consult query lists to select the studies for his reports. Enterprise Imaging for Radiology offers activities overviews to streamline this triage.

An activities overview is a fine-grained set of tasks and studies. Part one is a To do list, fed by several task lists. It is always up to date: new tasks are pushed to it and completed tasks are purged. Part two of the activities overview is for follow-up. The fine-grained sorting helps Peter in setting the right priorities. When set up well Peter's activities overviews allow him to be more productive and to have a better overview. He wastes less time on the manual selection of studies to report on. By creating tasks for all incoming studies and by pushing those tasks to the right task lists, the workflow engine makes sure that all the work ends up on somebody's plate.

As Peter doesn't like to be told what to do, the activities overview should not constrain him. He can still decide how he will use it: to cycle the To do list, to cycle a sub list of the To do, to cycle an ad hoc selection of tasks or to cherry-pick individual tasks. He can switch to another activities overview. He can edit the activities overviews if he has the permissions to do so. All of these options are easy to accomplish.

In one field trial site the radiologists start the To do list - not filtered - during their routine work. Sometimes a sub list is used: (eg for review tasks, signoff tasks) and sometimes they select a list from follow up eg completed today.

At another field trial site all radiologists use the same activities overview except for the chief radiologist. Their To do is filtered by default not to include mammo tasks, as these are performed by a dedicated rad. They hardly ever cycle the whole To do, but they select what they want to read. The Follow up is not used a lot. The chief radiologist uses a different activities overview. It combines the same To do that the other radiologists use with a different Follow up to monitor the other radiologists in terms of tasks performed in one day.

Darkroom theme

Peter usually works in a dark room: a reading room with reduced lighting for the sake of eye adaptation. That is why most diagnostic desktops including the Enterprise Imaging Radiologist desktop have dark GUIs. Personas working in rooms with regular light get brighter interfaces: administrators and secretaries.

The screenshot shows the 'Diagnostic desktop' application. The top menu bar includes 'File', 'Edit', 'View', 'Tools', and 'Help'. Below the menu is a toolbar with icons for 'Add', 'Search', 'Lists', 'Text', 'Images', 'Web', 'Start reading', and a settings gear. The main interface is divided into three sections:

- Started tasks (3):** A list of completed tasks:
 - Reading (James Barnett, CT Chest, 07/07/2009 – 14:39)
 - Reading (Carmen Alvarez, CT Head, MRI Head, 07/07/200 – 12:34)
 - Reading (Nicolas Myers, MRI Spine, 07/07/200 – 11:13)
- Activities Overview:** A sidebar with filters for 'Peter's MR Program'. It shows:
 - To do (filtered): 8 STAT! 150 Total
 - New Head MRs: 4 / 12
 - New abdominal MRs: 4 / 19
 - Other MRs: 2 / 7
 - Sign Off: 4 / 34
 - Review Tasks: 87
 - Follow up:
 - Resident MR Readings: 1 / 1
 - MR studies: 24
 - Teaching: 5
- MRI Program - To Do:** A table with 15 tasks, 1 STAT! The table has columns for status icons, a patient icon, and patient details.

Patient & Ordering Physician		
!	James Barnett	7894004576
	Dr. Joseph Wittmann	
	Catherine Mutzenhardt	9400649770
	Dr. Francis Rheingold	
	James Barnett	7894004576
	Dr. Dominique Bouffard	
	Carmen Alvarez	9300489477
	Dr. Maria L. Aguirre	
	Nicolas Myers	7764800581
	Dr. Yveline Ulrich	
	Jean-Marc Tagliaferri	7760100499
	Dr. Jean-Marie Falconett	
	Anne Young	7695001212
	Dr. Yveline Ulrich	
	Guido Van Even	7695001212
	Dr. Dominique Bouffard	
	Tomas Verplancke	9514018070
	Dr. Yveline Ulrich	
	Jenifer Robertson	9609108774
	Dr. Yveline Ulrich	
	Jenifer Robertson	9609108774
	Dr. Yveline Ulrich	
	Jean-Marc Tagliaferri	7760100499
	Carmen Alvarez	9300489477
	Dr. Maria L. Aguirre	
	Nicolas Myers	7764800581
	Dr. Yveline Ulrich	
	Catherine Mutzenhardt	9400649770
	Dr. Francis Rheingold	

Activities overview – To do list

Loading and starting the tasks automatically: “cycling”

Even though the activities overview is helpful to Peter, he doesn't want to see it most of the time. He is focused on the images and on the reports he writes. That is why the default behavior in Peter's desktop is that when a task is completed the next task loads in Text area without switching back to the list. The tasks are started automatically which saves an extra click per task.

NOTE: Starting a reading task only sets the system in standby mode. Peter still needs to push the record button on his speech mike to start recording.

Grace, Ben and Carlos : Administrators

- Grace, departmental Clinical Coordinator
- Ben, IT Manager
- Carlos, Agfa Field Engineer

All of these personas need to find their way in many different topics and tools. Therefore they need a good navigation, a consistent interface and clear terminology.

Terminology

A lot of effort has gone into developing consistent terminology. This makes it easier for all personas to communicate. The terms should be consistent within the application but also consistent with DICOM, IHE, HL7, Microsoft Office, Internet Explorer, Google, Lotus Notes,... Special care was taken to label the new “inventions” by the Enterprise Imaging workflow platform: activities overviews, task assignment groups, permission sets, procedure plan steps, collection lists...

The terminology team sets up the terminology database and checks the requirements and the application. The database is available online for all project team members.

Navigation

The navigation was established through a card sorting exercise with all administrator personas. They roughly agreed on one navigation, optimized for monitoring, not for initial setup. It only goes 2 levels deep: there are categories and subcategories.

Alternative views

The navigation is available in two views: a tree view and a list view. These views re-use two well-known design patterns: the list view, known from the Windows control panel and the tree view, such as in the Windows Management Console.

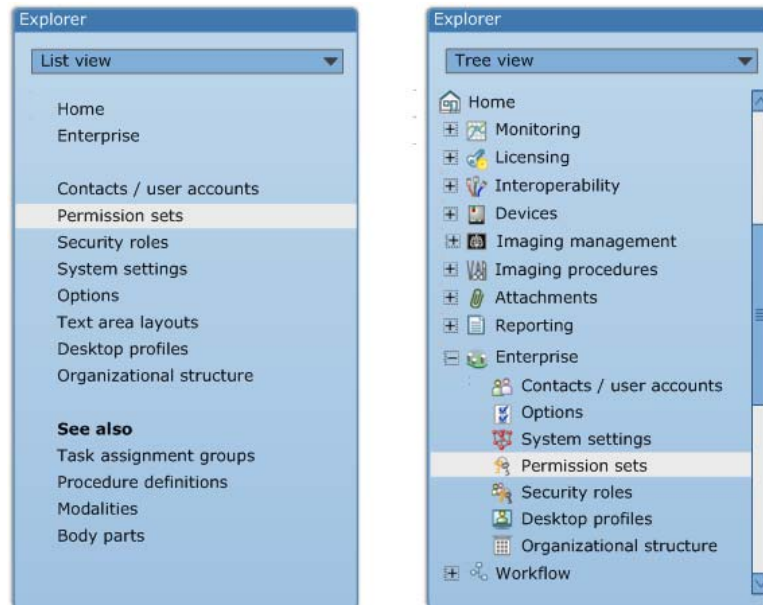
Notes on pattern design

Interaction design patterns are recurring solutions that solve common design problems. Benefits include:

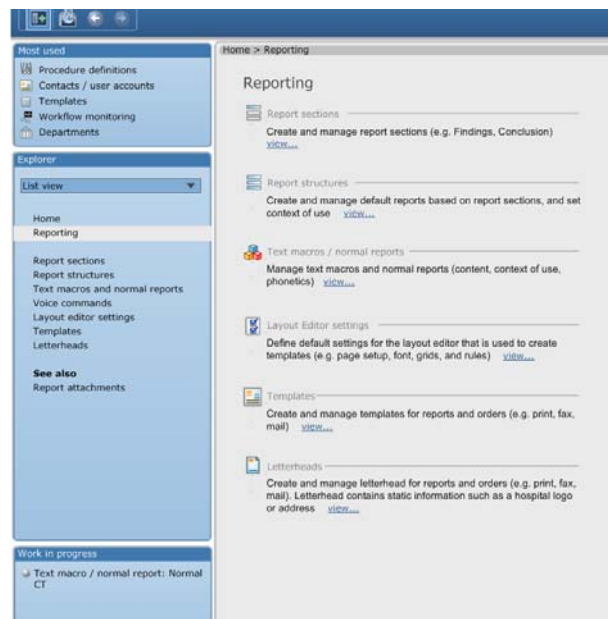
- Reduced training time by re-using the knowledge that users already have
- Making users feel more confident in using the software as it has a “familiar” feel
- For the designs: eliminating wasted time spent on “reinventing the wheel”

Re-using design patterns doesn’t prevent us from having our own look and feel, defined in the NICE Guidelines.

As an administrator Grace has the least technical profile. She is a nurse with great communication skills and a special interest in IT. For her the list view was developed. It combines lists of categories and cross-links with introductory pages containing large icons and short help texts.

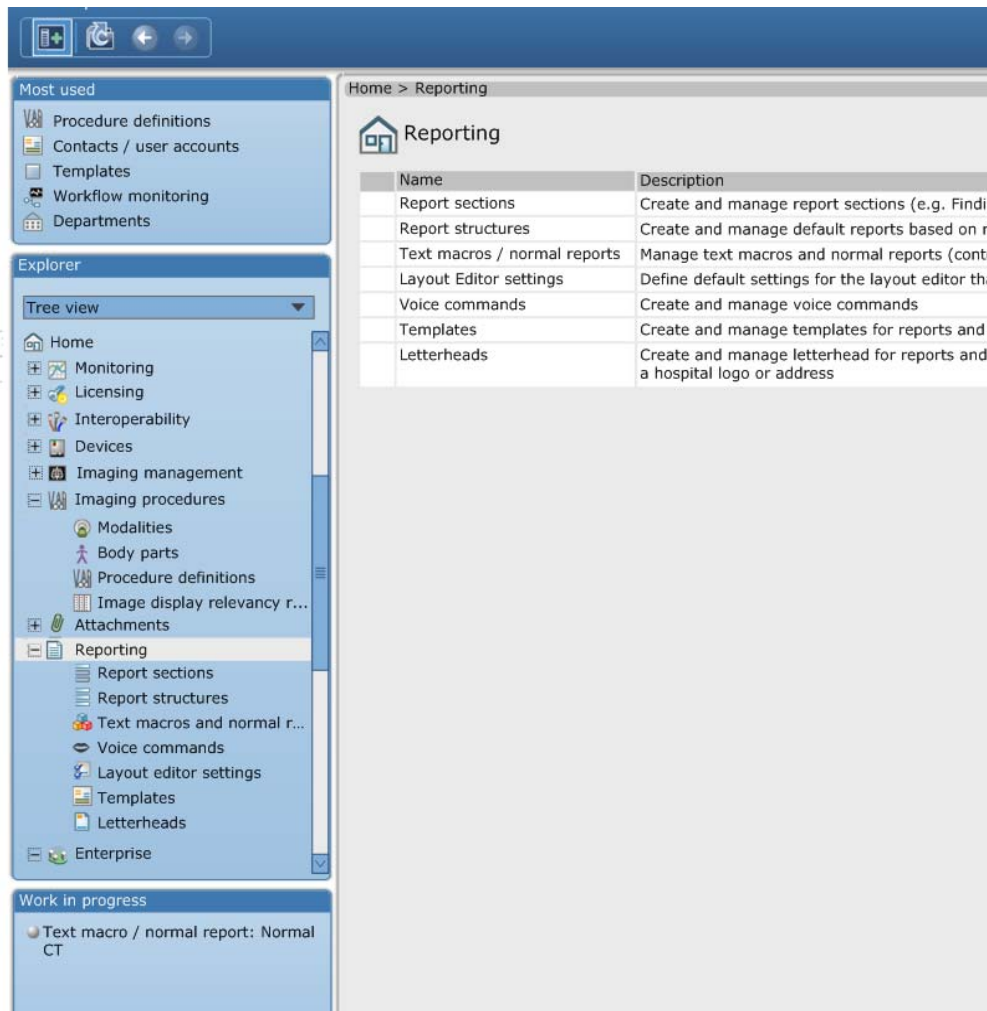


List view - Tree view



List view – Category page

Carlos and Ben are technical profiles. For them we have provided a tree view. It combines a navigation tree with list tables.



Tree view – Category page

Cross links

The list view offers See also links, pointing to related categories. The tree view, doesn't have this feature, but there are still cross links in the content pages, offered in the places where they are most useful. When you navigate away from a screen without saving a link is added in the Work in progress pane.

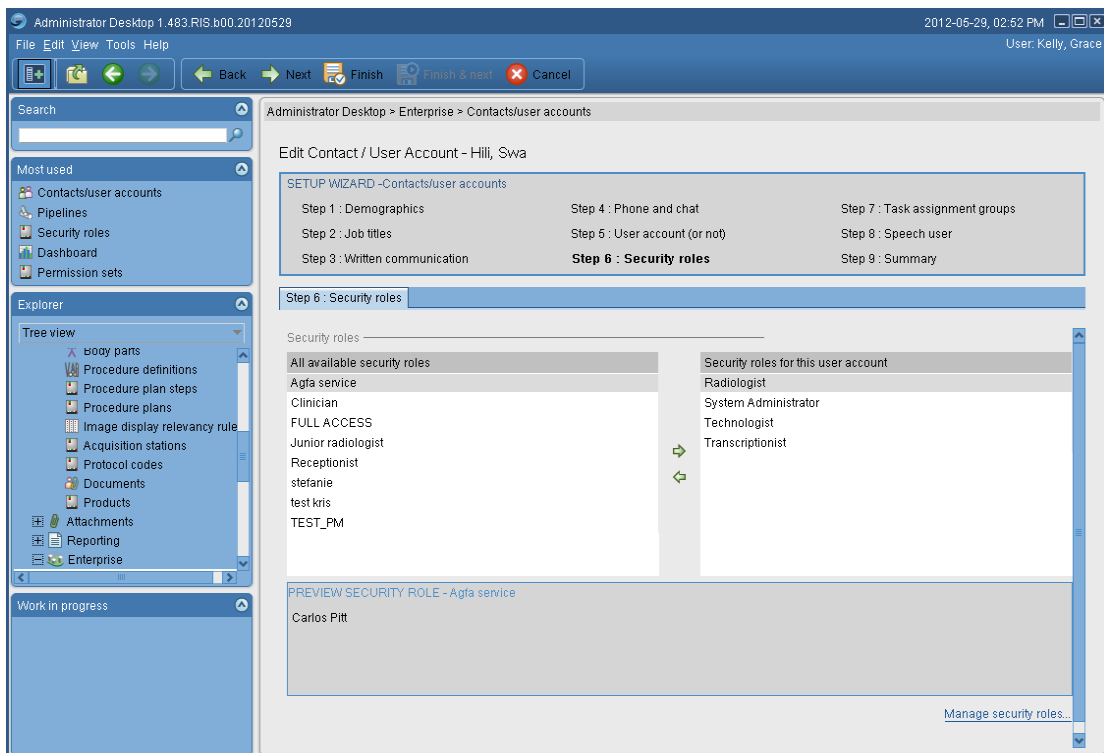
Search

Some users prefer a third way of navigating to the page they need: they search for it.

Wizards

For some setup objects the administrators need to bring many different pieces together. In the past these objects were configured in different tools. They have now been arranged into wizards. They lead the user through the interface step by step to do tasks in a prescribed order.

Examples: “Contacts/user accounts” and “Procedure plan steps”. For bulk setup an alternative tool is available.



Wizard – Contacts and users

Note on wizards

Wizards are not to be confused with the scripts in IMPAX 6 called “image wizards”. These are recorded sets of Image area actions. Some of them are applied automatically each time a study or patient is viewed, or the first time a study is viewed in a session. Others can be applied by selecting a tool or by pressing a keyboard shortcut.

Work in progress

Not only do Grace, Carlos and Ben need to find their way amongst numerous tools and setup categories, they also need a way to deal with interruptions. Their desktop offers an easy way of picking up work that was interrupted: the Work in progress pane. For Peter, who works with tasks, this pane was called “Started tasks”. Administrators don’t have tasks, their activities are called “work”.

Customized per user

The 3 personas use the same desktop but it is “customized” per user

- His choice of view is “sticky”, so he always start up with his favorite view.
- In addition each user get shortcuts to the items he uses most (in the “Most used” pane).
- Finally the desktop opens with the screen he was viewing when he closed it.

Other personas

The same care was taken to fulfill the needs of the other personas: Miranda, the transcriptionist, Sam, the technologist,... Starting with extensive task analysis, we proceeded with user testing prototypes and finished with field trials to optimize their interfaces.

8. Summary

The different desktops in Enterprise Imaging reuse the same components but changes have been made to fulfill the needs of the different personas. This will result in higher efficiency, productivity and job satisfaction. This is beneficial to the hospital, the patients and the users of the software.

Agfa HealthCare, a member of the Agfa-Gevaert Group, is a leading global provider of diagnostic imaging and healthcare IT solutions. The company has nearly a century of healthcare experience and has been a pioneer on the healthcare IT market since the early 1990's. Today Agfa HealthCare designs, develops and delivers state-of-the-art systems for capturing, managing and processing diagnostic images and clinical/administrative information for hospitals and healthcare facilities, as well as contrast media solutions to enable effective medical imaging results.

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