



Contract N° 257964

# **NANOTEC**

## **Ecosystems Technology and Design for Nanoelectronics**

Coordination Action  
Information and Communication Technologies

### **Deliverable No 6.5: “Yellow pages on Nanoelectronics in Europe to the public”**

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Start date of project: 1 September 2010

Duration: 30 Months

Organisation name of lead partner for this deliverable: edacentrum gmbH

Revision [ ]

#### **Approval**

<b>WP Leader</b>	<input checked="" type="checkbox"/>		<b>Coordinator</b>	<input checked="" type="checkbox"/>
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<b>Project co-funded by the European Commission within the Seventh Framework Programme (2007-2012)</b>		
<b>Dissemination Level</b>		
<b>PU</b>	Public	
<b>PP</b>	Restricted to other programme participants (including the Commission Services)	x
<b>RE</b>	Restricted to a group specified by the consortium (including the Commission	
<b>CO</b>	Confidential, only for members of the consortium (including the Commission Services)	

<b>Partner</b>	<b>Please, give a short description (1-3 sentences) of partners contribution to this deliverable</b>
ECN	Specified and programmed the “Yellow Pages” and took all effort to foster the Yellow Web Pages of Nanoelectronic technology for the European nanoelectronic technology landscape to the public
All partners	Help on the specification of the taxonomy and check and correction of the Yellow pages’ content and functionalities

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## **1. Aim of this study**

This document reports what has been done and achieved concerning this deliverable, which was to foster the ‘NANO-TEC Yellow Pages’ (YP) to the public.

## **2. Work performed**

The improved implementation of the ‘NANO-TEC-Yellow Pages’ (see first and second periodic report in Task 2.2) has been checked by all partners, who also inserted recent information and corrected the existing content again. ECN created a guideline document regarding how to deal with the YP which has been put onto the Yellow Pages homepage. Furthermore ECN wrote a press release concerning the opening of the Yellow pages to the public which has been revised by core project partners.

Finally the press release (see part 4 in this document) has been published by ECN while simultaneously several partners distributed the information via email to more than 4000 people in the communities of technology and design in nanoelectronics.

All experts from the communities of technology and design in nanoelectronics now have the opportunity to join, check and improve the YP. It has been observed that the access on the NANO-TEC website has risen after the press release and the mailing have been sent out but this has not been examined yet.

## **3. Guidelines: How to deal with the ‘NANO-TEC-Yellow Pages’**

### ***3.1. What the ‘NANO-TEC-,Yellow Pages’ are...***

The NANO-TEC project has established an information repository called ‘[NANO-TEC-Yellow Pages](#)’ (YP), which offers search for and access to experts, institutions, projects, working groups and results in the field of future nanoelectronics, as in Beyond CMOS, in Europe.

The European Commission ICT theme of the 7th Framework Programme is funding a Coordination Action project entitled "ECOSYSTEMS TECHNOLOGY and DESIGN for NANO-ELECTRONICS" (NANO-TEC, ICT-2010-257964). The project started in September 2010 and its aims are to identify the emerging generation of device concepts and technologies for ICT, as well as to build a joint technology-design community in order to coordinate research efforts in nanoelectronics in the European research area.

Therefore the NANO-TEC consortium has developed a state-of-the-art web platform for working groups, facilitating discussions, meetings, communications and recently offers access to an information repository called ‘[NANO-TEC-Yellow Pages](#)’ at [www.fp7-nanotec.eu/search\\_yp](http://www.fp7-nanotec.eu/search_yp). While the whole platform offers an interface to disseminate the project results to the public and to experts in the field, the “Yellow Pages” will help experts in nanoelectronics, who will gather in specialist groups, thus becoming a reference point to examine achieved results, existing competences and contact information in the field of future nanoelectronics in Europe.

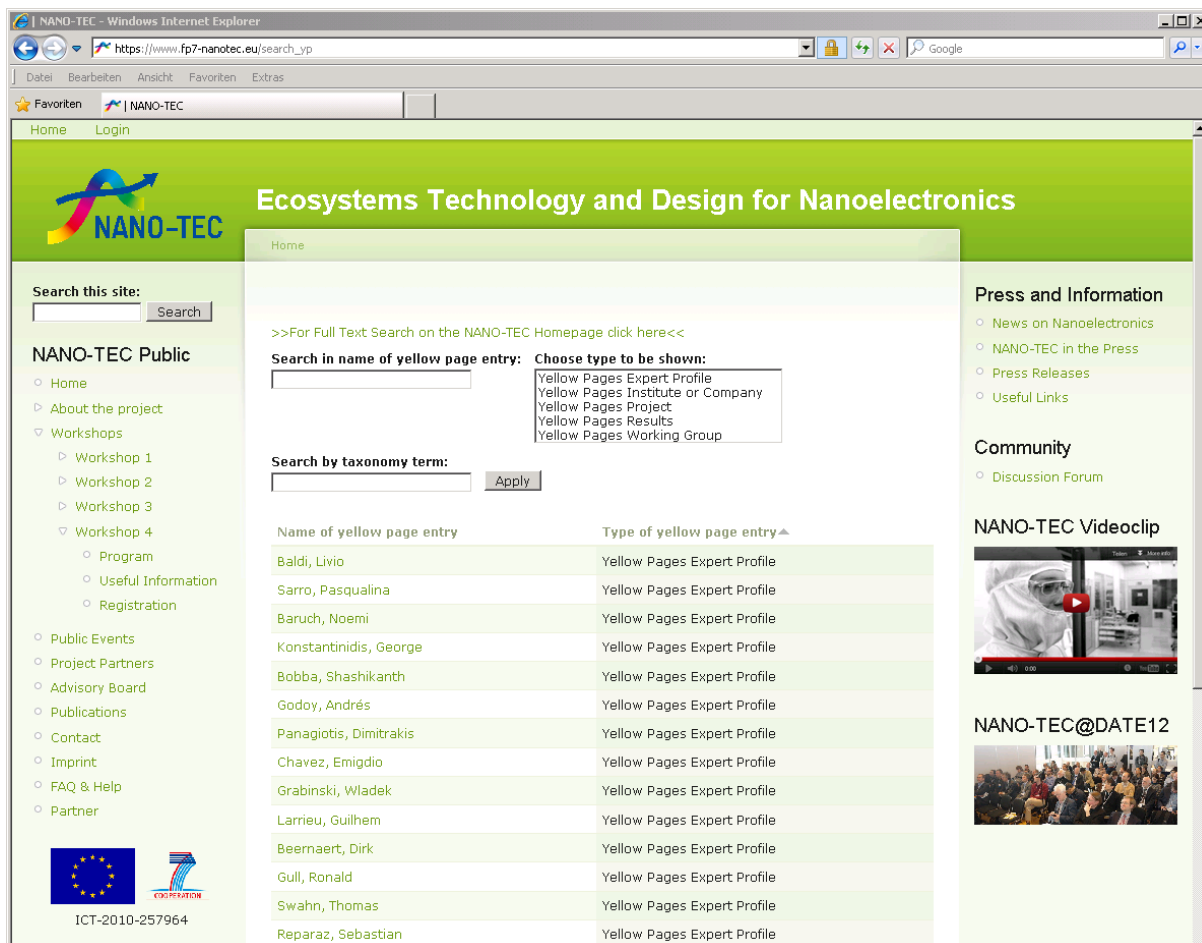
Within the YP the nanoelectronics technology specific content has been organized along categories such as ‘expert’, ‘institution’, ‘project’, ‘result’ and ‘working group’. Additionally, a five-level taxonomy of technical terms in micro- and nanoelectronics as well as in economy and funding has been defined. The YP’s taxonomy allows classifying semantically the YP’s categories. The following table gives an impression of the nanoelectronics part taxonomy spread only in two levels:

First Level	Second Level
Characterization	structural, electronic, optical, chemical, device, processes
Devices	Memories, Junction FETs, T FETs, X FETs, Photonics, Sensors, Nanowire FETs
Fabrication	Nanometrology, Beam-based, 3D Integration, self-assembly, heterogenous integration
Materials	Si, IV, III - V, Carbon, Polymers, Quantum Dots, Nanowires, Superconductors
Simulation & Modeling	Continuum modeling, ab initio / DFT, Monte Carlo, Molecular Dynamics
Theory	

**Table 1:** Nanoelectronics part of the YP's taxonomy in order to semantically classify the YP's categories. Categories and taxonomy have been implemented within the open source CMS system Drupal to form an information repository which enables the NANO-TEC web platform to store technical information in repositories in a structured and semantically order that can be used as Yellow Pages.

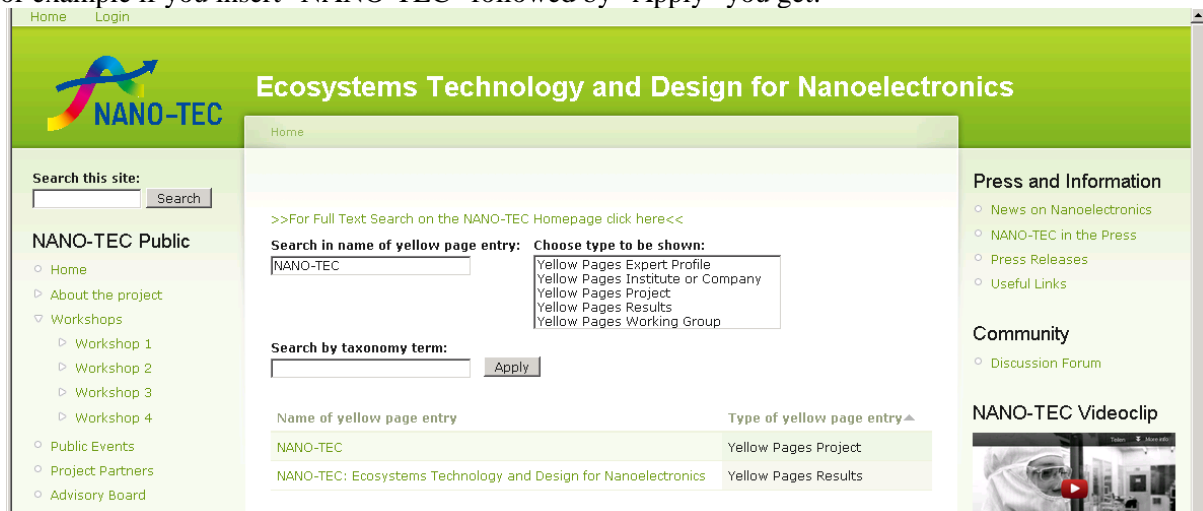
### 3.2. How to search in the NANO-TEC-, Yellow Pages' (YP)

- 1) At [www.fp7-nanotec.eu/search\\_yp](https://www.fp7-nanotec.eu/search_yp) you reach the first page of the NANO-TEC-, Yellow Pages' (YP), which is embedded in the NANO-TEC-Homepage:



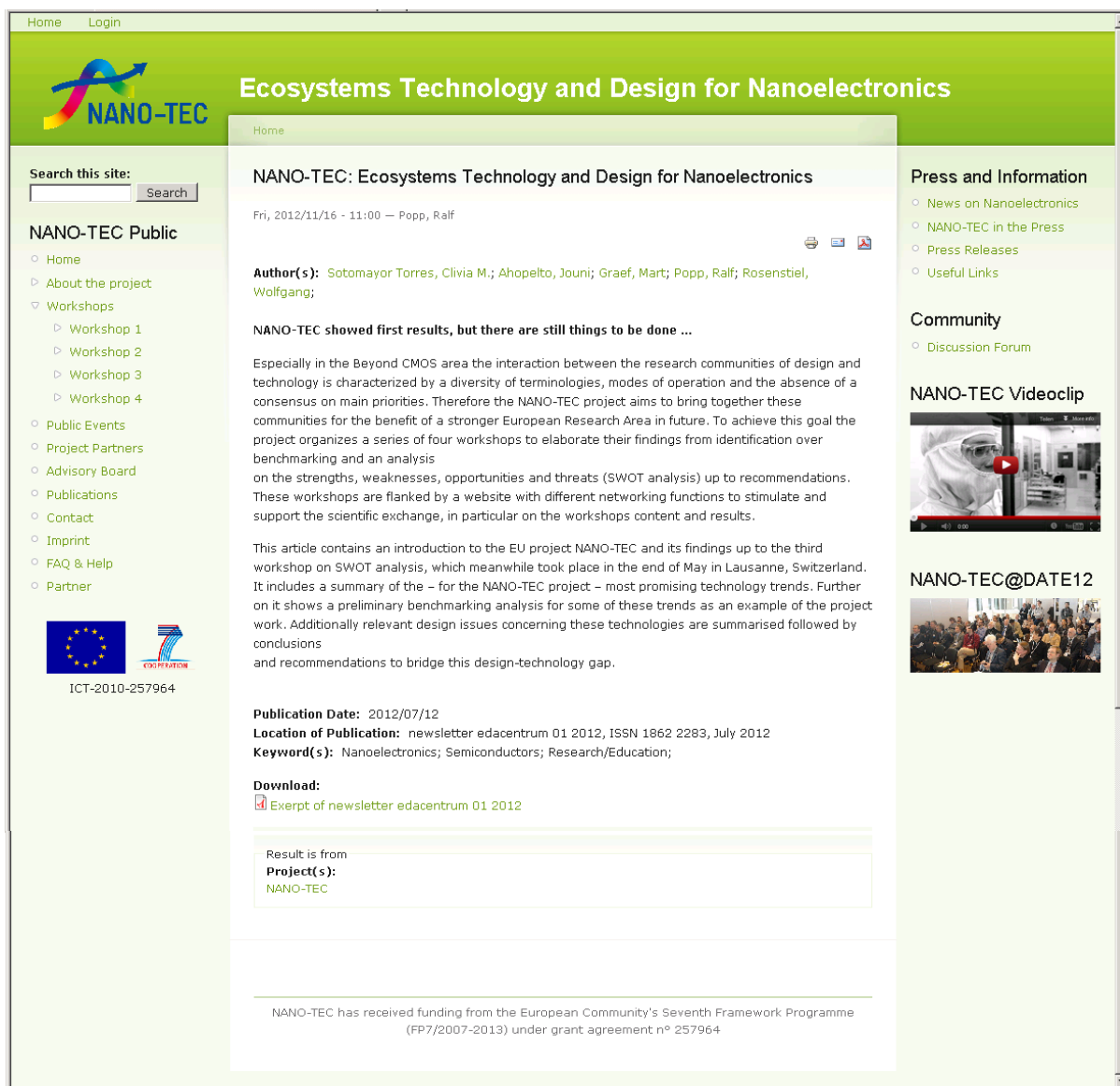
**Figure 1:** First screen of the NANO-TEC-, Yellow pages'

The NANO-TEC homepage is divided into four areas: title, a left and a right menu and the content. At the top of the content area a search mask with three fields is shown. A search can be performed on either the name of the YP entry or using the taxonomy terms. By pressing the “Apply” button, the specified search will be performed. To concentrate a search on a certain type of YP data the type can be chosen from a list. For example if you insert “NANO-TEC” followed by “Apply” you get:



**Figure 2: Result for a search on “NANO-TEC”**

The shown result comprises the NANO-TEC project and a result that came out of it. By clicking the result you get the following YP entry:



**Figure 3: YP entry of a result of the NANO-TEC project**

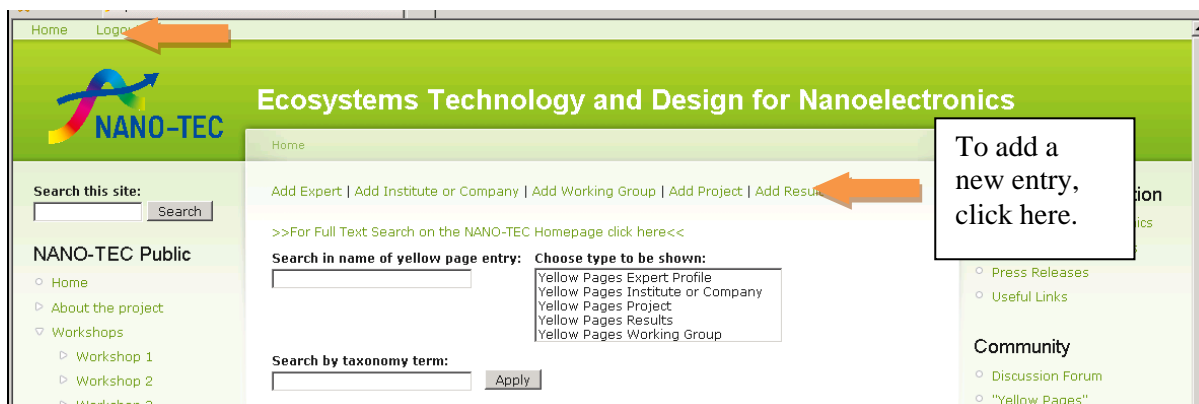
The content of the result comprises several fields, i.e., a title, authors, an abstract, the bibliographic data, a link to download the result and the link to the expert, the institution, the project or the working group to which the result is linked to in the YP data structure.

### ***3.3. How to insert new data in the 'NANO-TEC-, Yellow Pages'***

To insert data into the yellow pages you need to login or, if you are not registered yet, you need to register first. This can be done by clicking on the Link "Login" at the top of the page (see figure 4) and following the instructions given there.

Once you are logged in you will get a different screen at [www.fp7-nanotec.eu/search\\_yp](http://www.fp7-nanotec.eu/search_yp) where you find links on the top of the page which will enable you to add experts, institutions, projects, results and working groups (see figure 4):

To login or register, click here.

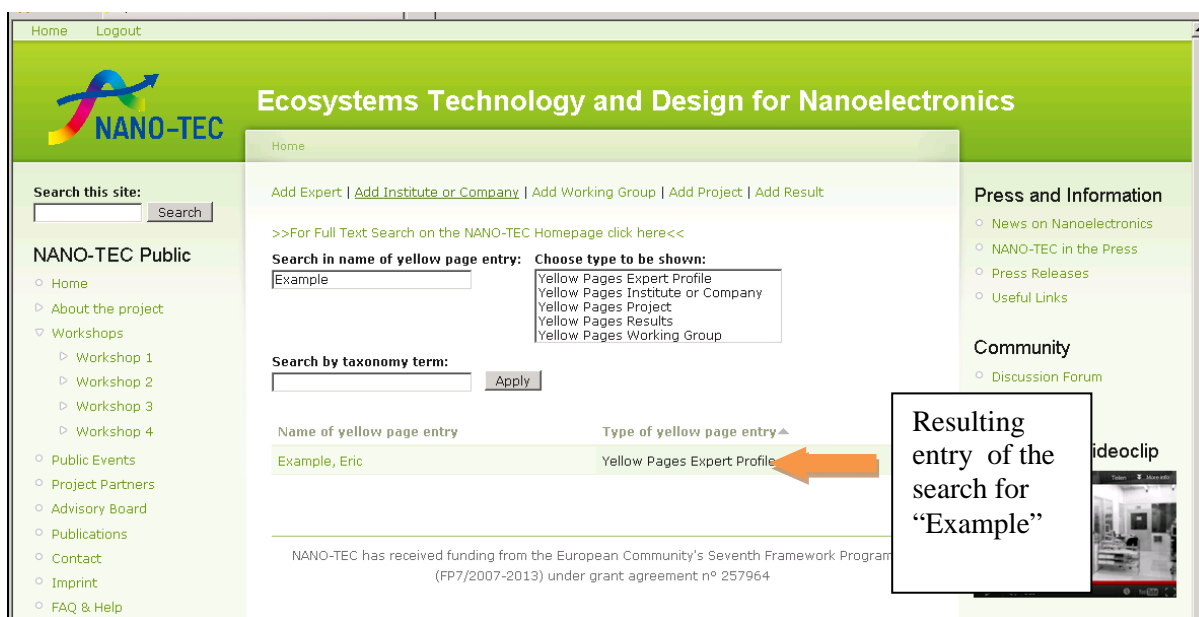


**Figure 4: Top of the YP homepage after login of a registered user**

The procedure to add new entries to the YP is near the same as to edit data and can be derived from the instructions of the following chapter, which describes how to edit existing data.

### 3.4. How to edit data in the 'NANO-TEC-,Yellow Pages'

To edit an entry you first have to find the data. Therefore perform a search as described above. For example if you are looking for an expert called Eric Example you have to type his name into the first field followed by clicking "Apply". Figure 5 shows what you will get:



**Figure 5: YP resulting from a search on "Example" in the "name" field of the yellow page entry**

The result of the search is an "Expert profile" of "Eric Example" which can be seen after clicking on it as shown in figure 6.

The screenshot shows the NANO-TEC website interface. At the top, there is a green header with the NANO-TEC logo and the title "Ecosystems Technology and Design for Nanoelectronics". Below the header, there is a navigation bar with "Home" and "Logout" links. The main content area displays the profile of "Example, Eric" with "View" and "Edit" buttons. Two orange arrows point to these buttons, with callout boxes explaining their function: "To edit an entry, click the 'Edit' here." and "Owner of the YP entry, who is allowed to edit." The profile details include: Title: Dr., First Name: Eric, Last Name: Example, Kind of Address: Headquarter Address, Position: Head of R&D, Address: Schneiderberg 32, Zipcode: 30167, City: Hannover, Country: Germany, Telephone: +45 511 762-19699, Email: example@edacentrum.de, and URL: edacentrum website. The left sidebar contains a search bar and a list of links under "NANO-TEC Public" and "Example". The right sidebar contains links under "Press and Information", "Community", and "NANO-TEC Videoclip".

Home Logout

**NANO-TEC**

**Ecosystems Technology and Design for Nanoelectronics**

Home

Example, Eric View Edit

Thu, 2012/11/15 - 14:54 — Example, Eric

**Title:**  
Dr.

**First Name:**  
Eric

**Last Name:**  
Example

**Kind of Address:**  
Headquarter Address

**Position:**  
Head of R&D

**Address:**  
Schneiderberg 32

**Zipcode:**  
30167

**City:**  
Hannover

**Country:**  
Germany

**Telephone:**  
+45 511 762-19699

**Email:**  
example@edacentrum.de

**URL:**  
edacentrum website



**Search this site:** Search

**NANO-TEC Public**

- Home
- About the project
- Workshops
  - Workshop 1
  - Workshop 2
  - Workshop 3
  - Workshop 4
- Public Events
- Project Partners
- Advisory Board
- Publications
- Contact
- Imprint
- FAQ & Help
- Partner

**Example**

- My account
- Create content
- Log out

   
ICT-2010-257964


**Press and Information**

- News on Nanoelectronics
- NANO-TEC in the Press
- Press Releases
- Useful Links


**Community**

- Discussion Forum
- "Yellow Pages"

**NANO-TEC Videoclip**



**NANO-TEC@DATE12**



**Figure 6: Top of the YP of the (fictive) expert “Eric Example” shows his contact details**

If you are the owner of an entry in the YP, which is shown on the top of the data (see figure 6) you are allowed to edit the entry, which can be done after clicking the edit button. The following figure shows the top of the edit page of Eric’s YP entry which shows several of the editable fields, in particular title, first name, last name and the taxonomy.

Home Logout

**Ecosystems Technology and Design for Nanoelectronics**

Home > Example, Eric

**Example, Eric** View Edit

**Title:**  
Dr.

**First Name:**  
Eric  
Contact Person's first name

**Last Name:**  
Example  
Contact Person's last name

**Yellow Pages Taxonomy:**  
<none> Add

All selections

Abstraction Level of Electronic Systems > Dataflow Level > Analog Mixed Signal	Remove
Abstraction Level of Electronic Systems > Device And Technology Level > Beyond CMOS	Remove
Abstraction Level of Electronic Systems > Device And Technology Level > MOS Technology	Remove
Abstraction Level of Electronic Systems > Electrical Level > Analog Mixed Signal	Remove
Conferences > DAC	Remove
Conferences > DATE	Remove
Design Automation Methodology > Implementation > Synthesis	Remove
Funding Information > Europe > FP7	Remove
Funding Information > Europe > ICT2020	Remove
Funding Information > Europe > JTI > ENIAC/AENEAS	Remove
Funding Information > Germany > IKT2020	Remove

Please note, that you can choose several Items of taxonomy one by one after each other.

**Search this site:** Search

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  - Workshop 2
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  - Workshop 4
- Public Events
- Project Partners
- Advisory Board
- Publications
- Contact
- Imprint
- FAQ & Help
- Partner

**Example**

- My account
- Create content
- Log out

**Press and Information**

- News on Nanoelectronics
- NANO-TEC in the Press
- Press Releases
- Useful Links

**Community**

- Discussion Forum
- "Yellow Pages"

**NANO-TEC Videoclip**

**NANO-TEC@DATE12**

**Figure 7: Top of the edit page of Eric Example's YP entry shows his title, name and taxonomy**

As taxonomy is the core information for the YP to organize the different entries with respect to their context, it is of an enormous importance. The taxonomy data of each entry allows to classify it within its scientific, technical, funding or management context. The insertion of the applicable taxonomy is very simple and self-explaining following the drop-down menu. Once you have chosen a first taxonomy term (i.e. "Simulation and Modeling") from the menu, a new drop-down menu appears which allows to classify the first term, as shown in figure 8:

**Yellow Pages Taxonomy:**

Simulation and Modeling Add

All selections

Abstraction Level of Electronic Systems > Dataflow Level > Analog Mixed Signal	Remove
Abstraction Level of Electronic Systems > Device And Technology Level > Beyond CMOS	Remove
Abstraction Level of Electronic Systems > Device And Technology Level > MOS Technology	Remove
Abstraction Level of Electronic Systems > Electrical Level > Analog Mixed Signal	Remove

**Figure 8: Illustration how to add a taxonomy term**

After choosing again a taxonomy term a further drop-down menu appears until the last level of the chosen taxonomy is reached. The choice of terms can be stopped by pressing the "Add"-button at any time, which leads to a new entry in the list of taxonomy terms shown below the drop down menu. Any entry can be removed again at any time as well as any choice can be changed before pressing "Add".

At this time it has to be indicated, that each change on the edit page has to be saved by pressing the "Save"-button at the bottom of the mostly very long page, before a change becomes valid.

If you scroll down along the edit page you will see other editable fields (s. figure 8), in particular fields to insert the applicable contact information, which can be split up to several addresses by clicking on "Add more values".

Example, Eric | NANO-TEC - Windows Internet Explorer

https://www.fp7-nanotec.eu/node/614/edit

Favoriten Example, Eric | NANO-TEC

ICT-2010-257964

Address

Kind of Address: \*  
Headquarter Address

Position:  
Head of R&D

Address:  
Schneiderberg 32  
Streetname e.g.

Zipcode: \*  
30167

City: \*  
Hannover

Country: \*  
Germany

Telephone:  
+45 511 762-19699  
Please enter your phone number like +49 511 76 21 84

Mobile:

Fax:

Email: \*  
example@edacentrum.de

URL Title:  
edacentrum website

URL URL:  
http://www.edacentrum.de  
URL to company or institute homepage

Add more values

**Figure 9: Editable fields to insert the expert's contact information**

After scrolling down along the edit page again you will see an area of editable fields allowing to insert different employments during the expert's curriculum vitae, which is shown in figure 9.

Example, Eric | NANO-TEC - Windows Internet Explorer

https://www.fp7-nanotec.eu/node/614/edit

Favoriten Example, Eric | NANO-TEC

Company / Institute:  
edacentrum GmbH

Department:  
R&D

Date  
Empty 'To date' values will use the 'From date' values.

From date:  
Year: 2002 Month: Apr

To date:  
Year: 2002 Month: Apr

Add more values

**Figure 10: Editable fields to insert the expert's employment information over the years**

The insertion of different employment institutions allows to link an expert to several companies or institutions without a conflict in the recent contact information. After inserting the current employment with the companies name from the drop-down menu, followed by a department and the time information of the employment, further employments can be inserted after clicking on "Add more values". In this context it has to be mentioned, that you can only chose those institutions from the "Company / Institute" drop-down menu that have been added to the YP first.

At the end of the edit page you will reach the area to insert and/or edit interests and a bio (in plain text) and the very important area of links to other YP entries like projects, results and working groups followed by the very important buttons to save, to preview or to view changes.

The screenshot shows a web browser window titled "Example, Eric | NANO-TEC - Windows Internet Explorer". The address bar shows the URL "https://www.fp7-nanotec.eu/node/614/edit". The page content includes a "Bio and Interests" section with a text area containing "Has some interests" and a prompt "Please fill in a written Biography and personal interests". Below this is a "Working in" section with two dropdown menus. The "Working Group(s):" dropdown is open, showing options: "- None -", "ENIAC Scientific Community Council", "Institute of Electrical and Electronics Engineers" (highlighted), and "International Roadmap Committee". The "Project(s):" dropdown is also open, showing options: "- None -", "FP7-ICT-NoE Nanofunction, Contr. No 257375", "NANO-TEC", and "R&D ACCESS". At the bottom of the form are three buttons: "Save", "Preview", and "View changes".

**Figure 11: Editable fields to insert the expert's interests and bio and the links to other YP content**

To edit YP data of other YP categories act according to the edit process of the expert.  
For questions please contact [yellow-pages@fp7-nanotec.eu](mailto:yellow-pages@fp7-nanotec.eu)

#### 4. Press Release

### Yellow Pages on European Competences in Future Nanoelectronics available

*NANO-TEC project helps to find experts, institutions, projects, and result in nanoelectronics*

**The NANO-TEC project announces its 'Yellow Pages' (YP) to be publicly available. The Yellow Pages comprise an information repository which offers search for and access to experts, institutions, projects, working groups and results in the field of future nanoelectronics, as in Beyond CMOS, in Europe.**

The European Commission ICT theme of the 7th Framework Program is funding a Coordination Action project entitled "ECOSYSTEMS TECHNOLOGY and DESIGN for NANOELECTRONICS" (NANO-TEC, ICT-2010-257964). The project started on 1st September 2010 and its aims are to identify the emerging generation of device concepts and technologies for ICT, as well as to build a joint technology-design community in order to enhance research efforts in nanoelectronics in the European research area. Therefore, the NANO-TEC consortium has developed a state-of-the-art web platform for working groups, facilitating discussions, meetings, communications and recently offers access to an information repository

called ‘NANO-TEC-Yellow Pages’ at [www.fp7-nanotec.eu/search\\_yp](http://www.fp7-nanotec.eu/search_yp). While the whole platform offers an interface to disseminate the project results to the public and to experts in the field, the “Yellow Pages” will help experts in nanoelectronics, who will be able to gather in specialist groups, thus becoming a reference point to examine achieved results, existing competences and contact information in the field of future nanoelectronics in Europe.

Within the YP the nanoelectronics technology specific content has been organized along categories such as ‘expert’, ‘institution’, ‘project’, ‘result’ and ‘working group’. Additionally, a five-level taxonomy of technical terms in micro- and nanoelectronics as well as in economy and funding has been defined. The YP’s taxonomy allows to classify semantically the YP’s categories.

Categories and taxonomy have been implemented within the open source CMS system Drupal to form an information repository, which enables the NANO-TEC web platform to store technical information in repositories in a structured and semantically order that can be used as Yellow Pages.

### **About NANO-TEC**

The EU FP7 ICT project NANO-TEC seeks to build a community of academic researchers in nanoelectronics, addressing specifically research in Beyond CMOS from the combined technology and design perspectives. A methodology for consultation and analysis of research needs and trends was developed. The main activity has been a workshop series with invited experts from academia research organisations and industry, preceded by a methodology contents preparation phase and subsequent analysis and documentation, both by the consortium. Apart of identifying main trends in Beyond CMOS devices and design, benchmarking and SWOT analyses were performed. The recommendations of these combined efforts will be made public early 2013.

NANO-TEC is led by the Catalan Institute of Nanotechnology and comprises 10 other partners who are the Valtion Teknillinen Tutkimuskeskus VTT from Finland, the German edacentrum and the Forschungszentrum Juelich GmbH, Chalmers Technical University of Sweden, the Polish Institute of Electron Technology, Delft University of Technology from the Netherlands, the Greek National Centre for Scientific Research “Demokritos”, Tyndall National Institute from Ireland, the Ecole Polytechnique Fédérale de Lausanne and the French Centre National de la Recherche Scientifique CNRS. The consortium is assisted by an Advisory Committee of global experts with representatives of CEA-LETI, IMEC, Politecnico de Torino and AENEAS-CATRENE, who have global expertise and strong links to industry. Thus, the findings and activities of NANO-TEC ensure a broad coverage of its topic at European level.

More details on the project can be found at the project website: [www.fp7-NANO-TEC.eu](http://www.fp7-NANO-TEC.eu)

### **Contact**

edacentrum GmbH,

Ralf Popp, [popp@edacentrum.de](mailto:popp@edacentrum.de), Tel +49 (511) 762 19697, Fax +49 (511) 762 19695

### **Pictures**

Logo and a Screenshot of the Homepage of the ‘NANOTEC Yellow Pages’:

### **Links**

[http://www.fp7-nanotec.eu/search\\_yp](http://www.fp7-nanotec.eu/search_yp) NANO-TEC-Yellow Pages  
<http://www.fp7-nanotec.eu> NANO-TEC project homepag

## **5. Conclusions and recommendations**

The NANO-TEC consortium has developed a state-of-the-art web platform for working groups, facilitating discussions, meetings, communications and recently offers access to the information repository called ‘NANO-TEC-Yellow Pages’ (YP) at [www.fp7-nanotec.eu/search\\_yp](http://www.fp7-nanotec.eu/search_yp). While the whole platform offers an interface to disseminate the project results to the public and to experts in the field, the YP will help experts in nanoelectronics, who will gather in specialist groups, thus becoming a reference point to examine achieved results, existing competences and contact information in the field of future nanoelectronics in Europe. Within the YP the nanoelectronics technology specific content has been organized along categories such as ‘expert’, ‘institution’, ‘project’, ‘result’ and ‘working group’. Additionally, a five-level taxonomy of technical terms in micro- and nanoelectronics as well as in economy and funding has been defined. The YP’s taxonomy allows to classify semantically the YP’s categories.

## **6. Bibliography**

NANO-TEC web page: [www.fp7-nanotec.eu](http://www.fp7-nanotec.eu)

NANO-TEC-Yellow Pages: [www.fp7-nanotec.eu/search\\_yp](http://www.fp7-nanotec.eu/search_yp)