

Euro-Biolmaging

Preparatory Phase II Project

D4.3 Report on Nodes operational costs/budget

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Abstract

One of the aims of WP4 is to support the individual Node Candidates, to individually analyze their costs for Node management and operation, and to provide an overview on technology costs across all EuBI Node Candidates to the EuBI partners. A first picture of the current situation has thus been taken by means of a survey. The data reveal costs currently charged to users by the Node candidates, and full costs calculated on the basis of a reference cost model. Differences have become evident regarding the costs for same technologies at the Node Candidates, and the results will be presented and discussed in the group of EuBI Node Candidates.

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1. Introduction

The open access to the technologies offered by Euro-Bioimaging Node Candidates implies that Nodes have to sustain some costs, which are strictly related to the user access. These include costs for staff, instrument time, upgrade and maintenance of equipment, running costs, training materials, consumables, supporting facilities (i.e. animal houses, cell culture services). The user access costs are requested to be covered by the users in different extent at the different Node Candidates, also depending on other available funding resources (financial support for some Node Candidates currently comes from funding by the Euro-Bioimaging Member States and regional, national and European research funding mechanisms).

One of the aims of WP4 is to support the individual Node Candidates to analyze their real costs for Node management and operation. A first picture of the current situation has thus been taken by means of a survey, which will be described in the present report. In the future, Nodes shall continuously track all the costs related to the EuBI access and periodically report to the Hub for further assessments.

2. User access cost model

The cost model implies that the total user access cost will be the sum of three contributions: one from the technology itself, one from specific extra-consumables that will be used during the access, and one from any other additional service(s) the user will need.

The costs for extra-consumables and additional services may vary to a large extent depending on the users' needs for their specific projects. These costs should be evaluated by the Node Candidates on a case-by-case basis before the access and agreed directly with the users. A template for the "quotation" of the access including additional services and extra-consumables has been provided to Node candidates (attachment 1).

Contributions to the technology full costs are:

- 1) Initial equipment cost, amortized for the years of usage (we assume that 5 years is a reasonable time for imaging technologies);
- 2) Upgrade costs;
- 3) Costs for staff dedicated to that specific technology;
- 4) Instrument maintenance costs;
- 5) Other costs related to the operation of the infrastructure (water, energy, air conditioning etc.), weighted for the technology occupancy of the infrastructure.

Specific instrument maintenance and operational costs of the infrastructure are included in "indirect costs" and are calculated as 10% of total direct costs for the technology.

The full cost per hour for a given technology will be given by the sum of the above contributions, as follows:

$$\text{Instrument cost amortization} = \text{Instrument initial cost} / 5$$

$$\text{a) Total instrument cost per year} = \text{Instrument cost amortization} + \text{Instrument upgrade costs per year}$$

$$\text{b) Staff cost (per year)}$$

$$\text{c) Indirect costs (rent of space, energy, water, air conditioning, instrument maintenance, etc.) per year} = 10\% \text{ of } (a+b)$$

$$\text{Final technology cost per hour} = (a+b+c)/(\text{working days} \times \text{working hours}), \text{ with average values of 220 days and 7 hours/day} = 1540 \text{ hours/year}$$

The cost model has been presented during the first meeting of Node candidates representatives (Heidelberg, 10/6/2016) to receive their feedback about it. Of course, each facility uses its own cost model to evaluate the user access cost and determine the user fee (if any), and some doubts have been

expressed about the chosen amortization period (many facilities use longer periods), the used average number of working hours and the way indirect costs are evaluated. Anyway the cost model described herein is considered adequate to be used as a common reference to take a picture of the current situation of Node candidates' costs, to compare costs applied by different facilities and identify any obvious discrepancies.

3. Survey on Nodes' user access costs

Each Node candidate has thus been invited to answer to a questionnaire based on this model (attachment 2). For Biological Imaging Node candidates, costs could be indicated as average values among different groups of technologies. Node candidates were also requested to indicate which additional services they offer.

All the 29 ratified Node Candidates answered the questionnaire.

The average values for full and charged costs for each group of technologies, together with minimum and maximum values, are reported in table 1 and figure 1.

The cost model does not fit well the type of costs sustained by Nodes that offer non-physical user access (two Population Imaging Node candidates, one Challenges Framework). These Node candidates have completed the questionnaire by indicating the total initial investment in terms of IT equipment and the staff costs, but the resulting costs per hour can be considered only indicative and for this reason they have not been included in the table and graph. The collected information is still of importance for future funding requests.

	Min	Max	Average	Average full cost	N (# of Node Candidates)
ALM	5,00 €	179,33 €	41,33 €	87,06 €	16
Super Resolution	5,00 €	68,73 €	41,60 €	120,69 €	11
Functional Imaging	5,00 €	60,00 €	31,01 €	120,29 €	5
HTM	5,00 €	50,00 €	29,16 €	97,17 €	6
EM	25,00 €	123,80 €	69,04 €	169,33 €	7
CLEM	36,00 €	140,00 €	70,79 €	172,21 €	5
Mesosopic Imaging	12,00 €	35,00 €	23,50 €	54,50 €	2
	Min	Max	Average	Average full cost	
(micro)CT	142,00 €	165,00 €	153,50 €	154,35 €	2
Phase Contrast Imaging				228,57 €	1
(micro)MRI (low & high field)	100,00 €	312,00 €	179,98 €	267,74 €	6
(micro)PET & SPECT	90,00 €	165,00 €	124,40 €	135,43 €	4
(micro)PET/CT & SPECT/CT	142,00 €	185,00 €	158,75 €	158,08 €	3
(micro)PET/MRI	227,00 €	227,00 €	227,00 €	229,00 €	1
(micro)US	32,00 €	100,00 €	67,20 €	69,00 €	3
OI	39,00 €	117,00 €	77,67 €	72,91 €	4
PET/CT human	397,00 €	611,00 €	504,00 €	298,14 €	2(*)
PET/MRI human (#)	879,00 €	879,00 €	879,00 €	819,78 €	2
SPECT/CT human	170,00 €	170,00 €	170,00 €	171,00 €	1

Table 1 – (*):one of the two Node Candidates wishing to offer human PET/CT has included extra costs (costs for patients' management and post-processing/image analysis) in the charged cost. (#):one of the two Node candidates wishing to offer human PET/MRI has calculated the full cost but has not established the fee to be charged to users yet: for this reason the reported average full cost (average over 2 facilities) appears lower than the average charged one (only one facility).

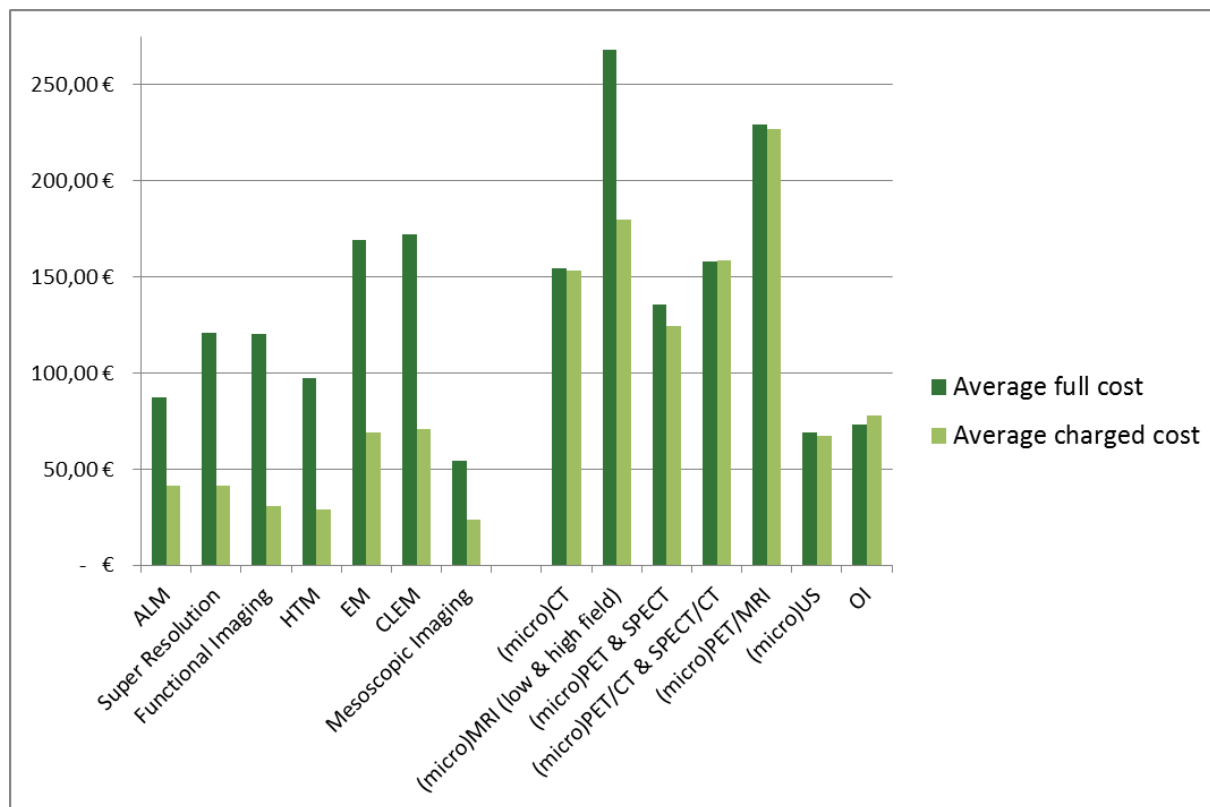


Figure 1

Average full and charged costs.

In general, there are variations between the calculated full costs and the costs currently charged to users by the Node Candidates. This is more evident for Biological Imaging Node candidates.

For some of the Node Candidates, part of the costs are covered by other funding resources, and for this reason the “fees” for user access are lower than the indicated full costs.

In other cases, the differences can be explained on the basis of different cost models used locally by the Node Candidates to calculate their costs, e.g. relying on longer amortization periods or not considering the initial investment for the instrument but only subsequent upgrades: in these cases the charged costs result to be lower than the calculated full costs.

All these cases can be considered “physiological” and do not need any further action at the moment.

Some Node Candidates currently could not indicate any cost charged to the users (only full costs of these Node Candidates have been included in the averages), partly because they did not host any external user from EuBI and/or have not decided on their applied fee yet.

Some Node Candidates apply different rates to industries and public research institutions.

Individual charged costs.

As shown in table 1, there is quite a great variability in costs charged to users among Node Candidates. This is especially true for biological imaging technologies, but it must be taken into account that the data provided in this survey comprise many different biological imaging technologies, which have been grouped here in order to simplify the picture. A much more detailed survey with very strict requirements on the format of feedback and one-to-one interviews with each participating Node Candidate will be required for future cost analysis of individual imaging technologies.

Furthermore, variations can be considered reasonably acceptable as they rely on the local cost models used, or, even more simply, on the physiological differences among countries (i.e. salaries, existing financial support for the technology platform, etc.) or on the use of different machines for the same

technology. In the latter case, users may decide for example to spend more to have access to the more performing instrument, or to spend less if they just need to use a particular technology at a routine level. The information for this choice is available at the Node Candidates' webpages on the EuBI Web Access Portal, where some description of Nodes' specialties and excellence has been inserted, and/or at the Nodes' own websites.

4. Conclusion

The costs analysis has evidenced some differences between the full costs calculated on the basis of the common cost model and the costs currently charged to user by the Node Candidates, which can be considered acceptable on the basis of the different national realities and/or types of instruments used at different facilities. The cost model thus appears to fit quite well the Euro-BioImaging reality and may be used for future discussion with funders.

Variations in applied fees among Node Candidates have also been evidenced. Future harmonization is per se desirable, but there are no plans to pressurize any facility to change user fee policies. Although charged costs vary among Node Candidates, EuBI Hub and Node Candidates themselves are confident that users will base their preference for working at a certain facility on expertise and excellence rather than on the costs charged to the user. As a general principle, Euro-BioImaging encourages collaboration and discourages "price competition".

Attachment 1: user access quotation template

EuBI Node Candidate quotation for user access

Name of Node Candidate: _____

Country: _____

EuBI Application number: _____

Name of User: _____

1) Technology cost.

Technology: _____

Expected hours of usage: _____

Technology cost per hour: _____

Total technology cost: _____

Technology: _____

Expected hours of usage: _____

Technology cost per hour: _____

Total technology cost: _____

Technology: _____

Expected hours of usage: _____

Technology cost per hour: _____

Total technology cost: _____

Technology: _____

Expected hours of usage: _____

Technology cost per hour: _____

Total technology cost: _____

2) Additional Services.

Type of Service: _____

Expected hours of usage: _____

Service cost (per hour): _____

Total cost for service: _____

Type of Service: _____

Expected hours of usage: _____

Service cost (per hour): _____

Total cost for service: _____

Type of Service: _____

Expected hours of usage: _____

Service cost (per hour): _____

Total cost for service: _____

3) Extra Consumables.

List of required consumables:

Total consumables cost: _____

TOTAL EXPECTED COST (1+2+3): _____

COST TO BE COVERED BY USER: _____

Attachment 2: questionnaires for survey on user access costs

QUESTIONNAIRE A - Molecular/Medical Imaging Node Candidates

Please fill-in green and yellow fields in both the questionnaire sheets. Values in grey columns are automatically calculated: please don't write in grey columns

Feel free to add lines where needed.

User access cost.

1) Please indicate the following costs PER TECHNOLOGY (in €)

Technology	Costs calculated according to the proposed cost model (see attached)					Cost currently charged to the user	Maintenance costs per year ²
	Instrument initial investment cost ¹	Cost of staff dedicated to technology (per year) ¹	upgrade costs in the last five years ¹	Indirect costs (per year) ¹	Cost per hour	Cost per hour	
.....				0,00	0,00		
.....				0,00	0,00		
.....				0,00	0,00		
.....				0,00	0,00		
				0,00	0,00		
				0,00	0,00		
				0,00	0,00		

2) Please indicate your Infrastructure operational costs (rent of space, water, electricity, air conditioning etc) per year (in €):²

2b) If available, please indicate the extension of your Node Candidate facility (in m²):²

[1] The data are used to calculate the technology cost per hour (TCH), according to the attached cost model.

[2] According to the cost model, the maintenance and infrastructure operational costs are considered within the indirect costs, that are calculated as a lump sum (i.e. 10% of direct costs). Although infrastructure operational costs are not used explicitly to calculate the technology cost, please fill in this field to help us evaluate if our cost model is consistent with actual costs.

3) Please list any additional service you will offer (cost to be determined on the basis of the specific user's requests):

MRI Contrast agents – commercial	Yes/no
MRI contrast agents – custom synthesis	Yes/no
Radiotracers – commercial	Yes/no
Radiotracers – custom synthesis	Yes/no
Fluorescent dyes – commercial	Yes/no
Fluorescent dyes – custom synthesis	Yes/no
Other probes (please specify)	Yes/no; if yes: list of probes
Animal models – from repository	Yes/no
Animal models – custom models	Yes/no
Animal house	Yes/no
Cellular models	Yes/no
Image processing and analysis	Yes/no
Other (please specify)	list of other offered services

4) Please describe the main funding resources available to your Node Candidate to support user access.

5) On the basis of the financial resources available to support the Node Candidate operational costs, please indicate which percentage of the user access costs (evaluated as the sum of the cost per technology, extra-consumables and additional services) can be sustained by the Node.

..... %

QUESTIONNAIRE B - Biological Imaging Node Candidates

Please fill-in green and yellow fields in both the questionnaire sheets. Values in grey columns are automatically calculated; please don't write in grey columns
 Feel free to add lines where needed.

User access cost.

1) Please indicate the following costs averaged across available technologies in your facility (in €):

Technology group n.	Technologies included in the group	Costs calculated according to the proposed cost model (see attached)					Cost currently charged to the user	Maintenance costs per year ²
		Instrument initial investment cost ¹	Cost of staff dedicated to technology (per year) ¹	upgrade costs in the last five years ¹	Indirect costs (per year) ¹	Cost per hour	Cost per hour	
1					0,00	0,00		
2					0,00	0,00		
3					0,00	0,00		
4					0,00	0,00		
....					0,00	0,00		
....					0,00	0,00		
....					0,00	0,00		

2) Please indicate your Infrastructure operational costs (rent of space, water, electricity, air conditioning etc) per year (in €):²

2b) If available, please indicate the extension of your Node Candidate facility (in m²):²

[1] The data are used to calculate the (averaged) technology cost per hour (TCH), according to the attached cost model.
 [2] According to the cost model, the maintenance and infrastructure operational costs are considered within the indirect costs, that are calculated as a lump sum (i.e. 10% of direct costs).
 Although infrastructure operational costs are not used explicitly to calculate the technology cost, please fill in this field to help us evaluate if our cost model is consistent with actual costs.

3) Please list any additional service you will offer (cost to be determined on the basis of the specific user's requests):

Cellular models	Yes/No
siRNA	Yes/No
Other (please specify)	Yes/No; if yes, please list other services

4) Please describe the main funding resources available to your Node Candidate to support user access.

5) On the basis of the financial resources available to support the Node Candidate operational costs, please indicate which percentage of the user access costs (evaluated as the sum of the cost per technology, extra-consumables and additional services) can be sustained by the Node.

.....%