

Response to report based on internal evaluation of CFs - CEITEC 2017.

Multimodal And Functional Imaging Laboratory – MAFIL

There is persistent different view on the number of FTE and structure of FTE between evaluation board (recommendation is to decrease overall FTE) and MAFIL representatives + relevant CF boards (do not decrease FTE, or even increase FTE in the case of significant increase of utilization). There are many reasons why CF MAFIL cannot operate with the similar structure (including staff) like biological facilities.

The main reasons are:

- 1) specific requirements for working with humans and for the status of healthcare service provider
- 2) strong interdisciplinary character with high diversity and complexity of services (and relevant activities)

We address these points more in details.

Specific requirements for working with humans and for the status of healthcare service provider

Rules for scientific operation of MRI labs – each scanner should be operated by 2 or more operators/researchers (both practical and safety reasons). There are three modes (2 CF operators; 1 CF operator + 1 trained researcher; 2 trained researchers + CF technical support nearby). Second option mentioned is most typical. For some external users it is necessary to use first option. Third option is very rare as it requires very high skill of technical knowledge for possible users.

There are two busy MRI labs (two MRI scanners), single EEG lab and other electrophysiological labs mostly operated directly by users (CF ensure only basic technical support). Because EEG utilization is lower than MRI, at least 2.5 FTE is required to operate these 3 firstly mentioned labs (we do not take into the account holiday, illness and occasional requirement of usage only CF staff for measurements). Therefore 2.5 FTE and 3 persons is lower limit for standard workload operation. Higher utilization require increase in FTE and headcount. Except the standard measurements, skilled operators sometimes participate on preparation of new studies, training of users (each researcher in lab has to be trained due to safety requirements, even if he/she does not measure alone), cleaning of labs (MRI examination rooms and technical rooms are not accessible to external cleaning company).

Dealing with incidental findings – in case of suspicion to any pathology in human tissue, it is necessary to describe an image by (certified) radiologist. It requires at least one person and e.g. 0.2 FTE.

Healthcare service provider – we have to fulfill several criterions. One of them is to have guarantee for each medical profession (radiology, neurology, psychiatry, clinical psychology, ...). Even if some of the mentioned professions could be represented by researchers from neuroscience center, it is necessary to ensure the minimal working contract for the persons belonging to the rest of professions (typical the external ones) within CF. This is the case for radiologists (MD) and radiological assistants (certified technicians). Therefore, there are minor requirements for FTE (typically only DPP with few hours per week), but it increases the headcounts and decreases the ration between FTE and headcounts.

Dealing with data – we are working with sensitive personal data which brings several requirements about data handling policy, user access to databases, serves for data processing, etc. For example, all measured data have to be anonymized and provided to researchers in this way. Researchers can have access only to data from study/project they are belonging to. This cause the necessity of IT position (1FTE) and relatively extensive administration (managed partially by CF head and mostly by specific administrative person (about 0.7 – 1 FTE).

Strong interdisciplinary character with high diversity and complexity of services

The diversity and complexity of services is presented in following table. Many services require cooperation between several professions, see matrix representation below.

		Technicians / operators	MR physicists / MR specialists	Electrophysiological specialists, biomedical engineers	Radiologists	Programators, data analysis specialists	IT specialist	Management and administrative support
Data acquisition	MRI measurements	●						
	EEG measurements	●		●				
	Simultaneous MR/EEG/ExG meas	●		●				
	Technical support to rTMS and other electrophysiology			●				
Preparation for acquisition	Preparation of data acquisition	●	●	●				
	Programing of stimulation script for fMRI					●		
	Specific implementation of new HW/SW according to customer's requirement		●	●		●		
	Complex study preparation		●					●
Data processing	Data conversion/export into requested format			●		●	●	
	Preprocessing, advanced data processing, ...					●		
	Programming of processing pipeline					●		
	Consultation and technical support with respect to data processing ¹⁾			●		●		
	Medical description of data (dealing with incidental findings)				●			
Training	Training for usage of labs and equipment	●	●	●				●
	Training for data processing and planning studies		●	●		●		●
Other activities	Manage measured data, user access, database, etc.						●	
	Complex communication with users							●
	Evidence of projects, users, measurements and solving all administrative issues							●

Note 1) Relevant only if researchers do data processing themselves (typical for internal neuroscience researchers)

As you can see, CF MAFIL provide services related mainly to data acquisition, preparation of studies, data processing, and training. And there are other activities bounded to operation of CF. Because of strong interdisciplinary character, it is not possible to offer only routine measurement. There is wide range of users/researcher regarding their experience and know-how. Many of them (especially newcomers and external users) require help with planning of study, finding suitable measurement protocol, and either data processing or training in data processing and subsequent ongoing consultation and support in this field. Almost all internal neuroscience users do the processing themselves but they require initial training, help with programming of processing pipelines and other technical support. Some operation with electrophysiological data (e.g. correction of artifacts from simultaneous EEG-fMRI acquisition, processing of simultaneous ECG/breathing data) require specific software installed and licensed only at specific CF computers and/or specific expertise and such preprocessing has to be done by CF staff only.

Specific settings, testing and preparation of both MRI and electrophysiological devices are done by MRI specialists and physicists (in case of MRI) or electrophysiological/biomedical engineers (in case of EEG and other electrophysiology and shielded rooms). These people help with electrophysiological data handling (this has to be done manually in contrast to MRI PACS architecture) and checking of the quality of electrophysiological data. There is not any regular external service for electrophysiological devices and labs (unlike to regular service for MRI scanners) and all maintenance has to be done by CF staff.

Many projects require specific hardware or software solutions (e.g. MR compatible buttons, connection and synchronization between two devices, implementation of new MRI sequences, ...) which cannot be managed by users but have to be managed by highly experienced staff knowing the devices, specification and various regulations. Therefore, many issues have to be resolved and carried out by combination of MR physicist/specialist, electrical/biomedical engineers, programmers and radiologists.

This wide range of professions and expertise required to full operation of CF is partial reason for non-optimal ration between FTE and headcount – some very skilled persons want to do (or even have to do) own research and are partially involved in CEITEC research groups or external institutions. Thus, we will try to continue on improvement of this FTE/headcount ration but there are limits to this process.

Conclusion:

It is not possible to decrease FTE without negative impact on CF operation and/or quality of services provided by CF. We are continuously trying to improve FTE/headcount ration and separation between RG and CF but there are some limits to these processes, thus only minor changes can be expected in short time.

Finally, we want to emphasize that CF evaluation board consist of member without direct experience in the field of human neuroimaging. Probably this can be reason that we feel the effort to have simple and unique structure of all CFs at CEITEC and the model is probably more oriented to some

biological laboratories rather than human medically/psychologically oriented labs and thus not suited well for human neuroimaging lab. The members of scientific board and programme board (user committee) expressed support to our view. Because there will be probably ongoing discrepancy between our view and the opinion of evaluation board, we would like to suggest to incorporate another member experienced in the field of human neuroscience laboratories.