A Performance-based Management Model and its Application

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Abstract

Outstanding professional standards, efficiency of delivery and continuous faculty advancement are the key determinants of any academic institution's sustainability and improvement. This paper describes the design and implementation of a performance management system set up to achieve these goals at the CTU MIAS School of Business upon its reorganization and objectives reassessment in 2015. The Key Performance Areas in the underlying quantitative model include teaching-related results, as well as those for research and internationalization. The system couples directly to the performance-related segment of remuneration and deliberately omits soft assessment factors whose management remains the responsibility of department heads. Post-implementation results suggest a significant restructuring impact and capability to induce behavioral change, as well as strong attraction for high achievers, making it a tangible competitive advantage in the search for academic talent.

Keywords: performance measurement, KPI indicators, academic management, organizational change

Introduction

The MIAS School of Business (MIAS) is a unit of the Czech Technical University in Prague (CTU). Alongside the eight Engineering Faculties of CTU, MIAS - established in 1992 - focuses on business and economics, as well as interdisciplinary studies including languages, regional development, engineering pedagogy and history. To-date, it has cca 1,400 enrolled students in accredited undergraduate and post-graduate programs and over eighty in-house teaching and research staff.

At its inception, MIAS did not strive to develop full research and teaching capacities that would embrace the full scope of scholarly activities, outsourcing the production of its study programs as well as the teaching of essential courses to externs from other CTU faculties, the University of Economics and the Academy of Sciences. In-house academic

staff mainly provided organizational and study support and taught non-essential courses. At the time, the strategy had some justification because, as relics of politically-motivated reorganizations of academic institutions following World War II (Connelly, 2008; Stellner and Szobi, 2013), several CTU Faculties still maintained their own departments and study programs dedicated to sectoral economics, and such outsourcing avoided resources dilution.

More recently, however, it became clear that such a policy was not tenable, due in part to repeated censure by the national accreditation authority (AK, 2016a), but also its incongruity with the long-term strategy endorsed by CTU. A completely new management team installed in 2015 was therefore charged with the transformation of MIAS into a standard, effective and properly staffed academic entity. This paper introduces a new and innovative performance-management and remuneration system, developed and implemented as a key component of this endeavor in order to achieve its main objectives and secure enduring personnel stability at MIAS.

Background Research

Measurement of Academic Performance

Early attempts to assess of higher education institutions based on quantitative measures have been undertaken since the mid-Twenties, when pioneering studies based on reputation assessments by expert panels appeared in the United States (Cartter, 1966). Much more comprehensive research, albeit similar in nature, has been undertaken by the American Council of Education in the Sixties and Seventies, and by the National Research Council and certain media outlets in the Eighties (Brooks, 2005; Ostriker and Kuh, 2003). At that point of time, the first attempts were made to include some quantifiable criteria; nonetheless, their actual contribution to the predicative value of such assessments was contentious (Austin, 1985). Many years later, Stake (1999) responded to an inundation by meaningless rankings, declaring that "assessing education well may depend on assessing it less".

Incidentally, at the same time academia became heavily involved in the development of various corporate management theories and performance assessment systems, including Management by Objectives (Drucker, 1954), Total Quality Management (Deming, 1986) and Balanced Scorecard (Kaplan and Norton, 1992). In due course, these brought about revolutionary changes in the management of companies, and ultimately even public administration (Wren and Bedelan, 2008). Strikingly enough, they remained neglected by the academic community as a potential tool for managing themselves (Birnbaum, 2000).

If any reasons at all were offered to explain such a discrepancy, they included purported complexity, ill-defined stakeholder structure, or vaguely stated missions of academic institutions (Burke and Minassians, 2002a). Cohen and March (1974) actually characterized them using the term "organized anarchy", emphasizing that this does "...not make the university a bad organization or a disorganized one, but [makes] it a problem to describe, understand, and lead."

In the Nineties, some of this reluctance has been overcome by the increasing demand of accreditation authorities for measurable output indicators. Only then did focus start to shift from elementary quantifications of resources, such as the numbers of library books, entry exam statistics, faculty characteristics or monetary indicators of research grant support, to more sophisticated assessment systems. Nonetheless, this process still has a long way to go towards satisfactory sytem-relevant outcomes, be it because of ambiguous visions and objectives of various academic institutions, difficult quantification of research outputs, bureaucratic obstacles, aversion to change, or a reluctance to assume personal responsibility (Carey, 2007; Lane, 2007; Kelderman, 2012).

KPI Method Characteristics

In most other domains, academia aside, Key Performance Indicators (KPI), defined by Parmenter (2010, p. 4) as "a set of measures focusing on those aspects of organizational performance that are the most critical for the current and future success of the organization", have long become common and essential instruments for managing performance in organizations. They should be measured frequently and tie directly to the success of an organization. Parmenter (2010) describes KPI usage in more detail, but, generally, speaking, they should meet the S.M.A.R.T. objectives-setting criteria (Doran, 1981), i.e. being specific, measurable, assignable, realistic and time-related. The system is usually developed in a top-to-bottom manner, based on the corporate vision, mission, strategy and specific objectives of the budget period (normally 12 months), which leads to definition of the appropriate Key Performance Areas (KPA) and Key Performance Indicators on all levels of management.

The only established accreditation system that explicitly promotes the use of KPI for the management of higher-education institutions is the Academic Quality Improvement Process (AQIP), launched in 1999 and based on Total Quality Management principles, but even it offers no guidance for actual application related to academic staff management or to direct institutional comparison (Arif and Smiley, 2004). In fact, based on their comprehensive study of existing programs, Burke and Minassians (2002b, p. 122) suggested institutions "avoid mandated-prescribed programs, where legislation not only mandates the policy but also prescribes the indicators."

Some countries including the United Kingdom and Canada mandate KPI usage for their colleges and universities, defining them in very broad terms only (Breakwell and Tytherleigh, 2010, Conlon, 2004). Nevertheless, significantly, Conlon (2004) stressed that indicators used for the management of academic institutions should be constructed so as to have a direct effect on their core budgets.

In the Czech university environment, a quantitative evaluation model for academic staff has been conceptually designed in 2006 and subsequently tested since 2010 at the Faculty of Science of the Palacký University in Olomouc (Stoklasa et al., 2011). In comparison with the system introduced herein it is much more complex and stresses application of statistical methods, such as fuzzy sets, which, among other factors, contributed to its

lengthy implementation which has still not been finalized in any organization (Holeček et al., 2016). A much simpler points-based assessment system is being used by the Tomáš Baťa University in Zlín (UTB, 2013). Both cite the objectification of performance assessment as one of their primary objectives, but neither makes the ultimate conclusion of directly coupling performance and remuneration by means of a transparent algorithm.

Problem Analysis

In the context of the 2015 MIAS management change, fundamental reorganization and strategic re-focus, it became essential to reconsider the whole system of academic staff management, including remuneration policies. This had three main reasons:

- The role of academic staff changed dramatically. Formerly, their workload focused on administration related to the organization of study programs taught by externs, combined with teaching non-essential courses. Research and other creative activities were not required, and thus virtually non-existent, which became inadequate under the new circumstances.
- Performance-based remuneration exceeding fixed salaries, determined centrally by CTU directive, was based on employment contracts and, first and foremost, depended on the individual's employment history with MIAS. Its actual coupling to current or recent performance was thus extremely weak and often arbitrary, with frequent abysmal gaps in the remuneration of faculty with comparable productivity.
- Since mid-2015, MIAS started recruiting new staff in various academic positions in order to meet its key objective of developing into a standard academic institution with an appropriate structure of lecturers, publications and research projects. The process took a very swift course, and by mid-2016 most of the stipulated targets were met. From the personnel composition point of view, however, this resulted in a highly fragmented environment, comprising multifarious types of staff, both original and new, with sundry previous experiences, research and teaching potentials, as well as motivations for their meaningful utilization and further development.

This led the new management team of MIAS to expedite the development and implementation of a quantitative performance assessment system based on KPI. Under the circumstances, it seemed obvious that any system aspiring to engineer sweeping material change at MIAS must meet the following attributes:

- Universal application: The system should take the form of a generally applicable directive for academic staff irrespective of their seniority (which is taken into account by the salary grade determining fixed remuneration) or departmental posting in order to avoid legacy biases, seniority and departmental conflicts and other issues.

- Strict fairness and objectivity: This attribute serves to satisfy legal requirements and facilitate universal acceptance by existing staff, a number of whom may perceive a prejudice and adverse personal impact by the new system. It also considers mitigation of undue personal influences on middle-tier managers (department heads), as well as potential legal risks that might possibly arise due to cuts in individual remunerations. Accordingly, the system strictly avoids any use of soft and arbitrary performance indicators.
- Immediacy combined with a capability to grasp the natural variability, both personal and intertemporal, which is characteristic for the workload structure of academic staff: To facilitate rapid progress in meeting the stipulated objectives and, in many cases, achieving fundamental behavioral change, it was essential to implement the system swiftly and with an appraisal period shorter than one year. On the other hand, extreme remuneration fluctuations resulting from natural output variations, such as uneven teaching workloads for particular courses among odd and even semesters or editorial deadlines in academic publishing, had to be avoided. This has been addressed by applying a structure of moving assessments.

System Design and Characteristics

Contrary to common practice when implementing KPI-based systems in business, MIAS undertook some rather substantial modifications, commensurate with its initial situation assessment and system objectives mentioned earlier.

In particular, due to the relatively flat organizational structure of MIAS and a size allowing the effective centralization of remuneration policy, as well as other policies related to internationalization or research, it would not have been practical to take a rigorous top-to-bottom approach to implementing KPI, initially setting indicators for the whole institute, followed by its departments, teams and individual staff. On the contrary, the system has been applied directly on the individual level for several distinct categories of academic staff including professors, associate professors, teaching assistants, researchers and instructors. In general terms, the former categories are expected to combine accredited teaching activities and research outputs, as well as career growth in these areas, while researchers are contracted to do primarily research and instructors to teach in non-accredited courses and perform non-essential teaching roles not directly linked to program accreditation, usually with little ambition to work their way up in academic careers.

The system has been structured so as to take into account priorities, guided by three determinants. The one was the consistence of its Key Result Areas (KRA) with the fundamental theses of the Long-Term Strategy of CTU in its updated edition adopted in October 2015 (CTU, 2016), the others ensured the coupling of its Key Performance Areas (KPA), and eventually the calibration of Key Performance Indicators (KPI), to extant and anticipated requirements by the National Accreditation Authority on the sustainable

structure and qualification characteristics of faculty teaching in its accredited study programs (AK, 2016b) and related requirements on professional promotions (doctorates, higher doctorates, professorships), as well as to the terms of financial support available from the Ministry of Education, Grant Agencies and other sources based on quantifiable or qualitative criteria.

Summarily, the Key Performance Indicators couple to:

- Accreditation terms of the programs and courses taught at MIAS;
- Career development requisites for MIAS faculty;
- Management objectives of MIAS, including its strategic priorities and financial sustainability.

The calibration of performance indicators has initially been derived from qualification and performance objectives benchmarked against generically defined requirements for particular faculty categories and regardless of current budgetary constraints. This was a viable approach insofar that the key performance areas on the general level were obvious (acquire research projects, boost publication outputs, achieve internationalization) and, in the short term at least, a dramatic payroll budget excess due to massive and manifold target overruns was inconceivable, while in the longer term any growth would be expected to become self-financing.

In fact, simulations performed at calibration stage suggested that the system's parameters would initially lead to payroll cost savings. On the other hand, not meeting some of the change objectives swiftly (e.g. accelerating publication output by faculty members overseeing the programs or lecturing in particular courses) has been perceived as prohibitive, because it could have led to accreditation restrictions or even forfeiture, thus jeopardizing the existence of MIAS.

It was also postulated that the activities partial to the selected Key Performance Areas tended to cascade and create numerous synergies, with e.g. research project work leading to valuable publications, publishing facilitating teaching innovations, and student work serving as partial inputs to research. This should create positive feed-backs in the system, further enhancing its efficiency.

Implementation Details

System Parametrization

Each individual's assessment takes place semi-annually, by the end of each semester term, taking into account performance indicators reported over the last twelve months. This assessment then directly determines his or her performance-based remuneration for the following six months.

The system uses two essential parametric elements:

- A KPI assessment table, determining basic and incremental productivity standards of faculty based on their functional category;
- A remuneration instruction, determining fixed salaries based on pay grade and performance-based remuneration rates.

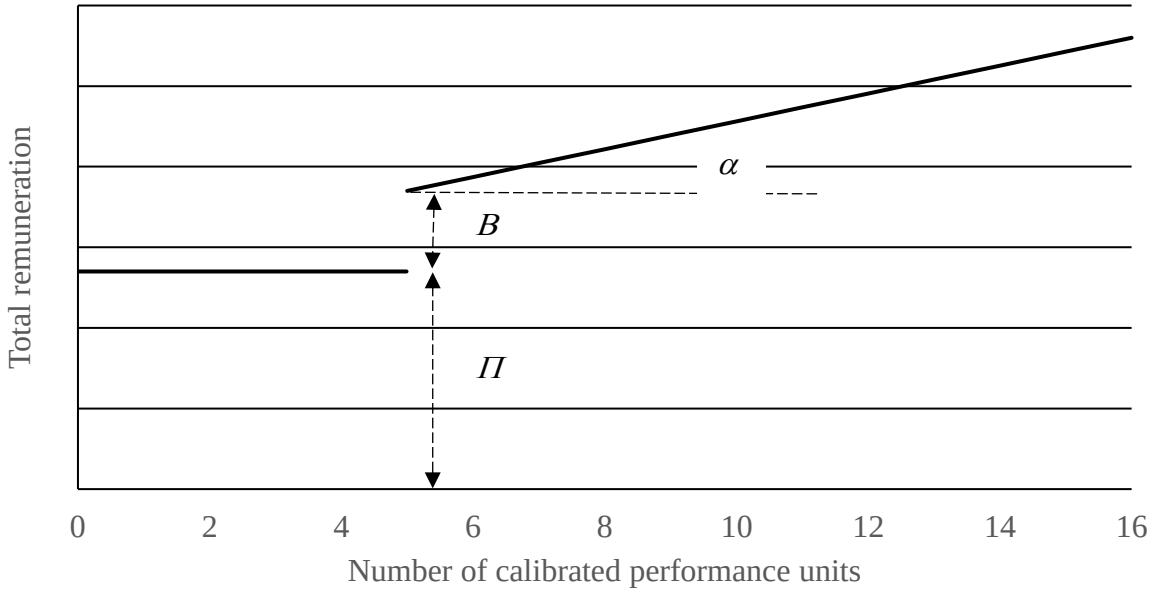
The KPI assessment of career academic staff makes allowance for the common individual and intertemporal variance of outputs, but principally requires a base component of accredited teaching combined with research. Accordingly, the criteria for satisfying minimal performance requirements needed to claim any performance-based remuneration are set as one mandatory calibrated unit of performance reported in each of the domains of accredited teaching and research outputs, supplemented with additional units of performance reported in the domains of teaching, research or internationalization that determine their fulfillment or excess.

The criterion for awarding 100% performance-based remuneration thus entails:

- Completion of both mandatory units of performance (accredited teaching and defined research outputs); as well as
- Completion of at least three supplemental units of performance related to at least two of the three Key Performance Areas (teaching, research, internationalization).

The person who does not meet this criteria is not entitled to any performance-based remuneration, while any excess increases the base rate linearly as indicated in general terms by Figure 1 (i.e. without taking into account all specific rules determining the mandatory structure and recognition terms of performance units). The value Π (fixed salary) is determined by CTU centrally-defined pay grades, while B (performance remuneration base rate) and α (rate of performance remuneration progression) are part of the system's calibration.

Figure 1: An individual's total monthly income based on KPI fulfilment



Source: Author

The algorithms for researchers and instructors are somewhat simpler, given the less complex set of objectives for these categories.

To improve functionality, the system also includes several specific regulations, including notably:

- Transitional provisions for newly appointed staff, who cannot be realistically expected to assume full initial productivity, for example related to publication on behalf of MIAS, and their assessments may thus be temporarily based on extrapolation or appraisal.
- Long-term assessments over five-year horizons, allowing faculty achieving universally outstanding performance levels over this period to claim performance-based remuneration without meeting all the specific minimal criteria in all the key result areas; this comprises a tenure-like measure that will allow such individuals to take e.g. partial research or pedagogical leave without any adverse effects, as it would not harm their qualifications or academic careers anyway.
- The option to reclassify individuals who, from a longer-term perspective, are not expected or motivated to meet the performance benchmarks commensurate with their current categorization if there is a common interest to continue their employment in a different role; typically, this arrangement may transfer a teaching assistant into an instructor role.

For the sake of illustration only, several examples of the system's parametrization follow:

- One performance unit can be attained by an Associate Professor in the first Key Performance Area (teaching) who teaches in an accredited program course for 4 hours per week; this would be 8 hours per week for an Assistant Professor.

Coefficients increase this value for teaching in a foreign language or for the design of a new course.

- One performance unit can be attained by an Associate Professor in the second Key Performance Area (research) for publishing two peer-reviewed papers and two conference research papers; the same result would be achieved by an Assistant Professor publishing just three such papers.
- A supplementary teaching domain unit can be obtained, for example, for additional 4 teaching hours, or supervising 8 theses and publishing a set of teaching materials.
- Performance units in the third Key Performance Area (internationalization) are collected by faculty who teach in English programs, lecture abroad, publish internationally or lead international projects.

Notes on Data Management

One particular issue arising as part of the system's implementation involved data collection and processing. For each individual, information needed to be obtained on performance indicators, which are normally administered in several distinct repositories, not connected at CTU. Also, much of the data needed to be structured in a completely different manner, while some information had previously net been collected at all. At the same time, implementation needed to be swift in order to achieve the required objectives.

This problem was addressed by a gradual phasing-in of system support. In the first stage, all information, including the necessary historical data, was collected manually. While, admittedly, this was a fall-back strategy, it brought several benefits. Above all, it involved all future stakeholders including the employees themselves and their supervisors in the process early during the development of the model, facilitating its acceptance and utilizing their feedback in its initial calibration. All data was thus also subject to rigorous initial control.

During the first year, all the data was organized in a structured Access database, with its user interface, as well as the necessary algorithms, embedded in Excel spreadsheets. This made the software structure sufficiently open and flexible to allow gradual development focusing on clear efficiency improvements.

Accordingly, it is now possible to download batches of data from several external repositories, even though some data still needs to be input manually. Given that the residual manual inputs typically relate to events that do not occur very frequently (such as the commencement and conclusion of external projects), and that the system's database generally needs to be updated only twice a year, this is not percieved as a major inconvenience.

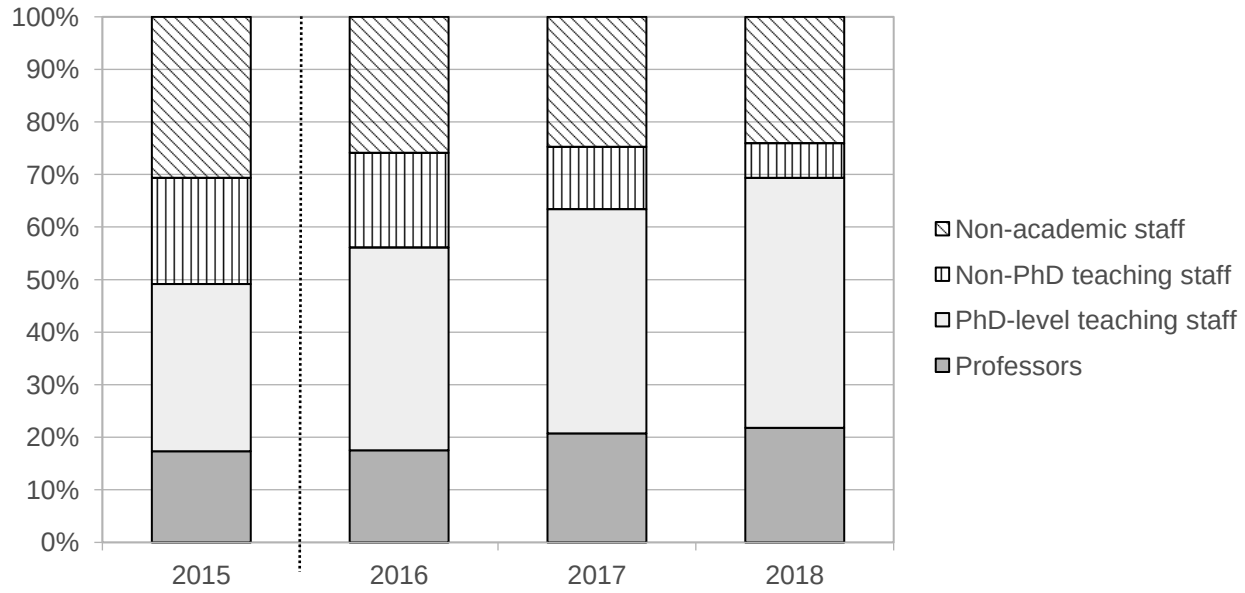
Results

Following the 2018 Winter Term, i.e. three years after inception of the system, it is possible to assess its impacts. There was obvious improvement in several indicators that are used to assess the performance and quality at MIAS, and also have a tangible impact on its financial standing.

Figures 2 through 5 demonstrate the development of MIAS faculty structure, research projects involvement, the quantity and quality of its publications, and the number of international students in English-taught programs MIAS and courses taught in English. In each case, vertical dotted lines indicate introduction of the new system. It is obvious that structural personnel changes have virtually eliminated non-PhD faculty in teaching positions and the newly ordained staff structure and increased motivation facilitated significant improvements in all target areas within two years.

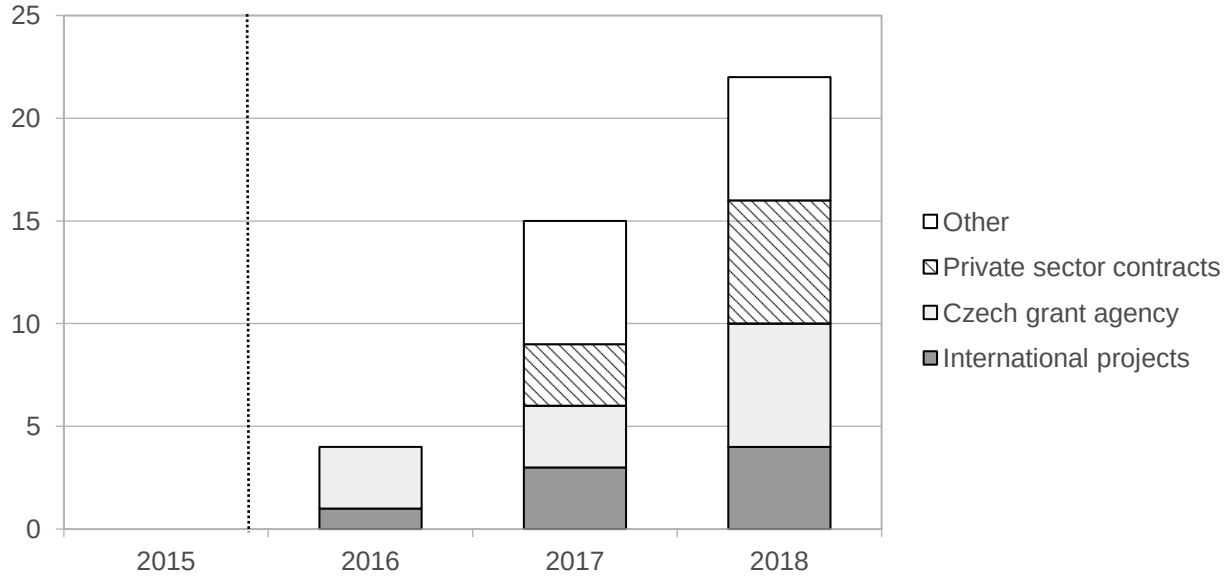
The budget structure also improved considerably, with the share of public funding based on student numbers declining from 85% in 2014 to less than 60%, based on preliminary 2018 data. Most importantly, however, MIAS was successful in the new accreditations of its study programs, consummated in June 2018.

Figure 2: Personnel structure



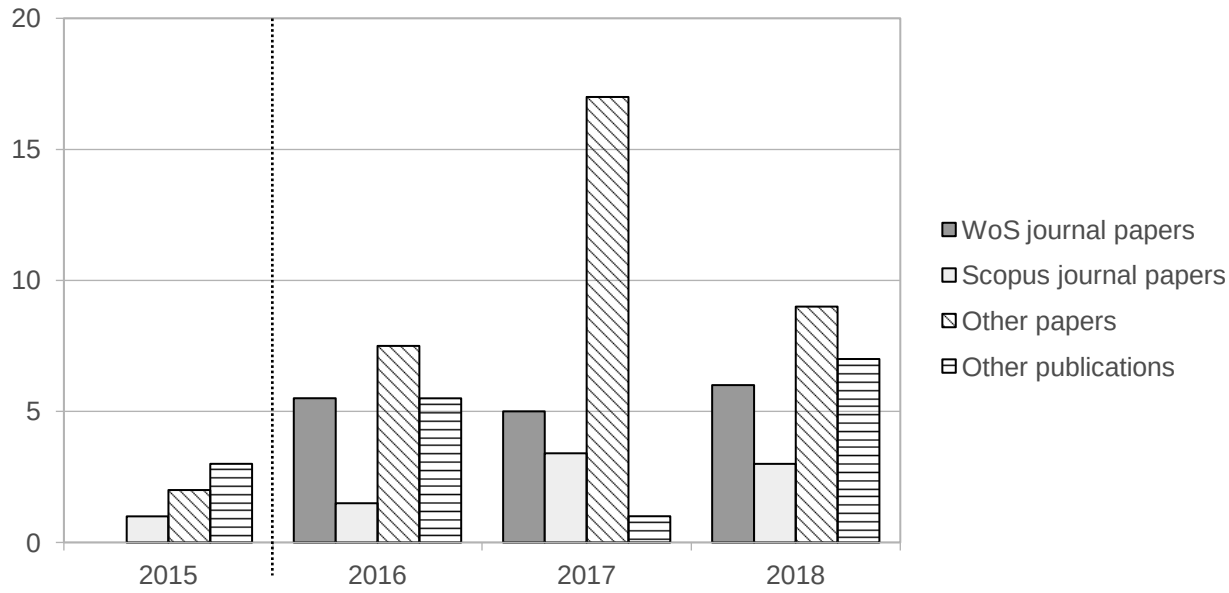
Source: Author, based on institution's data repository.

Figure 3: Involvement in projects



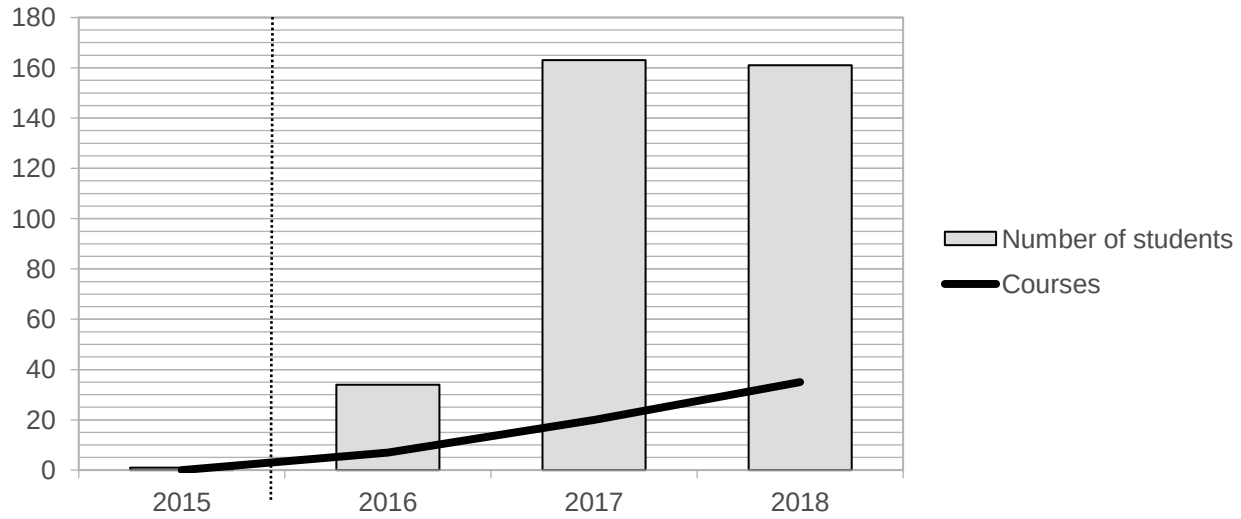
Source: Author, based on institution's data repository.

Figure 4: Publications



Source: Author, based on institution's data repository. Does not include conference papers and minor journals.

Figure 5: International students and courses taught in English



Source: Author, based on institution's data repository. Not including language courses. Many courses taught in English are also attended by students from the Czech programs.

Conclusion

The missions of higher learning institutions do not include just education and directly related processes, but also the development of science and research, as well as internationalization activities. This puts a highly demanding set of requirements on academic staff, who must fluently and effectively partition and organize their workloads so as to generate meaningful outputs in all these key performance areas. However, maintaining a long-term balance between particular activities is critical, and evolves from the needs and priorities of the academic institution, as well as from the individual's personal capabilities, potential and preferences, with some naturally inclined to do more research, others to teach.

The establishment of a fair, transparent and efficient assessment system with immediate feedback and results inducing behavioral changemust necessarily involve simulations of various pattern scenarios of individuals' activities to ensure a well-balanced set of incentives that would not encourage moral hazard involving utilitarian and, from a long-term point of view undesirable, biased focus on particular outputs. On the other hand, a smart setup creates extremely valuable synergies between the key performance areas, benefiting the whole institution. For example, participating in research projects, most notably international ones, leads to an increase in creative outputs, as well as to more intense knowledge transfer in education. Last but not least, all of these outputs are critical in institutional assessments guiding the process of accreditation, while also having a direct impact on an academic institution's funding resources, making the system an essential instrument of sustainability, both from the institutional and financial points of view.

In its entirety, the system described herewith has first been used for the assessment of MIAS faculty in September 2016, comprising performance indicators registered from September 2015 through August 2016, with its results determining individual remuneration for the following six months. In terms of the principal objectives its impacts so far have been encouraging. On the one hand, a part of the original academic staff have decided to leave MIAS or requested role reassignments, on the other hand, a competitive environment swiftly came into being, with capable individuals aspiring for teaching assignments as well as research teamwork participation. At the same time, a number of recent applicants for faculty openings have frankly stated that the existence of such a system has positively motivated them to join MIAS, notwithstanding their short-term remuneration expectations, which suggested that it had become a material competitive advantage for attracting academic talent.

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