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**ANALYSIS OF PROJECT LIFE CYCLE RISK FACTORS
IN A PUBLIC UNIVERSITY**

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Project management in a public university

Growth opportunities for higher education have significantly increased since Poland joined the European Union. A wide range of grants, such as Innovative Economy Programme, Human Capital and Infrastructure and Environment Operational Programme offer financing to encourage universities to apply for sponsorship of their objectives. This is a wide stream in the torrent of funds available for the sector. It complements the local support provided by National Science Centre and National Centre for Research and Development (NCBiR). There is a magnitude of financial opportunities for research and development, teaching, infrastructure or the organisation, which offer tremendous financial support for universities.

New opportunities generate new risks, especially when it comes to managing the university's finances. Generally, undertaking any projects involves investing university's own funds, as early as at the stage of preparation of a grant application, logistics as well as extension of financial support throughout the duration of the project and during its sustainability period.

The university has to guarantee coverage of eligible and non-eligible costs and achievement of project goals. If project deliverables are not met or the requirements of public procurement law or guidelines on utilising the resources are not satisfied, the university takes financial and reputational accountability. This includes returning the grant in full together with interest. Financial consequences may be especially damaging, even more so, as the management style in this sector is not accustomed to strict regulations. The matter is complicated further by the legal intricacy of guidelines and dynamically changing interpretations of the laws and regulations as well as terms of grant agreements signed. All in all,

it is a great challenge for universities using above mentioned funding as well as for project and risk managers.

Bearing in mind all project risks, the project life cycle can be divided into five stages: feasibility study, preparation of a grant application, contract signing, project implementation and sustainability period. This categorisation is driven by different risks associated with each stage as well as systematic approach to the issue.

Feasibility study

The first stage of a future project is to investigate the task, the completion of which may later be financed from the outside. It is important to assess the risk of project failure at this stage. Furthermore, in the research and development space, it is vital to employ innovative ideas for projects which are competitive. Before applying for a grant, a university often needs to complete costly groundwork using its own funds. This involves a feasibility study as well as time spent by the researchers to complete tasks in a given subject. Also it is known from experience that high quality projects introducing innovative solutions, projects that once completed will contribute to science, the community or the economy and will create new technology, materials or products have the best chance of obtaining a grant... Therefore, by financing mediocre solutions, the university is destined to lose its money, unless it is ready to finance the project in full and does not expect outside sponsorship. As a result, from the risk perspective, the university should concentrate on most innovative solutions, which are promising contributions to science.

It is also advisable to educate research staff on project funding principles as well as competition rules. They should be aware and be able to plan for the fact that within the project they will be obliged to transfer intellectual property and will not be able to purchase missing equipment. Therefore, there should be effective communication between academic and administrative staff managing projects.

This will result in eliminating weak points and increasing the probability of obtaining a grant. It will lower the risk of financing projects with low probability of acceptance by the financial institution.

Preparing a grant application

The second important stage is drawing up a grant application. At this stage, project risk should be assessed as:

1. Risk existing for the whole university, caused by the potential financing of the project during its implementation and in its sustainability period.
2. Risk of failing to secure a grant.

The following basic risk factor categories should be taken into account when evaluating a project in the first instance: financial, pertinent, legal, planning and resources.

Financial risk factors:

- **project value** – the higher the value, the higher the risk exposure to the university,

- **accurate estimate of project costs** – an error made at this stage causes an issue as the error can be multiplied by a number of projects,
- **university's own contribution (to the project) necessary to complete project tasks** – the larger the contribution, the higher the risk,
- **project financing** – advance payments are more beneficial for the university than alternative methods of funding the project,
- **university needs to provide internal lending to the project** – higher lending targets increase the risk and limit university's spending in other areas,
- **complementarity of project co-financing** – is the external funding amount sufficient to cover all planned and necessary project activities,
- **implicit state aid given to the university**,
- **indirect implicit state aid given by the university** – this issue needs to be addressed when drafting a grant application. If vital issues are missed, non-eligible costs may be incurred or the grant agreement breached.

Pertinent risk factors:

- **probability of project meeting delivery targets** – overpromising may, in case of failure, lead to the return of funding together with interest,
- **operational dependency between project tasks** – dependencies existing between project tasks reduce the probability of success due to a greater need for timely coordination,
- **consortium leader's experience** in completing similar projects,
- **project purposes need to be consistent with university's development strategy** – if these two are aligned, it is more likely that university's management will be supportive of the project,
- **appointing a project manager with experience in similar projects** increases the probability of avoiding basic mistakes,
- **appointing a project team with experience in similar projects** increases the probability of completing project tasks,
- **project objectives regarding commercialisation of the results** – successful commercialisation together with financing patent protection are a huge challenge, which increases both risk and costs.

Planning risk factors:

- **project duration** – long duration increases the risk, as it is hard to predict what is going to happen in a few months, let alone years,
- **university's role in the project** – a leader, a partner and a contractor have all different roles, leaders bear most responsibility as they supervise other research facilities working on a project,
- **number of project partners** – a higher number increases the probability of problems occurring,

- **number of project tasks** – a large number of different tasks increases the probability of project failure,
- **multiple businesses participating in the project** – may cause additional complications, especially when commercial companies do not share the same view on the purposes and execution of a project,
- **licensing requirements** for the completion of project tasks may delay the process and increase project expenditure and risk,
- **number of project beneficiaries (for learning projects)** – in theory, a larger number complicates the delivery and increases the probability of failure,
- **incorporating time reserves into the project schedule** – this is often forgotten in the planning stage, multiple delays in project activities, e.g. in completing public procurement, often leads to changes in the schedule or delaying the delivery date, in extreme cases, it may lead to the failure in achieving all project deliverables,
- **role of the project manager** – assigning a project manager role to an existing employee as opposed to a contractor offers more predictability and controllability, e.g. when managing risk.

University's resources:

- **sufficient personnel** for the full project life cycle; are we able to replace key personnel during periods of absence. Inability to replace the creative director may, in extreme cases, stop the project,
- **sufficient material resources** – e.g. land for a new investment in infrastructural projects, adequate research equipment, conference rooms in teaching projects. If the resources are not available internally, are we able to provide sufficient coverage for the duration of the project,
- **accommodation fulfilling technical specifications** – research and development projects requiring the purchase of equipment demand adequate technical conditions, e.g. durable ceilings, air-conditioning, power supply, etc.

Legal risk factors:

- **protecting intellectual property should be part of the project** – lack of provision in this area may cause friction and misunderstanding,
- **project financing agreement; does it include clauses that disadvantage the university** – uneven accountability or complete lack of equivalent funding may not be the reason to reject the project, but it should encourage revisiting the contents of the agreement to avoid undertaking a project that will disadvantage the university,
- **guidelines or their legal interpretations may cause risk to the settlement of a project** - this is one of the more relevant issues in project delivery; interpretations that change dynamically may dramatically change the risk level,
- **consortium agreements** – exercise caution when signing agreements of which you are not the author or have no influence over their clauses,

- **consortium agreements with clauses disadvantaging the university** – similar to grant agreements, the content needs to be scrutinised and unfavourable or imprecise clauses renegotiated if possible.

The occurrence of the above risk factors, especially from the same category, suggests that projects, which receive co-financing, should be heavily monitored. When assessing the potential risk of the project in its later stages, it is important to adhere to contradictory procedure, in order to take into account both the financial capability of the university and the views of the research staff.

The key risk for the university applying for external funding is the probability of failing to secure a grant.

There are basic risk factors influencing the award of a grant, which need to be taken into account before submitting an application:

- **formal requirements are not met** – the pettiest reason to reject the grant,
- **insufficiently innovative ideas** – risk factor that should be taken into account by the researchers,
- **high costs** – projects generating too high expenditure, especially in remuneration costs are not supported, however, it is fairly easy to recognise such grant application and correct the calculations,
- **unrealistic project objectives** – another factor to be remembered by the research staff when preparing a grant application,
- **low project competitiveness** – understood as project quality against the competition,
- **reputation/skills of the project leader** – very often the project is associated with its leader, if their competencies are regarded as lower than those of their competitors, grant allocation can be affected,
- **a single person responsible for a number of projects** – this situation is sometimes unavoidable, especially in small research and development units. The issue is worth considering in order to increase the probability of success.

From receiving a grant to signing an agreement

After a grant is received, it may take up to ten-odd months before an agreement is signed. In the meantime, a lot of factors that originally caused the university to apply for funding may change. As the circumstances change dynamically, it is advisable to review some of the points before signing the agreement to ensure they are all adhered to. On some occasions the organisation does not use the awarded grant, as it is unable to complete the project due to the following reasons:

- loss of key personnel, e.g. research staff or lecturers,
- loss of infrastructural resources, e.g. a laboratory or equipment,
- loss of ability to finance or co-finance the project,
- pulling out of key consortium members or stakeholders,

- change in funding terms by the financing institution,
- inclusion of clauses that are unacceptable for the university,
- changing law.

It is advisable to check if the application to which we are preparing an agreement has passed an earlier verification stage. Theoretically speaking, it is likely that the risk was not assessed when the application was drafted.

Project implementation

Project implementation is often the longest and the most important stage in the project life cycle. It is then that all risks manifest themselves. The success of the project depends mostly on the completion of the tasks at this stage. Therefore, it is crucial that the identification and assessment of risk is properly conducted.

It is impossible to list all risk factors occurring during project implementation. There are a number of categories. A project manager should be aware that at this stage there may be an issue with resourcing, e.g. insufficient personnel, under skilled or insufficiently experienced or motivated workforce. This may result in inefficiencies within the project. Occasionally, key personnel may leave the project due to unforeseen circumstances. The inability to replace the project leader from within the project poses a significant risk.

Insufficient cooperation with consortium members or employing unreliable contractors, especially in infrastructural projects, poses a significant risk. This often leads to delays in the delivery of project tasks or even prevents the successful completion of a project. Choosing an unreliable contractor in infrastructural projects often leads to a new tender, which unfortunately, generates non-eligible costs as well as issues with the guarantee or warranty for completed construction works.

Relatively frequently projects generate high non-eligible costs due to remuneration, subcontracting or purchases. When a university undertakes a large number of projects and goes over the limit of non-eligible costs for the majority of them, the financial liquidity of the organisation will be impacted on. Incurring unplanned non-eligible costs is often a result of a breach in public procurement or internal procedures, or missing project documentation. A high financial risk is posed by breaches of tax regulations, especially VAT, which is related to insufficient analysis and monitoring of project revenue. In research projects the protection of intellectual property as well as commercialisation of the results are not always taken into account. This affects university's provision of implicit state aid.

Other serious risks are: inability to complete the project in compliance with the agreement signed, the project being abandoned and inability to achieve project objectives, which is often related to ineffective commercialisation (research projects). Disadvantageous changes in the interpretation of the terms of the grant agreement can cause long-term financial consequences for the university.

Other risks in the implementation stage are: loss of infrastructural resources, equipment and accommodation, loss of part of the funding due to the principle of proportionality

and being unable to continue financing project activities. Sometimes project tasks do not follow an agreed schedule. This is not a concern, provided that the intermediate body accepts the change and it does not negatively impact on project deliverables. It is more of a concern when resources are not used according to the plan or out of the scope of the project.

Moreover, ongoing projects sometimes lack regular monitoring, tracking deliverables or quality assessment of research carried out. Often information and publicity activities are not carried out or there is no sustainability plan.

Sustainability

The final stage of the project is its sustainability period. Although often unappreciated or omitted in the HR resource planning, it is essential for a successful project delivery and fulfilment of the obligations. At this stage some of the risk factors are equivalent to those in the implementation stage:

- insufficient cooperation with the consortium members,
- inability to complete project deliverables,
- failure to complete project deliverables,
- university's provision of implicit state aid,
- loss of key personnel on the project, which may result in the loss of their expertise and experience,
- disorderly project documentation.

Project management team may also come across new challenges. Most relevant risk factors which have not appeared in earlier stages are:

- lack of personnel to sustain the project,
- not using project deliverables according to their purpose – infrastructure, equipment, research results,
- ineffective commercialisation of research results,
- lack of interest from the beneficiaries in research projects that aim to commercialise results,
- retrieving lost equipment and returning it to a working condition in equipment projects,
- project revenue is not analysed or monitored,
- project is not evaluated,
- lack of information on financing equipment/labs/building by the EU,
- project deliverables are not monitored for appropriate use.

Conclusions

Funds offered frequently to universities enable scientific, educational and infrastructural developments like never before. When using the funds, one should be aware of the risks related to external funding. It is important to make the beneficiaries aware of the above, so that they can assess the risk of the project for the organisation and make a con-

scious decision. As per the above list of risk factors, the key project stages are preparing a grant application and project implementation. When applying for co-financing one needs to be aware that an insufficiently innovative project idea will most likely be rejected but will paradoxically reduce the potential and actual loss for the organisation. Failure to identify and assess risk at the application or implementation stage will pose a much greater risk of returning the grant in full and with interest. One needs to remember that the grant is supposed to cover specific needs identified in the agreement. Ignoring these terms or overoptimistic assessment of the university's capability can have negative financial consequences. In addition, such situation paints a bleak picture of the university in the areas of research and development and education. Therefore, as the risk related to externally funded activities increases, it is justifiable to measure it at various stages of the project.

There are many categories of project risk. Although the risks mentioned above are real, without taking them and applying for grants, universities will not use their full potential and will miss a chance to accelerate their development. The solution may be an efficient project risk management, which will help mitigate the risks.

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Summary

This article summarises experience gained from conducting project audits as well as research on risk at various stages of a project. The paper identifies areas where the university is exposed to risk. It also systematises and exposes risks that can occur at various stages of a project. The aim of the above is to make the process safer and less costly for the organisation.

ANALIZA CZYNNIKÓW RYZYKA NA POSZCZEGÓLNYCH ETAPACH ŻYCIA PROJEKTU W UCZELNI PUBLICZNEJ

Streszczenie

Artykuł stanowi podsumowanie doświadczeń zebranych w trakcie realizacji audytów projektów, jak również prowadzonych prac badawczych nad ryzykiem występującym na kolejnych etapach życia projektu. Celem autora było uświadomienie odbiorcom, jakie zagrożenia mogą wystąpić na poszczególnych etapach oraz w jakich aspektach uczelnia poddana jest ekspozycji na ryzyko. Pośrednio, dokonano również usystematyzowania w zakresie podejścia do ryzyka na następujących po sobie etapach procesu związanego z realizacją projektu przez uczelnię publiczną. Zasadniczym celem powyższych działań jest uczynienie przedmiotowego procesu bardziej bezpiecznym, a tym samym mniej kosztownym dla organizacji.