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Report of the First ASTP Directors' Forum 2023

Enhancing Knowledge Transfer Offices: Addressing Information Needs and Challenges in Reporting to Stakeholders

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Preface

This report is of interest to the management of Knowledge Institutes, Knowledge Transfer (KT) professionals, IT and data directors of Knowledge Institutes, Research Offices, Legal Offices, Governmental leaders with responsibilities in Knowledge Transfer, suppliers of IT-tools and everyone who is dealing with data generated in a Knowledge Institute.

Knowledge Transfer Offices (KTOs) play a crucial role in facilitating the transfer of knowledge, technology, and innovation from academic institutions to industry, fostering economic growth and societal impact. However, KTOs face significant challenges when it comes to accessing and utilising the necessary information for effective knowledge transfer. This report delves into the information needs of KTOs at various stages of the knowledge transfer process, highlights the difficulties encountered due to inadequate information recording across different departments, and explores the tools commonly used by KT professionals to overcome these challenges. The authors want to highlight the responsibility of the KTOs. Our stakeholders trust on us in the information we are transferring. Due diligence activities are always under time pressure and efficient storage and traceability of historic data and documents are crucial in this process. The incubation process at Knowledge Institutes is much longer than before because investors and industrial partners expect higher technology readiness levels (TRL) and commercial readiness levels (CRL), during this prolonged period key people can leave the organisation. To efficiently cope with the change of personnel, we need excellent reporting and database tools so that no time is lost. The paper emphasises the importance of aligning KTO governance and objectives with information strategies, learning from best practices, and advocating for standardised information systems on a broader scale.

This report is based on the ASTP's Survey on data management tools and discussions held during the ASTP Directors' Forum in 2023. Essential insights include:

- University information systems often lack alignment with the third mission of knowledge transfer and less time and resources are provided to collect data compared to university ranking efforts.
- KTO governance and objectives differ, as well as the political landscape. There is no one-size-fits-all IT solution that can address these variations. However, learning from best practices and optimising existing tools or developing new ones can help overcome challenges.
- IT solutions will not fix the complex environment in which KTOs operate. KTOs must align their information strategies with their overall objectives to ensure effective knowledge transfer. This includes recognising the complexities of their environment and actively seeking out best practices and solutions that fit their specific needs.
- Key needs include standardisation on an EU-level.
- Aligning knowledge transfer objectives with the institution's long-term vision and strategic priorities ensures sustained commitment and support from key stakeholders.
- The role of KTOs in collecting and disclosing information should be assessed, in relationship with Information Management (IM) departments.

The authors are aware that we have not covered the full spectrum of data management tools, moreover the use artificial intelligence is just starting up and the number of people that were involved are just a small representation of the total European KTO population. The new insights of the merger of some software providers were not considered during the time of our survey. Nevertheless, we were able to give a general overview of the situation at many KTOs in the year 2022.

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Introduction

Knowledge Transfer Offices (KTOs) serve as vital intermediaries between academic institutions and industry, facilitating the transfer of knowledge, technology, and innovation. These offices play a crucial role in driving economic growth, fostering innovation, and promoting societal impact. Knowledge Transfer professionals make business decisions and negotiate contracts with third parties based on technology and know-how developed by many inventors, funded by multiple parties, and embedded in a highly regulated ecosystem. However, KTOs face significant challenges when it comes to accessing and utilising the necessary information for effective knowledge transfer. Effective knowledge transfer requires the right information at the right time, tailored to the specific stages of the transfer process. Each stage, from opportunity identification to impact assessment, necessitates different sets of information to make informed decisions, engage with potential partners, protect intellectual property, and evaluate outcomes. However, the fragmented nature of information recording within various departments can hinder the seamless flow of data and impede the efficiency of knowledge transfer efforts. In addition, funding organisations, such as the institute's management and the government, expect a high return on investment, Knowledge Transfer Professionals must report quite profoundly and need to have access to multiple output and impact data.

It is to the benefit of all parties involved that these professionals could work with the best IT tools to manage and oversee the development history of each technology and know-how driven project.

This report aims to delve into the information needs of KTOs, explore the difficulties encountered due to inadequate information recording across different departments and highlight the tools utilised by KTO professionals to address these challenges. By understanding the nuances of information needs and the difficulties faced, KTOs can learn from best practices, make better use of existing tools, and potentially develop new strategies and technologies to improve their knowledge transfer outcomes. By addressing the information needs and challenges faced by KTOs, organisations can enhance their ability to achieve successful knowledge transfer, foster collaborations between academia and industry, and maximise the impact of research and innovation.

This report provides insight into the status of these tools and the prospects of the needs of these professionals. The insights are collected from directors of knowledge transfer agencies who are members of ASTP. ASTP is Europe's most important association of knowledge transfer professionals. This report is also written from a European perspective, so regulations and approaches may differ in other regions. KTOs are widening their scope from a pure commercialisation output focus towards the broader application of the research output.

Information Needs in the Knowledge Transfer Process

During the ASTP Directors' Forum, several information needs were identified:

1. Information to manage the knowledge transfer process within the KTO.
2. Information to report on KTO performance for external and internal stakeholders.
3. Data management to feed impact and outcome reports.

Addressing the diverse information needs throughout the knowledge transfer process is essential for the success of Knowledge Transfer Offices. By understanding and fulfilling these information requirements, KTOs can effectively identify opportunities, protect intellectual property, foster collaborations, assess the impact of their knowledge transfer efforts, and develop future policy and strategy.

Information to Manage the Knowledge Transfer Process within the KTO

To effectively facilitate knowledge transfer, Knowledge Transfer Offices (KTOs) must identify and fulfil specific information needs at various steps of the knowledge transfer process. Many experts and actors are involved with their specific roles and responsibilities. Each expertise has his specific work methodology and skill set. The knowledge Transfer Process is not a stepwise and linear process but a more dynamic iterative process with many stakeholders involved (see figure 1). The process from basic research towards impact outcome can easily take ten years or even longer.

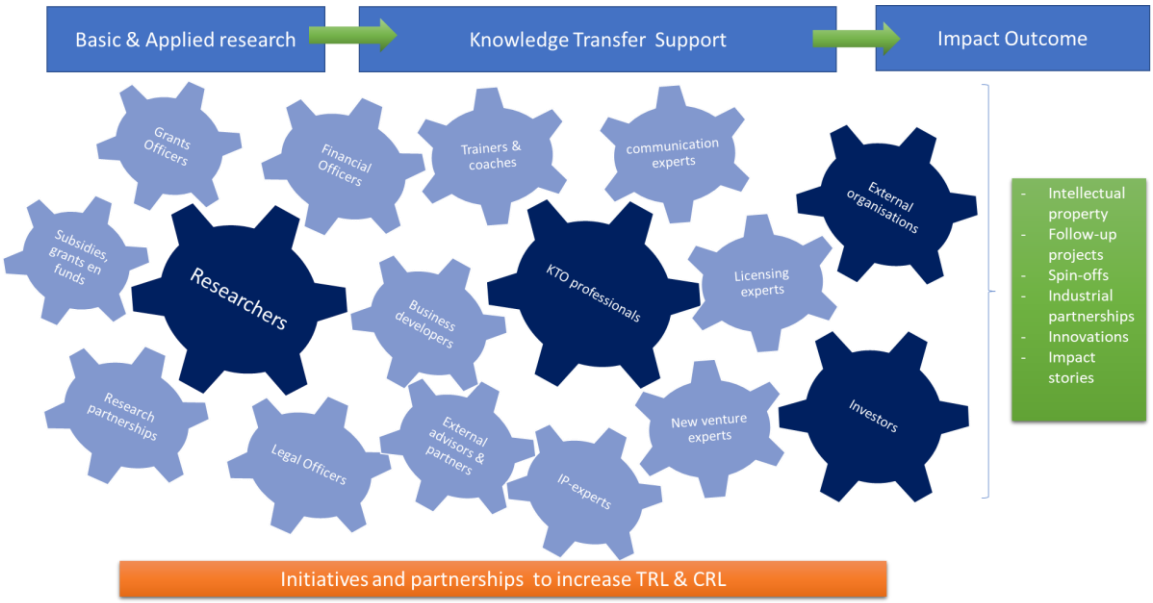

Figure 1: The complex process of university knowledge transfer with different stakeholders and experts

Identification of opportunities from research activities and results

During the initial stage of the knowledge transfer process, KTOs need access to information that helps identify potential opportunities for exploitation, commercialisation, and collaboration. The starting point is the research project. Every research grant will be linked to research agreements and the partnerships will in most cases be arranged by research contracts, NDAs, MTAs, etc. A challenge is presented in the fact that the basic principles of people and project management to monitor and manage research results within the basic and applied research period are rarely present. In the most optimal way, these processes are monitored by central offices such as the research office, subsidy office, financial office, and legal office. As a result, information needed to determine the transfer potential is not available or at least fragmented. On other challenge is that each research project is usually seen as a stand-alone project, with main priorities related to the budget and publishing strategy. The publication is considered the end-goal whereas, from a

knowledge transfer perspective, these brilliant ideas and technologies that will emerge from the research are the starting point and the moment that the Knowledge Transfer professional is involved.

Key information needs for KTOs include research outputs to identify valuable intellectual property with potential commercial applications. The KTO-professional e.g., the business developer need to assess the intellectual property rights of other earlier involved parties and which rights are already agreed in contracts.

Evaluation & protection of the invention

The second expertise is the assessment and protection of the invention. A knowledge transfer professional must evaluate the technology for its value to society. Is the technology or know-how a solution to an existing problem? Is the proposed solution new and does it have a competitive advantage over other solutions? In what status is the solution and can it be developed within a reasonable timeframe and at reasonable cost so that it will be acquired by interested industry partners and/or investors to be launched as a marketable product? On occasion, the technology must be protected by a patent application or a trade secret.

In this phase, the researchers are asked to complete an Invention Disclosure Form (IDF) that contains all the necessary information to assess the topics described. If still possible and necessary for the commercialisation of the solution, a patent can be applied for. Once promising opportunities are identified, KTOs require robust information management systems to effectively protect and manage intellectual property. In addition, it is crucial to connect all historical contracts and information in an accessible file. At a later stage when an investor or industrial partner is interested, they can ask to have access to a data room, moreover, this type of historical information is necessary to comply with the rights of inventors, involved external partners and grant organisations. Moreover, stricter rules regarding GDPR, export rules, dual use and the Nagoya protocol will also require more intensive assessment before proceeding with knowledge transfer. During this process researchers, legal officers, IP-managers, and business developers work intensively together.

The specific KTO Information management needs during the evaluation and protection process include:

- Understanding of the historical trajectory that led to the proposed technology, all the people and partners involved in the development of the technology, what other technologies, materials, data, and software were used to obtain the current result and finally what was already discussed at conferences about the solution communicated, publications, and public defences.
- Access to arrangements made with respect to the IP.
- Market research: Gathering market intelligence and industry trends to evaluate the commercial viability of research findings.
- Patent landscape: Assessing existing patents and IP rights to determine novelty and potential infringement risks.
- IP documentation: Maintaining accurate and up-to-date records of IP assets, including patent applications, trademarks, and copyrights.
- Safe storage of all information related to a Disclosure for due diligence.

(Co)-develop & market the invention to increase the TRL and CRL

The third expertise level is the drafting and follow-up of the knowledge transfer strategy. Once registered IP is secured, the clock is ticking and strict timelines, milestones, and deliverables must be obtained. Often the technology is still too early in the field of technical and commercial readiness. Specific funding and external support must be attracted to develop the solution into a minimum viable product or a demonstrator. This phase includes gathering information on the business case and development strategy from key opinion leaders, industry experts and investors. It also includes identifying potential partners for collaboration and transfer. This part of the process is often done by the researchers and business developers together with coaches and external advisors. Also, communication experts will help to make pitches and promote the technology in technology offers and newsletters. IP-managers are involved to strengthen the IP-strategy. This phase will take months or even years, with many forward and backward steps. Many times, the strategy need to be re-evaluated. In this phase we also face the risk of staff changes and lose of historical track and information.

KTO Information Management needs include:

- Documentation: meeting minutes and insights gained must be stored in folders so that this information is accessible to all team members involved in the valorisation process.
- Project tracking: monitoring project progress and milestones to ensure timely delivery and successful outcomes.

Transfer technology and know-how to third parties

The fourth gate relates to the negotiation of the licensing or a partnership agreement or the procedure for setting up a spin-off. The knowledge institute cannot commercialise the solutions to society, for that we need private actors. The most ideal scenario is that an existing industrial partner can pick up the solution and make it ready for the market. In most cases, the solution is still at too low TRL/CRL (phases 3 to 5), and a dedicated company is needed to make it more attractive as a business case. Therefore, universities create spin-off companies with investors. At this stage, the value of the technology should be assessed, as state aid regulations and government regulation allow publicly supported knowledge institutions not to distort the commercial market and should receive fair remuneration for the commercialisation of knowledge and technologies they have developed. In most cases, they should retain the right to research and teaching activities. Based on the information gathered in the former gates, they can calculate the historical investments, determine which parties should be involved in the contracts and which parties and persons should receive a share of the return on future income. Some technologies and domains may be limited due to previous contracts, this must also be considered in the final contracts. Technology and know-how are often licensed exclusively or non-exclusively, in a specific area and in specific regions. All this information must be stored so that this information is available when new additional licenses of contracts are negotiated. This phase is an arduous task for business development, legal and IP officers, venturing experts and license managers.

KTO Information Management needs:

- Overview of historical investments
- IP valuation, benchmark deals
- Storing contract (versions)

Managing the relationship and facilitate the post deal management

The part of the process is related to the follow-up of the contracts. Once the final contracts are signed, they must be carefully monitored. Often, specific milestones are negotiated that will cause financial or contractual events. Of course, if you invest a lot of time and effort to negotiate these in a contract, you should also be able check them. Once income has been generated, this income must be distributed among the contractual partners and, depending on the internal regulations, to the various stakeholders within the organisation (Knowledge Transfer Office, inventors, research groups, knowledge institute). All financial and fiscal regulations must be complied with. When a technology is licensed or transferred to a spin-off, the knowledge transfer office must also oversee the investments (cap table) and the minutes of the shareholder and/or board meetings. Again, contracts such as shareholder agreements must be negotiated and stored. Managing the relationships is also interesting to identify opportunities for future collaborative research. The post deal management can take an exceedingly long time and again here we face the risk of change in staff that has an overview of all the historical information regarding the deal and even more important the DNA of our partner.

Key information needs include:

- Technology transfer agreements: Managing and tracking contractual agreements with industry partners regarding licensing, royalties, and exclusivity.
- CRM-like tools to manage and follow-up the relationships with our partners.

Information to Report on KTO Performance for External and Internal Stakeholders

At any time, the KTO must be able to report on their tasks, deliverables, investments, outcome, and impact data. To evaluate the effectiveness and impact of knowledge transfer efforts, KTOs need information to measure and assess outcomes. However, KTOs often face significant challenges in obtaining the necessary information due to:

1. Fragmented information recording in different departments.
   KTOs often find themselves grappling with fragmented information recording practices within academic institutions. Relevant data may be spread across different departments and divisions, making it difficult to gather a holistic view of research, intellectual property, industry partnerships, and commercialisation opportunities. Siloed information creates barriers to effective knowledge transfer, as important insights and connections may remain hidden or undiscovered. Without a centralised system for recording and accessing information, KTOs struggle to leverage the full potential of their resources (see Figure 2).

2. Lack of standardisation and compatibility.
   The absence of standardised processes and formats for information collection and storage poses significant challenges for KTOs. Different departments may use disparate systems, making it arduous to integrate and analyse data effectively. Incompatibility issues between databases, software, and information management tools hinder the seamless flow of information and impede collaborative efforts. The lack of standardisation not only slows down knowledge transfer processes but also hampers accurate reporting to stakeholders, inhibiting their ability to make informed decisions.

3. Political landscape and governance variations.
   KTOs operate within a diverse range of institutional contexts, each with its unique governance structure and objectives. The variations in governance models impact the prioritisation and allocation of resources for information management. In some cases, the political landscape within an institution may result in limited support or resources for KTOs, diminishing their ability to establish robust information systems. The absence of a unified approach to knowledge transfer information governance further exacerbates the challenges faced by KTOs in accessing critical data.

4. Misalignment with university ranking efforts.
   The efforts dedicated to developing information systems for knowledge transfer often pale in comparison to those invested in university ranking initiatives. While rankings focus primarily on research productivity and academic performance, the systematic collection, management, and reporting of knowledge transfer data may receive less attention.

KTO information needs include:

- KT metrics and Key Performance Indicators (KPIs): Defining and tracking KPIs to evaluate the success of knowledge transfer initiatives.
- Surveys and feedback: Collecting feedback from industry partners, researchers, and other stakeholders to gauge satisfaction and identify areas for improvement.

This is often the most challenging item because all the data is stored in different systems and not in the right format for the requesting party's need. A lot of time and resources are lost due to manual activities to create such reports. Data, past contracts, minutes of negotiations and meetings, contact and financial data are a valuable source for the management and strategy development of a KTO. It is particularly important that these data are clearly stored, so that they can be found efficiently at any time. GDPR compliance and data security are also important aspects to which IT-tools need to be comply.

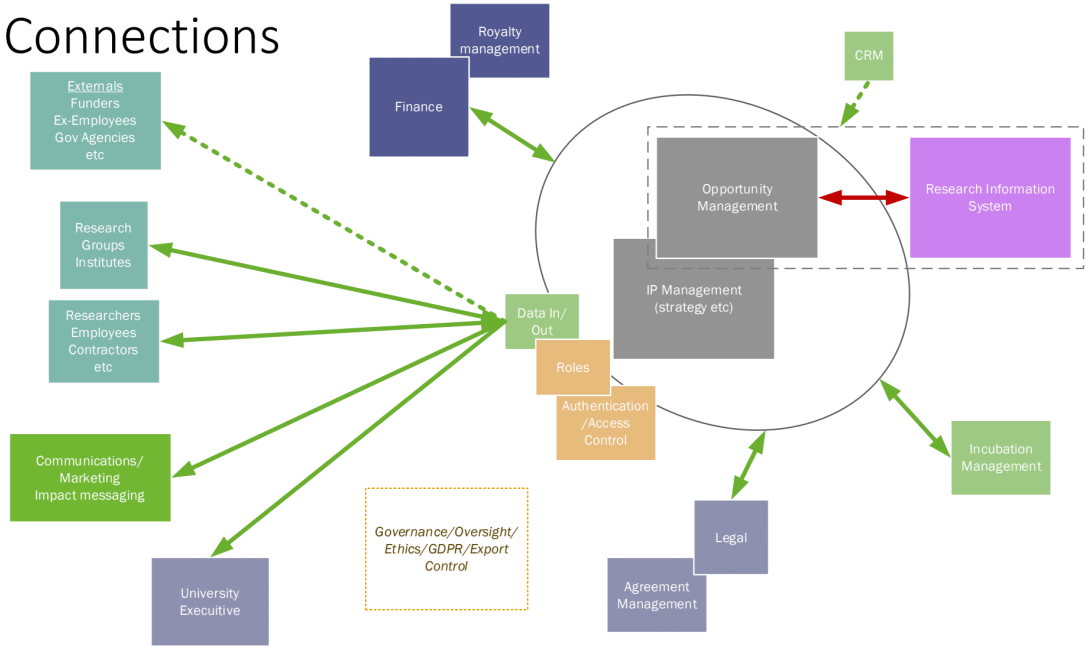

Figure 2: Example on how different aspects of the knowledge transfer process should be integrated

Data Management to Feed Impact and Outcome Reports

The impact of knowledge transfer extends far beyond the realm of academia, driving economic growth, innovation, and societal progress. Impact data are mostly generated outside the Knowledge Institute and are often collected by surveys.

KTO information needs include:

- Economic and societal impact analysis: Assessing the economic benefits and societal impact resulting from successful knowledge transfer activities.
- Long-term tracking: Monitoring the long-term outcomes and impact of commercialised technologies and collaborations.

Tools for Effective Knowledge Transfer

To overcome the challenges in obtaining and utilising the information necessary for successful knowledge transfer, KT professionals rely on a variety of tools and systems that aid in managing and organising information. This chapter explores some of the key tools commonly used by KT professionals to facilitate effective knowledge transfer. However, the current software specifically developed for KTO purposes does not capture the current needs. The software has often not evolved over time to cover the expanding needs of knowledge transfer professionals and is usually still at the level of an archiving tool and is developed as a standalone application. The integration with other aspects of research information systems is also insufficiently covered. Most systems cover only a small part of the research management and knowledge transfer process. IT suppliers should work on modulated tools that are dedicated to each individual step of the research management and knowledge transfer process (combined with expert specific user interfaces) but that are easily integrated to one system for the whole knowledge institute. Therefore, it is important that IT-suppliers have experts on board that know the full research management and knowledge transfer process.

Intellectual Property (IP) Management Platforms

Effective management of intellectual property is a crucial aspect of knowledge transfer. IP management platforms provide KTOs with a centralised repository to store and manage intellectual property assets, such as patents, copyrights, and trademarks. These platforms facilitate efficient tracking of IP-related information, including licensing agreements, patent applications, and commercialisation efforts.

Contract Management Solutions

Knowledge transfer often involves the negotiation and execution of various contracts, such as licensing agreements, research collaborations, and confidentiality agreements. Contract management solutions streamline the process of creating, reviewing, and storing contracts, ensuring proper documentation and compliance. These tools enable KTO professionals to track contract milestones, monitor obligations, and manage legal and financial aspects of knowledge transfer.

Customer Relationship Management (CRM) Systems

CRM systems are widely utilised by KTOs to manage and track interactions with external stakeholders, including industry partners, investors, and entrepreneurs. These systems help KTO professionals maintain a comprehensive database of contacts, track engagement activities, and monitor the progress of technology transfer projects. CRM systems also enable effective communication and collaboration between KTOs and their external partners.

Key Performance Indicators (KPIs) and Performance Tracking

Measuring the effectiveness of knowledge transfer activities is essential for monitoring progress and demonstrating value to stakeholders. KTOs utilise KPIs to track key metrics related to technology transfer, such as the number of licenses executed, revenue generated, and successful commercialisation outcomes. Performance tracking systems help KTO professionals analyse data, identify areas for improvement, and make data-driven decisions.

Surveys and Feedback Mechanisms

Obtaining feedback from stakeholders is crucial for understanding their needs, preferences, and satisfaction levels. KTOs employ surveys and feedback mechanisms to gather valuable insights from industry partners, entrepreneurs, and researchers. These tools enable KT professionals to assess the quality of their services, identify potential areas of improvement, and tailor their knowledge transfer efforts accordingly.

Project Management Tools

The Knowledge Transfer process follows a gate stage model. Project management tools provide KT professionals with a visual platform to plan, track, and manage project workflows. These tools facilitate effective collaboration, task assignment, and progress monitoring, ensuring that knowledge transfer projects stay on track and are executed efficiently. Monitoring of different Proof of Concept applications should be feasible.

Promotion

KTO need tools to promote and disseminate their tech and service offers. Ideally these offers should be linked as an output to the project and Valorisation files. We should be able to monitor the interactions based on the publication of the offers.

Financial Follow-up

Not only cost and expenditure of the KTO office should be monitored but also the generated income from contracts, follow-up of the division of proceeds, cap tables of investments and the historical overview of the value of shares. The financial tool must also be able to give an insight in the return on investments or can be used as a database to evaluate the outcome of historical deal terms.

Although most of the individual IT-solutions are available, not many are integrated or specifically designed for a use in a KTO environment. As we have seen in the previous chapter, the KTO process involves many types of experts with a different background and needs. Ideally each expert should have access to a user interface designed for the specific need of that type of expert but connected to the information and databases of the other type of expert users.

Addressing Information Challenges: Recommendations and Future Directions

During the ASTP Directors' Forum 2023 in Antwerp, KTO Directors discussed various lessons learned and identified recommendations and future directions to address information challenges and enhance the knowledge transfer process. These include:

RECOMMENDATIONS

1. Acknowledging the complexity of the KT environment.
2. Foster a long-term vision within the organisation.
3. Advocate for standardised reporting and information systems on EU level.
4. Leveraging existing tools and exploring new solutions.
5. Recognising that desired outcomes may not always align with efforts.
6. Collaboration and learning from best practices.
7. Balancing reporting demands from stakeholders with strategic objectives.
8. Providing direct access to KT information.
9. Put someone in charge of data collection and management.
10. Ensuring security and confidentiality.
11. Connecting KT into the broader information management framework.
12. Include tools and information flows in trainings for KT professionals.

1. Acknowledging the complexity of the KT environment.
   The knowledge transfer landscape is complex, with diverse stakeholders, varied objectives, and ever-changing market dynamics. It is crucial for KTOs to acknowledge this complexity and adapt their strategies accordingly. One size does not fit all, and what works for one institution may not work for another. KTO governance and objectives should be tailored to the specific context, political landscape, and industry needs of the organisation. Each institution should be able to design a workflow for its own needs and capabilities. As such a tool to manage this individual workflow is needed.

2. Foster a long-term vision within the organisation.
   Aligning knowledge transfer objectives with the institution's long-term vision and strategic priorities ensures sustained commitment and support from key stakeholders. KTO-professionals are looking for software solutions to tackle organisational problems and complex governance within knowledge institutions. It would be better to first make governance and knowledge exchange more efficient and only then look at an all-encompassing data system. Ideally, you get the whole organisation involved to get a clearer picture of all needs across the units and expertise. Management of a different unit within a knowledge institute can then work together on a vision of an ultimate must-have application. However, implementing such a must-have application will take a lot of work, time, and budget. It is therefore important to have an aligned long-term vision within the entire organisation and that gradually all individual applications grow closer together and will be integrated. Proceed with small but impactful steps.

3. Advocate for standardised reporting and information systems on an EU level.
   A standardised approach to data collection, reporting, and benchmarking would enhance comparability and facilitate knowledge sharing among institutions and countries. Before tools can be developed to monitor impact output, the definitions must first be fine-tuned and agreed on. Standardisation in the requested data for governmental bodies is needed. IT suppliers and governments should partner to have the right definitions agreed on EU-level in their systems.

4. Leveraging existing tools and exploring new solutions.
   KTO professionals utilise a variety of tools to manage and leverage information effectively. Customer Relationship Management (CRM) systems, IP management platforms, contract management solutions, KPIs, surveys, and project management tools are commonly employed. These tools help streamline processes, track progress, and ensure effective communication and collaboration within the KTO and with external partners. However, it is essential to continuously assess the efficacy of these tools, optimise the potential of a tool, and explore innovative solutions that better address the specific information needs of the knowledge transfer process.

5. Recognising that desired outcomes may not always align with efforts.
   KTOs can do everything right and follow best practices, yet still not achieve the desired outcomes. This mismatch between efforts and outcomes often stems from external factors beyond the control of the KTO, such as market conditions, industry demands, or the availability of suitable partners. It is important for KTOs to acknowledge and communicate these challenges transparently to stakeholders. This recognition can lead to a more realistic understanding of the role of KTOs and help manage expectations.

6. Collaboration and learning from best practices.
   The forum highlighted the importance of collaboration among KTOs to share best practices and learn from one another. By fostering a community of knowledge transfer professionals, KTOs can exchange ideas, experiences, and successful strategies. This collaborative approach enables KTOs to stay updated with emerging trends, learn from both successes and failures, and adopt innovative solutions to address information needs more effectively.

7. Balancing reporting demands from stakeholders with strategic objectives.
   KTOs often face demands from various stakeholders, such as faculty members, industry partners, and funding agencies. While it is important to address these demands, KTOs should carefully balance them with their strategic objectives. Giving in to every demand may lead to resource constraints and dilution of efforts. KTOs should proactively engage with stakeholders to manage expectations, educate them about the limitations and constraints, and align their demands with the long-term vision of the organisation.

8. Providing direct access to KT information.
   Instead of providing reports to stakeholders, the KTO could consider providing certain stakeholders with their own access to IT of IP systems. The gained time will offer more concentration of the TTO/KTO team on impact and the administrative colleagues will be allowed to contribute more to the process leading to this impact.

9. Put someone in charge of data collection and management.
   It is crucial to prioritise knowledge exchange and ensure the quality of data within an organisation. Implementing a centralised data cell that represents different units can facilitate coordination and collaboration on data needs and possibilities. This platform can also serve as a space to explain the usefulness of specific data formats. To support this improved data management approach, it is vital for senior management in knowledge institutions and subsidy bodies to allocate sufficient budget and resources. By investing in effective data management, organisations can enhance knowledge transfer, decision-making, and overall operational efficiency.

10. Ensuring security and confidentiality.
    Knowledge transfer involves sensitive and valuable information, including intellectual property and commercialisation strategies. Therefore, it is crucial to prioritise security and confidentiality when managing such information. KTOs should implement robust data protection measures, adhere to relevant regulations (such as GDPR), and establish clear protocols for secure data storage, access, and sharing. Collaborating with information security experts can help KTOs develop best practices in safeguarding information assets.

11. Connecting knowledge transfer into the broader information management framework.
    A recurring topic of discussion during the forum was the role of KTOs in information management. While KTOs play a critical role in collecting, managing, and disseminating knowledge transfer-related information, there was a growing sentiment among the managers regarding the integration of knowledge transfer activities into the broader Information Management (IM) framework of institution. Integrating knowledge transfer into the IM framework may offers several advantages such as a more comprehensive and integrated approach to managing information across the organisation and standardised data collection for reporting. However, it is important to carefully consider the challenges and implications of integrating knowledge transfer into the IM framework. This includes assessing the

existing infrastructure and capabilities of the IM department, establishing clear roles and responsibilities, and fostering collaboration between KTOs and IM professionals. Collaborative efforts should be aimed at striking a balance between the unique requirements of knowledge transfer and the broader institutional information management objectives. Time and effort should be invested to generate APIs and interfaces between the different software tools. Software suppliers should facilitate these types of interactions.

12. Include tools and information flows in trainings for KT professionals.
    Organisation such as ASTP could include standard examples in its training modules of how data flows around IP, licenses, spin-offs, industrial cooperation, impact stories... are optimal managed and which data points are important to follow up and how this data can be generated.

Conclusion

The successful operation of KTOs hinges on their ability to effectively address the information needs of stakeholders and navigate the challenges associated with information management. In this paper, we have explored the diverse information needs during various stages of the knowledge transfer process and discussed the difficulties that arise when information is not recorded properly across various departments. Additionally, we have examined the tools commonly used by KT professionals to overcome these challenges.

Throughout this paper, it has become evident that there is no one-size-fits-all solution when it comes to the governance and objectives of KTOs. Each organisation operates within its unique political landscape, necessitating tailored approaches to information management. As the adage goes, "structure follows strategy." KTOs must align their information strategies with their overall objectives to ensure effective knowledge transfer. This includes recognising the complexities of their environment and actively seeking out best practices and solutions that fit their specific needs.

It is important to note that even with the right strategies and tools in place, KTOs may not always achieve the desired outcomes. Knowledge transfer is a multifaceted process influenced by numerous factors, and success cannot always be guaranteed. However, by continually learning from both successes and failures, KTOs can refine their approaches and enhance their effectiveness over time.

A critical question that arises is whether KTOs should always give in to demands or challenge them. Balancing stakeholder demands with strategic objectives is crucial for maintaining a harmonious and mutually beneficial knowledge transfer ecosystem. KTOs should consider the long-term implications of their decisions and weigh the potential impact on both immediate outcomes and future collaborations.

Another significant challenge faced by KTOs is the design of information systems that are not specifically tailored to the "third mission" of knowledge transfer. While considerable effort is often put into university ranking initiatives, the same level of emphasis may not be placed on developing information systems that facilitate effective knowledge transfer. It is essential to advocate for standardised reporting and information systems on an EU level to streamline processes, enhance collaboration, and ensure comparability across institutions.

The role of KTOs in collecting and disclosing information is a topic of ongoing discussion. There is a need to evaluate whether knowledge transfer activities should be solely under the purview of KTOs or integrated as part of the broader Information Management (IM) department. This integration can enable a more comprehensive approach to information management and ensure that knowledge transfer efforts are aligned with overall institutional goals.

In conclusion, addressing the information needs of KTOs is paramount for successful knowledge transfer. By standardising reporting practices, ensuring the security of sensitive information, and fostering a long-term vision within their organisations, KTOs can enhance their ability to facilitate effective knowledge transfer. It is crucial for KTOs to learn from best practices, leverage existing tools, and remain open to the possibility of developing new tools to overcome information management challenges. By recognising and addressing the information needs of KTOs, stakeholders, and knowledge transfer partners, universities can enhance their ability to drive successful knowledge transfer initiatives and maximise the impact of academic research and innovation.

Appendix 1: Results of ASTP Survey

In the first quarter of 2023, ASTP conducted a survey on data management tools used in KTOs. A total of 270 Directors were contacted, of which 54 responded (20%), and respondents represented KTOs from 25 countries. Sixty-nine percent of respondents already use IT tools to track their internal business and contractual data. Surprisingly, 31% said they do not use IT tools, which was unexpectedly high. Still, 41% of respondents that do not use dedicated software said they were considering implementing IT tools. One must be careful about interpreting this data, as only 20% of the directors contacted responded and the 31% who are not using IT tools may be smaller offices with fewer valorisation files, patents, and agreements to monitor. Based on this preliminary result, the authors of this report recommend implementing this question in the annual ASTP survey so that the use of IT tools can be linked to the size and output of knowledge transfer offices.

If we look to the tools that are used, we see that 13% of the respondents use Wellspring and 13% Inteum, 9% use myIP; 6 % use inhouse made applications and 6% Microsoft applications. 22% of the respondents use other applications such as HubSpot, Salesforce, REDcap, IDEAS, Tableau etc.

The main advantages that were collected based on the survey are the increased time efficiency, instant access to the portfolio data, improved resource and budget management, available information to support decisions, KPI reporting tools, stakeholder management, structured information, ...

The survey revealed also disadvantages such as no access for researchers, limited reporting tools, limited scope of each individual software package, the limited interaction with other software tools and databases, too much standalone approach, the fact that data input is time consuming will lead to garbage in garbage out syndrome, but most of all that the current software is not covering the full knowledge transfer process.

The identified needs were improved integration with other systems, improved connection with the full knowledge transfer process, improved IP-modules, access to tools to monitor impact metrics, improved data modelling and visualisation. Better support for the legal due diligence process and improved financial management tools.

Appendix 2: Conclusions of ASTP Directors' Forum held on 23 February in Antwerp

Dr. Jurgen Joossens head of the **Valorisation Office UAntwerpen (TTO)** stated that improved IT-tools for data management are needed. For example, there is the annual reporting to the government, but also the frequent reporting to the management of the university. Various authorities ask for data during the year and that data must be able to be delivered quickly. The biggest challenge lies in the fact that the data is spread in different formats over different databases and files that are also often managed by other units or even institutions. Instant access to that data is therefore repeatedly difficult. To report, the supplied and available data must be cleaned up manually and put in the correct format. This leads to keeping the same data and documents in different databases. The quality of data is also a major concern. Some data is important for a KTO but is managed by another unit in that considers that aspect of the data less important. As a result, data may be outdated, inaccurate, incomplete, or even incorrect.

Installing a data cell across the different units can contribute to an understanding of each other's needs and should lead to implementing the right queries or entering in the right format. Every (larger) KTO should therefore have a person who is responsible for the quality and management of the data. It is also important that each type of user has a user interface that is useful and understandable for that person. A financial database that we get access to but where the user interface is not suitable for our analyses has little added value. More automation and linking is needed so that data is only entered once and this by the person who understands why this data is important and necessary. Keeping a database up to date is also a big challenge.

In the presentation of **Dr. Petr Kubečka (director STP UP, University Olomouc)**, the importance of a good CRM system was discussed. Often this software tool is not available in a KTO. MS Dynamics is a tool that can facilitate various aspects of our daily work. Within STP UP, it is used to manage patent families. For example, deadlines are kept up to date and the necessary alarms are provided to notify the right people. The advantage of MS Dynamics is that other MS products can be easily integrated. It is also quite easy to personalise the application since many externally or internally people have sufficient knowledge of MS Dynamics. However, resistance is often encountered by people who do not want to work with a standard software package. It would be good if this became a standard package within STP UP throughout the organisation, new tools should also be developed within MS Dynamics that are more attuned to the daily work of a KTO. Points of attention are the budget, dependence on a large software company and impact of internal regulations on use.

It is important that new people can have access to the historical data and background knowledge of the Valorisation cases. Tools such as MS dynamics help to keep this knowledge in the organisation when people are leaving. To coach new colleagues in the KTO checklists were made so that everyone knows which steps to take, who should be informed and what documents and information must be available and stored in the system.

Peter Conlon (Commercialisation Executive, MaynoothWorks, Maynooth University) put forward that many organisations generate data because the funding bodies are requesting for it, and it is important to meet the criteria from these bodies. But do these data still reflect the current reality and needs? Currently endless and multiple spreadsheets for official KTI metrics are generated. The spreadsheets contain often similar data but in different formats. The data come from different databases spread over the organisation. None of the databases are really connected and reports are generated on each individual application. The data are afterwards wrangled into a common format and gaps are infilled with on the ground knowledge. Main bottleneck to integrate systems is the lack of a common data organisation, even sometimes a unique identifier is missing. Most organisations are also lacking a common data transfer protocol.

In the view of Peter Conlon, we should shift from the dogma that a license/spin-off/patent is the end point of a Valorisation trajectory. Opportunities are long-term open-ended potential for impact. During each step of the opportunity management there can be a reporting need. In the process three types of actors are identified: Produces, Consumers and Suppliers these roles can be combined or exchanged. We should aim for flexible but common data structures. A common "language" drives common access of data through an open API definition.

It should be our ambition that consumers of report information have own access and the system must own the IP management operations. The gained time will offer more concentration of the TTO/KTO team on impact and the administrative colleagues will be allowed to contribute more to the process leading to this impact.

Dr. Jacek Kasz (Director Center for Technology Transfer Cracow) put forward that once an organisation grows and units are created that broaden the initial scope, a CRM tool is needed to track all customers, partner organisations, and businesses. Meeting the needs and expectations of all the teams involved is challenging. It should also be borne in mind that many colleagues work with confidential information and that data management must be able to cope with current security needs. Ideally, the IT application should be able to track the entire technological lifecycle management (control and monitoring). For the Center for Technology Transfer (CTT) Cracow it is important that the system is compatible with MS Windows server environment and that the system is affordable. After a tender period, OPTeam was chosen as the optimal provider. The module “Electronic platform for commercialisation of scientific innovation” facilitates cooperation with industry, the implementation of scientific projects, the sharing of the effects of work and technology, and the provision of research and development services. The low-code approach enables faster application delivery through minimal hand coding. The graphical user interface and drag-and-drop features of a low-code platform automate aspects of the development process. Each team within CTT was able to identify assets within the application that meet their specific needs.

The fact that the same database could work with variable and custom user interfaces was a strong plus. The separate functionalities provided tailor-made solutions for the needs of each individual team. At the same time, synergies can be generated between the different teams due to access to common data.

Paul Dillon (Director TTO, University of Limerick) informed the audience that Ireland has gone through a process of standardisation for the reports generated by all Irish research organisations. They set standard conditions for data collection and the annual reports are published. The data can be used in different sectors. The reports are generated by data that comes from different origins and applications. The generated datasets are useful for developing and evaluating strategies. It's very easy to see how your organisation is different or similar compared to organisations in the same sector. You can monitor which type of companies you work with the most, in which sector they are active or where they are located. Nevertheless, some challenges remain in place: (1) Data Governance for data captured from external systems that do not meet current standardisation, (2) Data consistency when experienced personnel leave the organisation, (3) Records management and retention. Record destruction is a real challenge because it is difficult to know how long contracts and documents should be archived after termination.

Liz Kirby (Science and Technology Facilities Council) stated that KTO Data needs are beyond IP Management. At the Science and Technology Facilities Council UK, Inteum is used for IP management and Microsoft 365 as a project management tool (SharePoint, excel, planner). An agreement portal has been created to handle NDAs. This agreement portal made the NDA process much more efficient, and it becomes easy to check the status of agreements. It also generated evidence for resource planning. Additional benefits were access to company data (CRM-like), and you can see who in the organisation works with the same company. Due to the difficult follow-up in Oracle, the financial data is also monitored in Inteum. This was necessary to better monitor the distribution of the royalty income. The contract system lacks a link with the IP management system. The CRM system was developed within MS dynamics but only 1 service has access. Impact case studies are kept in Trello. The follow-up of project financing is now also done in Inteum, but it is a work around and not so elegant.

The big challenge is having good data systems available to monitor Impact. Impact data must be generated on specific questions, reports must be able to be generated directly and individually (for example, external presentations to an external party in a specific domain). Currently, Survey Monkey is used when asking spin-out companies and licensees to complete an annual survey to collect impact data. Spinouts usually respond well; licensees are a more difficult responder. The fact that documents like Excel cannot be uploaded in Survey Monkey prevents STFC from using survey Monkey as a royalty reporting tool. The big plus is that entering data is easy and it is convenient to repeat questions every year. In addition, a digital dataset is generated, but this generates a different data silo.

Christophe Haunold informed us about the recent developments at the **University of Luxembourg**. It is important that the KTO makes other actors in the organisation aware of their needs because otherwise opportunities can be missed in the roll-out of new ICT systems within the organisation. Now myIP runs as the IP management tool, but due to the acquisition by Wellspring, a new purchasing process has selected Inteum as the future application. In addition to the new in-house CRIS application tools such as MS office, Trello and Salesforce are used. As a young and small KTO, we need to build on existing systems. Sometimes we notice barriers due to political issues related to data sharing. Strategic choices (available resources and priorities) will stimulate the selection of data management strategies. A software platform that offers a global insight into research collaboration and partnering would be an interesting asset.