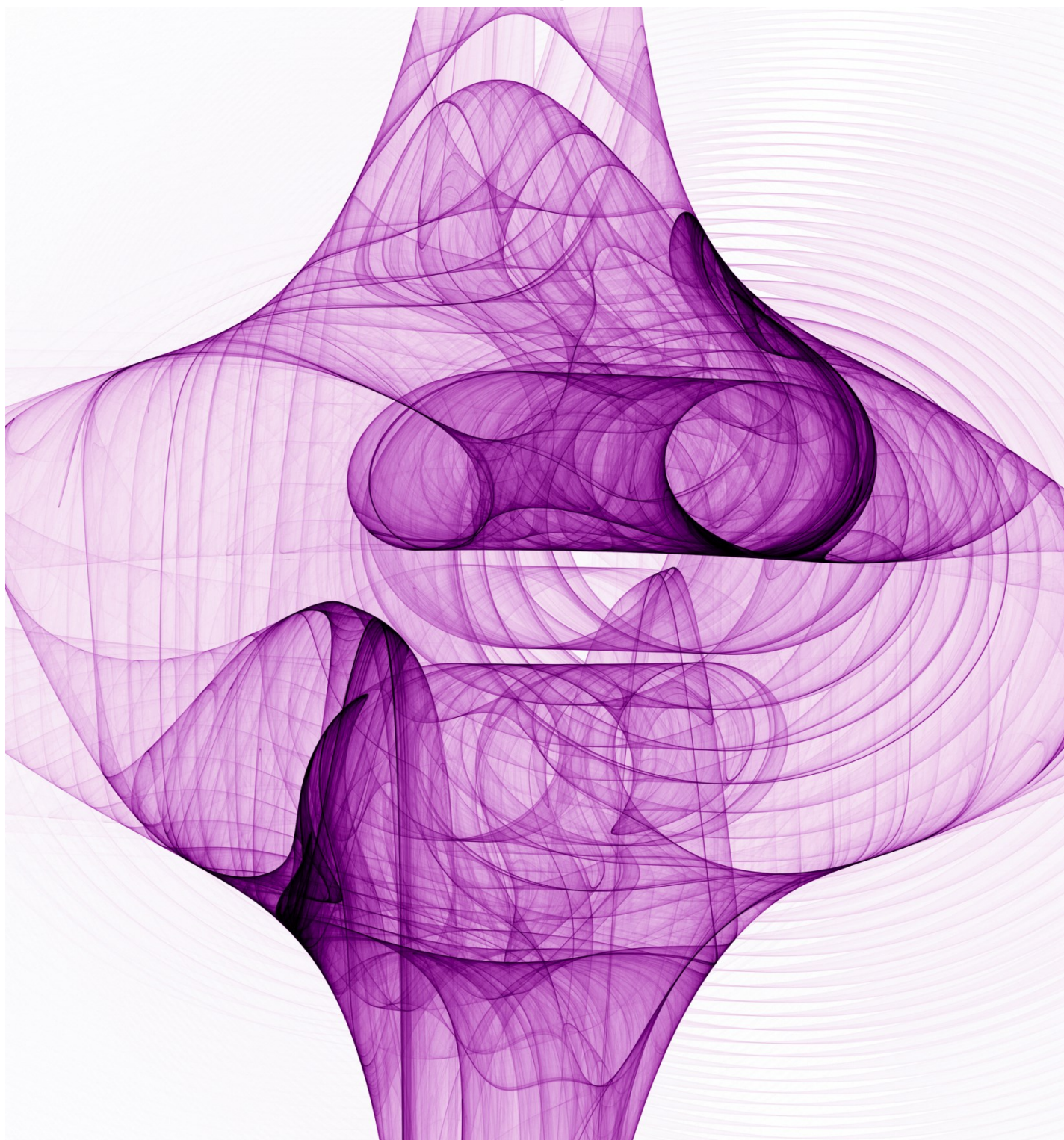


Evaluation of The Inventor Advisory Service



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1. Executive summary

1.1 This evaluation

This document reports on an evaluation of the Inventor Advisory Service. The evaluation is commissioned by the Danish Agency for Science and Technology and Innovation (DASTI) and is conducted by the independent consultancy DAMVAD.

This evaluation addresses three tasks in that it:

Evaluates the organisation, including the means, ends, organisation and user impact of the Inventor Advisory Service, and examines the goal-attainment of the organisation.

Makes recommendations for developing the Inventor Advisory Service as a basis for the upcoming contract negotiations between DASTI and the Inventor Advisory Service.

Develops an impact assessment model for quantifying the economic impact of the Inventor Advisory Service.

The evaluation is based on the following sources of information, referenced throughout the report:

THE EMPIRICAL BASIS OF THE EVALUATION

- All available written documents and statistics on the Inventor Advisory Service.
- Visit to the Inventor Advisory Service and interviews with the director and key employees.
- Interviews with inventors counselled by the Inventor Advisory Service. These include 1) inventors currently receiving counselling, 2) inventors who have successfully sold a license, 3) inventors who have commercialised their idea through other means, and 4) inventors who have abandoned their idea during the counselling process.
- Finally, the report rests on interviews with businesses holding one or more licenses purchased from inventors after counselling by the Inventor Advisory Service.

1.2 The evaluation concludes...

The evaluation finds that the Inventor Advisory Service is:

Well-suited to its purpose with a good alignment of what the Inventor Advisory Service is to achieve and what it does. As described in Chapter 4, licensing is a direct and cost-effective commercialisation pathway for private inventors with limited business experience. This pathway exploits existing production and marketing capacity already present in the economy, and thus provides a good alternative to e.g. entrepreneurship. In addition, as detailed in Chapter 4, the

Inventor Advisory Service is competent and well-suited to its task, and represents a relatively simple and direct means to a clear end: the commercialisation of ideas of private individuals.

Achieves its formal goals, as described in Chapter 4, the purpose of the Inventor Advisory Service is operationalised in a number of formal milestone goals, directed at services rendered, successful commercialisation, communication and visibility and educational services. The Inventor Advisory Service achieves its formal goals and surpasses several of them.

Preliminarily, a sound public investment, but this cannot be empirically shown without an economic impact assessment. The Inventor Advisory Service investigated the value of the 16 most lucrative license agreements it counselled during the period 2000-2009.¹ These generated an annual average turnover of DKK 276 million during the 10-year period investigated. Given the size of the annual public investment in IAS, a decisive role in realising just one of these agreements or a minor role in realising several of them is likely to have created value in excess of the investment made in the IAS. However, as described in Chapter 8 turnover cannot, without reservations, be considered economic impact. In addition, important cost-side considerations must likewise be taken into account. Last, but not least, is the question of whether this value would have been created without intervention from the Inventor Advisory Service. To address these questions, we propose an economic impact assessment model in Chapter 8.

A small and nimble organisation, as described in Chapter 5, the Inventor Advisory Service is a small, nimble and flat organisation. As shown in Chapter 4, the majority of its resources are allocated to initial counselling of inventors. The organisation is sensitive to turnover of key personnel, which is immediately relevant in light of the imminent retirement of several of its most experienced employees.

Part of a fragmented commercialisation support chain. As described in Chapter 6 the Inventor Advisory Service is one among many schemes along the commercialisation chain. The organisation is part of an informal system of references to and from adjacent support schemes. These are not formal or systematic, and rely on personal relations. Overall, the organisation is not part of a “no wrong door” commercialisation chain.

1.3 Three avenues of development

The recommendations are directed at three avenues of development that the evaluator sees for the Inventor Advisory Service, explained in the following:

More ideas into the funnel: One simple avenue of development is to increase the volume of ideas that reach the Inventor Advisory Service. This presupposes a non-declining marginal rate of success of more ideas. The most experienced advisors of the Inventor Advisory Service support this presumption. In their experience, the current success rate of ideas has remained roughly stable throughout the 43-year history of the organisation (it is currently around 1:235). In addition, this is supported by the literature on idea success rates.² Following this rationale, increasing the input of ideas to the Inventor Advisory Service should in principle increase the number of licenses (at least) proportionally. Note that using the data collected as part of the economic impact assessment, it may be possible to empirically test this assumption.

Increasing the idea success rate: A second avenue of development is increasing the success rate of the ideas received by the Inventor Advisory Service. While experience and the literature

¹ IAS (2012a)

² See for example Stevens et al (1997) and Babcock (1996)

speak for a very robust success rate of ideas (see previous), the benefits of increasing the success rate may be substantial. In effect, there may be segments of inventors with a higher-than-average quality of ideas. Increasing the proportion of these in the target group of the Inventor Advisory Service may increase the success rate. Another way to influence the idea success rate is for the Inventor Advisory Service to be more selective (demand more from inventors) before providing initial counselling.

Maximum impact, given limited resources: As a third avenue of development, we raise the question of the prioritisation of limited resources between the three major functions of the Inventor Advisory Service:

1. Education of potential inventors
2. Public service to inventors (initial counselling)
3. Commercialising the most promising ideas (extended counselling)

Currently, the resource allocation is approximately 12, 66, and 22 pct., respectively.³ Could more be achieved with the same budget or could an additional investment yield a disproportionate payoff?

With this in mind, we turn to the recommendations of the evaluation.

1.4 The evaluation recommends...

The recommendations of the evaluation are developed after talking to people in and around the Inventor Advisory Service. The recommendations are, however, fully the responsibility of the evaluation team, and no one else.

The common theme of our recommendations for further developing the Inventor Advisory Service is that of moving resources “downstream” in the value chain – from educating potential inventors, towards commercialising the most promising inventions.

A more focused Education Service: The Education Service is to promote licensing as an alternative to entrepreneurship, as a pathway for realising ideas. Important as this may be, the target group of the Education Service is disproportionately large. The Education Service currently has a target group of 1.25 million students in Denmark in addition to teachers and educators at all educational levels.⁴ Services are provided on a “first come, first served”-basis until the DKK 1 million budget is spent. In this light, we believe that the intervention is out of proportion to its target group. Therefore, we recommend, that one of three courses of action be considered:

- **Focus the Education Service** on the target groups where it makes the most difference to the advisory function of the Inventor Advisory Service, e.g. engineering students, technical students, artisan educations, industrial designers, etc. In this role, the purpose of the Education Service will be that of prompting potential inventors to submit their ideas into the advisory function of the Inventor Advisory Service.
- **Coordinate the Education Service** with other educational services and pool resources to present licensing as an alternative commercialisation pathway nationwide.⁵

³ Based on a total budget of DKK 8,5m, of which 1m goes to the Education Service. The Inventor Advisory Service estimate the division of time between initial and extended counselling to be 75 and 25 pct., respectively (see Chapter 4).

⁴ Statistics Denmark (2014)

⁵ See an example here: <http://Skoletjenestenetvaerk.dk/>

In this role, the current rationale can be sustained, more or less, as it is. However, the current independent organisation of the service should be reconsidered.

- **Train the trainers** and focus the Education Service on teachers and, through them, the students. This would be a way to achieve leverage with the limited resources of the service, considering the comparatively large target group.

Update the online reception tool: As described in Chapter 4, the initial phase of counselling is the most resource-demanding part of the operation of the Inventor Advisory Service. Even a small improvement here will free up significant resources for other functions. The Inventor Advisory Service has already taken a number of initiatives to bring this share down. Among these are:

- Introduction of a “gatekeeper”-role, as described in Chapter 3.
- Development of the inventor’s 10 steps online reception tool to aid first contact with inventors (introduced in 2009).
- Increasing demands for more preparation work from inventors before providing counselling (introduced 2013-2014).

In light of this, we recommend an update of the online reception tool with the specific aim of freeing up resources for use elsewhere (see next recommendation). Here, it should be considered if the Inventor Advisory Service could share a joint portal with other actors in the commercialisation system. One option could be sharing a portal with the Danish Patent and Trademark Office and Young Enterprise Denmark. As described in Chapter 6, the former is currently a close partner of the Inventor Advisory Service. See the recently developed portal here (<http://www.styrkdinide.dk/>).

Prioritise the commercialisation phase: From a socioeconomic viewpoint, commercialisation of the most promising inventions through licensing is the key function of the Inventor Advisory Service. The successful commercialisation of only a few extra licenses each year would mean a large proportional increase in the value added by the Inventor Advisory Service. Therefore, we recommend that additional resources be focused here. Several possibilities present themselves:

- **An expanded IPR-service:** For some businesses, the IPR-question is an important barrier to entering into a license agreement with an inventor. Currently, the Inventor Advisory Service refers inventors to the Danish Patent and Trademark Office, whom, for a minor fee paid by the inventor, conducts a patent search, guided by the inventor. The result of this search is not a definitive answer to whether the invention is truly novel or already protected. Rather, the search yields a stack of related patents, which the inventor must then go through and assess himself. The Inventor Advisory Service has noticed, firstly, that there is significant bias when inventors assess the novelty of their own invention. Secondly, the business is not always inclined to accept the mere judgment of the inventor. Here, an expanded IPR-service, yielding definitive answers, offered to selected inventors could clear the way for a license agreement.
- **Expert assessment of technical feasibility:** When assessing technical feasibility of complicated inventions, there is a significant information asymmetry between the inventor and prospective license-holding businesses. For some inventions, obtaining an independent expert assessment (in paper and signed) of technical feasibility can significantly reduce this barrier.

Outreach to new segments: A broad segment of inventors is already in contact with the Inventor Advisory Service. In addition, the organisation has already prioritised significant

resources and manpower to communication, outreach and community management as described in chapters 4 and 5. We nonetheless recommend that the Inventor Advisory Service considers reaching out to the most promising segments of its target group. Firstly, to increase the number of ideas on its input side, and secondly, to increase the overall success rate of ideas. In line with our earlier recommendation for a more focused Education Service (see above), some possibilities are technical students, certain crafts, industrial designers, technical university students, architects and others. Beyond the ones we can mention here, we recommend that the Inventor Advisory Service consider this question further, using its extensive experience. Who are the promising inventors, whom are not currently clients of the organisation?

2. Dansk sammenfatning

2.1 Evalueringen

Dette dokument indeholder en evaluering af Opfinderrådgivningen. Evalueringen er bestilt af Styrelsen for Forskning og Innovation og er udført af det uafhængige konsulenthus DAMVAD.

Evalueringen indfrier tre formål, idet den:

Evaluerer organisationen, dens mål og midler, organisering, betydning for brugerne og målopnåelse.

Udpeger anbefalinger for at udvikle Opfinderrådgivningen som udgangspunkt for de kommende forhandlinger om en resultatkontrakt mellem Styrelsen for Forskning og Innovation og Opfinderrådgivningen.

Udvikler en økonomisk effektmålingsmodel, der kan kvantificere den økonomiske betydning af Opfinderrådgivningen for samfundet.

Evalueringen er baseret på følgende informationskilder, som refereres til gennem rapporten:

EVALUERINGENS METODISKE GRUNDLAG

- Alle tilgængelige skriftlige afrapporteringer fra og om Opfinderrådgivningen.
- Et fysisk besøg hos Opfinderrådgivningen og interviews med Opfinderrådgivningens ledelse og nøglemedarbejdere.
- Interviews med opfindere, der har modtaget rådgivning. Disse inkluderer; 1) opfindere undervejs i et rådgivningsforløb, 2) opfindere der har solgt et licens, 3) opfindere der har kommercialiseret deres idé på andre måder og 4) opfindere der har droppet deres idé undervejs i rådgivningsprocessen.
- Endelig hviler evalueringen på interviews med virksomheder, der har købt et eller flere licenser fra opfindere efter rådgivning af Opfinderrådgivningen.

2.2 Evalueringen konkluderer...

Evalueringen konkluderer, at Opfinderrådgivningen er:

Veltilpasset til sit formål med en god sammenhæng mellem hvad Opfinderrådgivningen skal opnå og hvad den gør. Som beskrevet i kapitel 4 er licenser en omkostningseffektiv kommercialiseringsmulighed for private opfindere med begrænsede forretningserfaringer. Licensering udnytter produktions- og markedseksperise, der allerede er til stede i økonomien

og er dermed et godt alternativ til f.eks. virksomhedsopstart. Som beskrevet i kapitel 4 er Opfinderrådgivningen desuden kompetent og repræsenterer et relativt simpelt og klart middel til at opnå et mål: at kommercialisere private borgeres idéer.

Opnår sine formelle mål. Som beskrevet i kapitel 4 er Opfinderrådgivningens formål operationaliseret i en række formelle milepæle rettet mod serviceydelser, succesfuld kommercialisering, kommunikation og Skoletjenesten. Evalueringen viser, at Opfinderrådgivningen opnår eller overgår sine formelle mål.

I udgangspunktet en god offentlig investering, men dette kan ikke konkluderes endeligt uden en økonomisk effektundersøgelse. Opfinderrådgivningen undersøgte værdien af de 16 mest værdifulde licensaftaler den rådgav om i perioden 2000-2009.⁶ Disse genererede en årlig gennemsnitlig omsætning på DKK 276 millioner over perioden. Givet størrelsen af den årlige investering i Opfinderrådgivningen vil en afgørende rolle i realiseringen af bare ét af disse licenser (eller en mindre rolle i flere) kunne have tjent denne investering ind. Men som beskrevet i kapitel 8 kan omsætning ikke uden videre betragtes som økonomisk effekt. Herudover må vigtige omkostningselementer tages med i betragtning. Sidst, men ikke mindst, må en økonomisk effektundersøgelse desuden håndtere spørgsmålet om, hvorvidt licenserne ville have været realiseret uden en intervention fra Opfinderrådgivningen. For at adressere disse spørgsmål foreslår evalueringen en model for en økonomisk effektundersøgelse i kapitel 8.

En lille og fleksibel organisation. Som beskrevet i kapitel 5 er Opfinderrådgivningen en lille, fleksibel og flad organisation. Hovedparten af organisationens ressourcer bruges i den indledende rådgivning af opfindere. Organisationen er følsom over for udskiftning af nøgled medarbejdere, hvilket netop nu er aktuelt, i lyset af pensioneringen af flere af dens mest erfarne medarbejdere.

En del af en fragmenteret kommercialiseringskæde. Som beskrevet i kapitel 6 er Opfinderrådgivningen én blandt mange offentlige virkemiddeloperatører langs kommercialiseringskæden. Organisationen er en del af et uformelt system af referencer til og fra sideliggende virkemiddeloperatører. Disse er ikke formelle eller systematiske, men hviler på personlige relationer mellem medarbejdere. Overordnet kan organisationen ikke siges at være en del af et ”no wrong door”-system langs kommercialiseringskæden.

2.3 Tre udviklingsveje

Evalueringens anbefalinger tager udgangspunkt i tre udviklingsveje, som evaluatoren ser for Opfinderrådgivningen.

Flere idéer ind i tragten: En simpel udviklingsvej er at øge volumen af idéer, der når frem til Opfinderrådgivningen. Dette forudsætter, at marginalsuccesraten af idéer ikke falder, hvis antallet af idéer øges. De mest erfarne rådgivere i Opfinderrådgivningen støtter denne antagelse. Deres vurdering er, at den nuværende succesrate har været nogenlunde stabil over organisationens 43-årige historie (succesraten er i øjeblikket 1:235). Antagelsen støttes desuden af litteraturen om idésuccesrater.⁷ Følger vi dette rationale, vil et øget antal idéer, der når frem til Opfinderrådgivningen, i princippet øget antallet af licenser proportionelt. Bemærk at det kan

⁶ IAS (2012a)

⁷ Se f.eks. Stevens et al (1997) og Babcock (1996)

være muligt at teste denne antagelse på baggrund af data indsamlet til den økonomiske effektundersøgelse af Opfinderrådgivningen.

Øge idé-succesraten: En anden udviklingsvej er at øge succesraten af de idéer, der når frem til Opfinderrådgivningen. Selvom erfaringen og litteraturen peger på en robust idésuccesrate (se ovenfor), ville værdien af en øget succesrate være markant. Måske findes der segmenter af opfindere med en højere-end-gennemsnitlig idékvalitet. En anden vej til at øge idésuccesraten er at Opfinderrådgivningen bliver mere selektiv (kræver mere forarbejde af opfindere) før der ydes rådgivning.

Mest muligt ud af ressourcerne: Som en tredje udviklingsvej rejser vi spørgsmålet om prioriteringen af begrænsede ressourcer mellem de tre centrale funktioner i Opfinderrådgivningen:

1. At uddanne potentielle opfindere
2. At yde public service til opfindere
3. At kommercialisere de mest lovende idéer

I øjeblikket er ressourcefordelingen mellem de tre ca. 12, 66 og 22 pct. henholdsvis.⁸

2.4 Evalueringen anbefaler...

Evalueringens anbefalinger er udviklet i dialog med personer i og omkring Opfinderrådgivningen. Anbefalingerne er ikke desto mindre alene evalueringsteamets ansvar.

Den røde tråd i evalueringens anbefalinger for at videreudvikle Opfinderrådgivningen er, at flytte ressourcer "nedstrøms" i værdikæden – fra at uddanne potentielle opfindere til at kommercialisere de mest lovende opfindelser.

En mere fokuseret skoletjeneste: Skoletjenesten skal fremme licensering som alternativ til entreprenørskab, som en mulighed for at realisere idéer. Det er et vigtigt mål, men Skoletjenestens målgruppe er uforholdsmæssigt stor. Skoletjenesten har i øjeblikket en målgruppe på 1,25 millioner elever og studerende i Danmark⁹. Hertil kommer lærere på samtlige uddannelsesniveauer. Skoletjenestens ydelser allokeres efter et "først til mølle"-princip indtil budgettet på 1 million kr. er brugt. Set i det lys vurderer vi, at Skoletjenesten er ude af proportioner med dens målgruppe. Derfor anbefaler vi, at én af tre handlemuligheder overvejes:

- **Fokuser Skoletjenesten** på den eller de målgrupper, hvor den gør størst forskel for rådgivningsfunktionen, f.eks. ingeniørstuderende, tekniske studerende, håndværkstuderende, industrielle designere, el. lign. I denne rolle bliver hovedformålet for Skoletjenesten, at få flere potentielle opfindere til at indsende deres idéer til Opfinderrådgivningens rådgivningsfunktion.
- **Koordiner Skoletjenesten** med andre skoletjenester og saml ressourcerne om at præsentere licensering som alternativ kommercialiseringsvej nationalt.¹⁰ I denne rolle

⁸ Baseret på et samlet årligt budget på 8,5 millioner kr., hvoraf 1 million kr. går til Skoletjenesten, mens fordelingen mellem indledende og udvidet rådgivning er 75 pct. og 25 pct., henholdsvis, se kapitel 4.

⁹ Danmarks Statistisk (2014)

¹⁰ Se et eksempel her: <http://Skoletjenestenetaerk.dk/>

kan Skoletjenestens nuværende rationale fastholdes, men dens uafhængige organisering (separat fra andre skoletjenester) bør genovervejes.

- **Træn trænerne** og fokuser Skoletjenesten på lærere – og nå herigennem ud til de studerende. Dette kan være en måde at opnå gearing af Skoletjenestens begrænsede ressourcer, givet den meget store målgruppe.

Opdater online-modtagerportalen: Som beskrevet i kapitel 4 er den indledende rådgivning den mest ressourcekrævende funktion i Opfinderrådgivningen. Selv en lille effektivisering her vil frigøre ressourcer til andre funktioner. Opfinderrådgivningen har allerede taget flere initiativer for at effektivisere den indledende rådgivningsfunktion, heriblandt:

- Etablering af en "gate keeper"-rolle, som beskrevet i kapitel 5
- Udvikling af "Opfinderens 10 trin", en online modtagerportal for at facilitere første kontakt med opfindere (introduceret i 2009).
- Højere krav om mere forarbejde fra opfindere før der ydes rådgivning (introduceret 2013-2014).

Med dette udgangspunkt anbefaler vi en opdatering af Opfinderrådgivningens online modtagerportal med det specifikke formål at frigøre ressourcer til andre ting (se næste anbefaling). Her bør det overvejes om Opfinderrådgivningen kunne dele en portal med andre virkemiddeloperatører i kommercialiseringskæden. Én mulighed kunne være fælles udnyttelse af den portal, der netop er udviklet af Patent- og Varemærkestyrelsen og Fonden for Entreprenørskab. Som beskrevet i kapitel 6 er førstnævnte en tæt partner for Opfinderrådgivningen. Se portalen her: <http://www.styrkdinide.dk/>.

Prioriter kommercialiseringsfasen: Fra et samfundsøkonomisk perspektiv er kommercialiseringen af de mest lovende opfindelser gennem licensering kernefunktionen i Opfinderrådgivningen. Succesfuld kommercialisering af blot få ekstra licenser hvert år vil medføre en stor proportionel stigning i Opfinderrådgivningens værditilførsel. Derfor anbefaler vi, at flere ressourcer fokuseres her. Her findes flere muligheder:

- **En udvidet IPR-service:** For nogle virksomheder er IPR-spørgsmålet en væsentlig barriere for at indgå en licensaftale med en opfinder. I øjeblikket refererer Opfinderrådgivningen til Patent- og Varemærkestyrelsen, som, for en mindre betaling gennemfører en patentsøgning vejledt af opfinderen (en såkaldt dialogsøgning). Resultatet af søgningen er dog ikke et definitivt svar på om opfindelsen er ny eller allerede findes. Søgningen genererer derimod en stak patenter, som opfinderen herefter selv må gennemgå og vurdere. Opfinderrådgivningen har bemærket, at opfindere ofte mangler uvildighed når de skal vurdere nyhedsværdien af deres egen opfindelse. Desuden er virksomheder ikke altid klar til at acceptere opfinderens egen vurdering af IPR-spørgsmålet. Her vil en udvidet IPR-service rettet mod et definitivt og uvildigt svar bane vejen for nogle opfindere.
- **Ekspertvurdering af teknisk feasibility:** Særligt for teknisk komplicerede opfindelser er informationsasymetrien mellem opfinder og virksomhed stor. For nogle opfindere kan det derfor være en fordel at få en uafhængig ekspertvurdering af opfindelsens tekniske feasibility (underskrevet og på papir), for at reducere denne barriere.

Outreach og nye segmenter: Et bredt segment af opfindere er allerede i kontakt med Opfinderrådgivningen. Herudover har organisationen allerede prioriteret væsentlige ressourcer til kommunikation, outreach og community management, som beskrevet i kapitel 4 og 5. Vi anbefaler ikke desto mindre, at Opfinderrådgivningen overvejer at række ud til de mest lovende opfindere i dens målgruppe. For det første for at øge antallet af idéer der når frem til Opfinderrådgivningen og for det andet for at øge den overordnede idé-succesrate. I forlængelse af vores tidligere anbefaling om en mere fokuseret skoletjeneste (se ovenfor), er tekniske studenter, visse håndværk, industrielle designere, ingeniørstuderende og andre måske gode muligheder. Ud over dem vi kan nævne her, anbefaler vi at Opfinderrådgivningen selv overvejer dette spørgsmål, med afsæt i sin betragtelige erfaring med opfinderne. Hvem er de mest lovende opfindere, som Opfinderrådgivningen endnu ikke hører fra?

3. Introduction

This document reports on an evaluation of the Inventor Advisory Service. The evaluation is commissioned by the Danish Agency for Science, Technology and Innovation and is conducted by the independent consultancy DAMVAD.

3.1 The organisation at a glance

The Inventor Advisory Service (IAS) is a publicly funded program that offers free counselling to private inventors on how to commercialise their invention. From the outset, the aim of the IAS has been to offer assistance, support and advice to Danish citizens who have ideas with a commercial potential and to provide assistance as needed to commercialise their ideas through licensing to existing companies.

The program was initiated in 1972 and has since then been funded by the Danish Agency for Science, Technology and Innovation (DASTI) and administered by Centre for Ideas & Innovation at the Danish Technological Institute (DTI). DASTI has contracted the IAS to DTI. Currently, the IAS's annual budget is DKK 8.5 million and the IAS currently employs eight people¹¹.

The IAS is part of the Danish innovation system and targets and leverages citizens' ideas nationwide. Each year the IAS consults more than 5.000 prospective inventors and counsels on the development of approximately 1.000 ideas. This leads to about 10-12 license agreements a year as well as creating a learning experience for inventors during the advisory on their invention.

Complementary to the IAS, the program encompasses an Education Service which is an education and training program that each year trains about 2.000 students and teachers across the Danish educational system. Focal for the Education Service is a practical hands-on approach to working with idea development and idea validation through prototyping, visualisation and user involvement.

3.2 This evaluation

This evaluation addresses three tasks in that it:

Evaluates the organisation, including the means, ends, organisation and user impact of the IAS and examines the goal attainment of the organisation.

Makes recommendations for developing the IAS as a basis for the upcoming contract negotiations between DASTI and the IAS.

¹¹ Read more at www.opfind.nu

Develops an impact assessment model for quantifying the economic impact of the IAS.

The evaluation is based on the following sources of information referenced throughout the report.

BOX 1: THE EMPIRICAL BASIS OF THE EVALUATION

- All available written documents and statistics on the IAS.
- Visit to the IAS and interviews with the director and key employees.
- Interviews with inventors counselled by the IAS. These include 1) inventors currently receiving counselling, 2) inventors who have successfully sold a license, 3) inventors who have commercialised their idea through other means, and 4) inventors who have abandoned their idea during the counselling process.
- Finally, the report rests on interviews with businesses holding one or more licenses purchased from inventors after counselling by the IAS.

The evaluation contains six chapters. **Chapter 3** answers what an inventor advisory service is and the rationale behind this type of organisation. **Chapter 4** assesses the means and ends of the IAS and the goal attainment of the organisation, while **Chapter 5** assesses the competencies of the IAS. **Chapter 6** assesses the role of the IAS in the wider support system for commercialisation in Denmark. In closing, **Chapter 7** makes a number of recommendations for further developing the IAS, and finally **Chapter 8** lays out a detailed impact measurement model.

4. Means and ends

In this chapter, we examine the goals, results, activities and users of the Inventor Advisory Service

4.1 Licensing as commercialisation pathway

A characteristic feature of the IAS is its near-exclusive focus on licensing as commercialisation pathway for inventors. Some inventors counselled by the IAS may decide on other means of commercialising their invention. These are referred to other programmes, when relevant.¹²

BOX 2: WHAT IS A LICENSE AGREEMENT?

A license agreement involves a technology owner (in this case an inventor) receiving a license fee (called a royalty) in return for granting access to a business to a technology.

Trott (2008)

A key feature of a licence agreement is that the inventor retains the basic rights to the invention, but sells a limited right to commercial exploitation to a business.

For the clients of the IAS, however, licensing is largely an alternative to starting a new business. Licensing can be a good alternative seen from the perspectives of inventors, businesses and society for reasons explained below.

For inventors, licensing is an opportunity to “outsource” production, logistics, marketing, sales, distribution and service to an existing business, thus eliminating the need to undertake these tasks themselves. This reduces risk, capital, expertise and time needed to capitalise on the invention. In return for handing over the exploitation rights, the inventors limit their revenue to a royalty for these advantages, which is usually a percentage of the business’ turnover.

For businesses, licensing provides access to commercially attractive inventions, which suits their existing infrastructure, business model and clients. Licensing thus expands the developer population beyond the business itself, reduces development time, and lowers risk associated with early stage idea development. In addition, by “sourcing in” inventions through licensing, a business reduces the risk of technological obsolescence caused by an external start-up.

For society, licensing lowers the barriers to technological renewal by incentivising mutual specialisation and division of expertise and labour between those with the ability to invent and those with the ability to produce and sell. Secondly, licensing incentivises and exploits self-

¹² See Chapter 6

organisation between inventors and producers finding their own “optimal” or at least sufficient match.

4.2 Counselling as a public investment

The rationale behind counselling inventors as a public investment is that the licensing of new ideas benefits not only the inventor and the business, but also the wider economy. Investing public money in lowering transaction costs between inventors and businesses can therefore be a good investment of society’s resources by exploiting a so-called *positive externality*.

The idea is that the transaction between inventors and businesses is undervalued by the market because of a number of problems, not automatically corrected by a self-organising market.

Valley of death. Firstly, inventors do not always have the knowledge and skills needed to realise an idea. Here, counselling can add value by realising good ideas that would otherwise be delayed or abandoned. This is also called *the “valley of death”-problem*.

Early plug-pulling. Some inventors overestimate the novelty and value of their idea, and consequently overinvest not only their time and money in its development, but possibly businesses’ as well. We call this the *early plug-pulling problem*. Here, counselling during the early stages of idea development can possibly avoid the misallocation of resources on “bad ideas”.

Information asymmetry. In addition, counselling can lower the information barrier between an inventor and a business, by improving the communication of inventors’ ideas to a business. This reduces the risk to the business and thus reduces reluctance to licensing. This problem is also called *information asymmetry*.

Inventor’s dilemma. Further, an inventor runs a risk of losing the rights to his or her invention when introducing it to a potential business, which may copy it without a license. This problem is also called *inventors’ dilemma*. Here, counselling can reduce this risk to the inventor e.g. by providing a non-disclosure agreement.

The role and impact of counselling in addressing these problems with respect to inventors have not been systematically investigated in the scientific literature. We do know that advice can positively affect entrepreneurs receiving external counselling before, during and after start-up. Specifically, entrepreneur survival and turnover increase because of counselling. See e.g. Rotger et al. (2010), Chrisman et. al. (2005), Wren et al. (2002), and Robson et al (2000). “Counselling” in these studies may span a wide spectrum of topics, such as finance, marketing, strategy, recruiting, management, etc.

BOX 3: CLARITY OF TERMS

We define an innovation as an implemented invention.

Innovation – an implemented result

An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.

OECD (2005)

Invention – a creative act

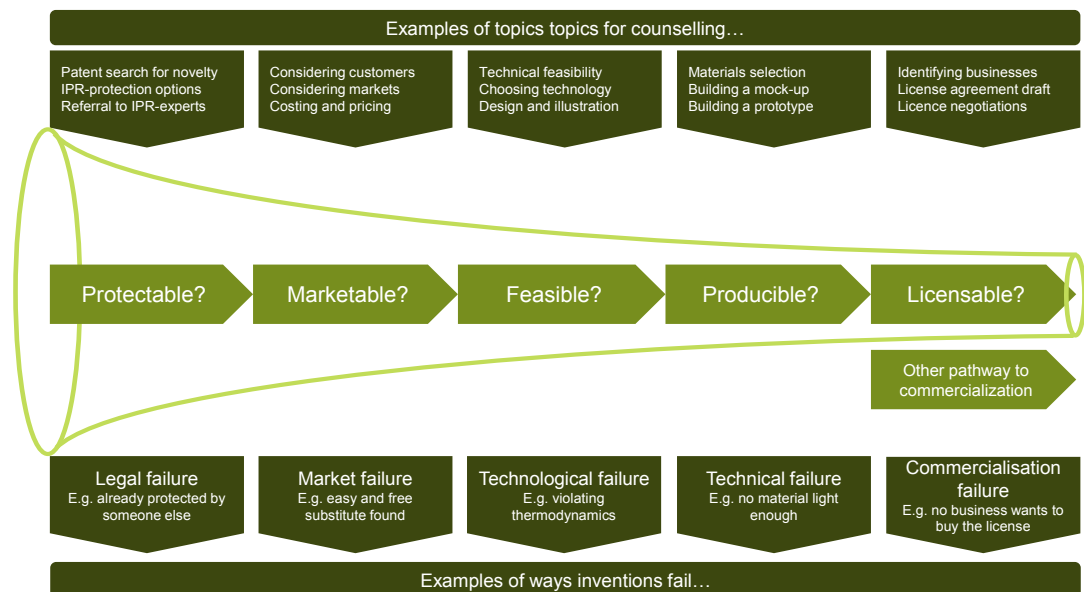
An invention is the act of creating a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations, before its (possible) implementation.

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4.3 The service concept

All services provided by the IAS are “help to self-help”. In this respect, the inventor drives his or her own commercialisation process.

Figure 4.1 An overview of the types of counselling offered by the IAS



Source: DAMVAD 2015

Note: The order in which services are offered often deviate from the linear flow depicted here.

The services of the IAS can be seen as a series of “development tests”, that an invention either 1) fails, 2) passes or 3) is developed to pass through counselling. The principle is illustrated in

figure 4.1. The sequence of “tests” is almost never linear. Any and all of these can be the subject of both initial and extended counselling, as explained below.

Initial counselling: while a few requests are handled by email or telephone, the IAS has one standardised online entrance for inventors seeking counselling on their idea. This online tool is called “the 10 step model” and is available at www.opfind.nu. Note that the 10 steps are a breakdown of the tests illustrated in figure 4.1 in addition to registration of the inventor. Through the ten steps, inventors register, describe the idea and are led through preliminary considerations about the relevant IPR, markets, technology and prototyping of the invention. This effectively functions as a preliminary sorting of ideas and is the basis for selecting the most promising ideas for extended counselling. Here, advisors at the IAS seek to let the inventors themselves “disqualify” flawed ideas, by discovering their shortcomings (e.g. already invented, technically infeasible, or no viable market). This limits discouragement to invent in the future and ideally completes a learning loop, making inventors more capable idea makers (see e.g. serial and professional inventors in the next section).

Extended counselling: Inventors with the most promising ideas subsequently receive so-called extended counselling. “Most promising” means inventions, which either already pass or can be developed to pass the five tests in the advisory concept (see figure 4.1). These “tests” are formulated as questions to be answered by the inventor at www.opfind.nu. There are no standardised requirements qualifying ideas for extended counselling, but informally there are two:

- Ideas have to be fully described by the inventor on the parameters in figure (4.1).
- The IAS has to consider the idea promising and be able to move the idea forward.

At this stage, the idea is approved for extended counselling. This is highly customised advice on developing the invention towards commercialisation. Here, the inventor is assigned a single advisor and counselling is tailored to overcoming obstacles to commercialisation that are particular to the individual inventor or idea, as illustrated in figure 4.1.

As part of the evaluation, we have interviewed four groups of users of the IAS: 1) inventors currently receiving counselling (both extended and initial), 2) inventors who have successfully sold a license, 3) inventors who have commercialised their idea through other means, and 4) inventors who have abandoned their idea during the counselling process. In addition, we have interviewed 5) license-holding businesses.¹³

The Education Service: The Education Service is offering education and training for educational institutions (both teachers and students at all levels). The Education Service’s approach to working with entrepreneurship and innovation is distinctly practical. Inspired by creativity theory and innovative didactics, the training aims at giving teachers and students a transformative learning experience. The Education Service employs practical methods and tools aimed especially at the early stages of idea generation and idea validation. Students and teachers are trained to identify new areas of innovation and to translate these into relevant concept development through a practical, hands-on approach often using the FabLab TI workshop¹⁴ as base for model and prototype building¹⁵. Training is typically based on real life

¹³ See appendix 1

¹⁴ “FabLab” is short for Fabrication Laboratory, a facility in which inventors can build (or 3D print) their first mock-up or working prototype, paying for the use of materials.

challenges sourced from local businesses or organisations. The aim is both motivational impact as well increased collaboration between educational institutions and the surrounding society. In 2014, the Education Service made 61 events, involving 2.297 students.

BOX 4: IMPRESSIONS FROM INVENTORS

- Initial counselling: Some inventors are critical of this part of the counselling and describe it as "a bucket of cold water", when the IAS advice inventors to drop an idea that they consider infeasible. Some inventors insist on carrying on in spite of this.
 - Advice on protectability: This is an area of advice where many inventors indicate that advice made a significant difference.
 - Advice on marketing: Here, the contacts to businesses are a particularly important aspect of the advice inventors receive. One important distinction emphasised by inventors is the difference between businesses with the ability to produce the invention and businesses with a product line into which the invention fits.
 - Advice on producability and feasibility: Many inventors have already developed a mock-up or prototype of their idea by the time they make contact with the IAS. Inventors nonetheless find the Fablab facility a good opportunity to significantly improve on their existing model.
 - Advice on licensing: Many inventors emphasise the value of the help they receive from the IAS with contacting potential license-holding businesses. Inventors feel poorly prepared for this part of the commercialisation process. In addition, the experience and "name" of the IAS opens doors that might otherwise have been closed to them.
-
-

BOX 5: IMPRESSIONS FROM USERS OF THE EDUCATION SERVICE

"It is great that an opportunity as the Education Service exists. I could, in some way, do the things they do, but it would never have the same effects on the students. It has a huge effect that it is someone from 'outside' that tells them these things. The 'external' factor really means a lot. It is fantastic that we can enrich the teaching for free! Because we do not have a lot of money"

"Education in innovation is relatively new, which means that teachers are bound to invent the content of the teaching. The Education Service has helped us to set the tone for this in terms of practical methods, structure, and effective use of time frames and deadlines"

¹⁵ Read more about Fablab TI at [DTI](#)

“We have specifically had positive experiences in relation to working a totally different environment that brings in other approaches. This has contributed to a high level of professional inspiration. (...) The practical hands-on approach has also meant that it has been necessary for the teachers to mediate between the representatives from Education Service and pupils at a more pedagogical level”

4.4 The inventors and the businesses

The IAS counsels about 1.000 unique inventions annually. This target group is limited by the mandate of the IAS, specifying two criteria: they have to be private individuals (not businesses) and with a licence agreement as the intended commercialisation pathway. However, ideas are sometimes commercialised or utilised through other means.

Drawing upon the experiences of the advisors of the IAS and interviews with inventors themselves, we can distinguish six types of inventors described in the box below. This typology is not exhaustive and overlaps occur.¹⁶

BOX 6: SIX TYPES OF INVENTORS

- The hobby inventor, whose invention is motivated by an everyday problem and who has limited or no experience with idea development and commercialisation.
- The specialist inventor, whose invention is inspired by problems arising in a specialised profession, (e.g. production, carpenting, healthcare, etc.). This type of inventor is technically highly experienced but with varying experience with commercialisation.
- The seasonal inventor, whose idea is a response to a seasonal event (e.g. flooding of cellars, winter bicycle lighting, removing fallen leaves, etc.), and with varying experience in commercialisation.
- The professional inventor, whose idea is considered a commercial product and targets the commercial market. This type of inventor is typically experienced with commercialisation and has developed his or her idea far before contacting the IAS.
- The serial inventor, overlapping with the earlier ones, but who proposes several ideas in succession and sometimes in varying fields.
- The student inventor, who as part of a school project, master thesis or because prompted by the Educations Service proposes ideas to the IAS.

Source: DAMVAD 2015

¹⁶ In addition to these, we will mention a seventh and relatively rare type sometimes encountered by the IAS: **the fantast inventor**, who submits elaborate and highly detailed technical designs for very complicated inventions, usually in violation of known physical principles, e.g. perpetual motion engines,

We include some examples of inventors' experiences below.

EXAMPLES OF INVENTOR'S EXPERIENCES

The value of a non-disclosure agreement

One inventor interviewed had worked with children for ten years. During this time, he saw that children repeatedly lost their gloves when they were playing outside. The inventor worked on the problem on and off for many years. He started to develop prototypes, but without any noticeable progress. He realised he had to team up with someone who had experience with marketing. He started contacting several cloth distributors but they did not seem too interested. At the same time, he was not willing to share too much of the idea to convince the distributors. He emailed a lawyer to ask for help but the lawyer gave only short not very precise answers. One day he heard about the IAS in a television program. He visited the homepage www.opfind.nu and ended up contacting the IAS by telephone. The IAS could tell him that his idea was well developed and there was a market for his invention. At the first meeting with the IAS they discussed a non-disclosure agreement and how the inventor should approach companies with the idea. One week later, he had a new meeting with a company and IAS aided the inventor in making a non-disclosure agreement. The IAS was present at more than 10 meetings between the inventor and various companies. According to the inventor: "And this most definitely accelerated the process. It is hard to say if I would have sold the glove without them, but I am sure I would not have gotten so far so fast". Today the inventor has sold a license to a production company in Denmark.

Foreign talent

Two inventors from Bulgaria came to Denmark years ago. One of them, an engineer, came up with an idea for a more flexible mechanical link for chairs. They were not very aware of the possibilities and assistance inventors can get in Denmark. "We browsed the Internet and IAS did cross our way. But we did not pay any attention to it, we thought: A free public offer for inventors cannot be very good". They knew about patents and thought this was the only way you could approach a company, and at the same time have your idea protected. They contacted a patent agent and spent a significant amount of money on his services. They then contacted the IAS. The IAS helped them develop the idea; from branding, prototyping to licensing. The inventors indicated that they spent too much money too early on patenting. What they should have done was to make a non-disclosure agreement. Patents might still be the right way for them but they might also sell their idea through a license.

A persistent serial inventor

25 different ideas in 30 years is the extent of one inventor's contact with the IAS. Often, his ideas survived the first steps in the 10-step program. In many cases, the IAS established contact with companies, which could be potential buyers of his ideas. The latest idea was an optimised generator for windmills. Unfortunately, none of his ideas have turned into a license. When asked why he repeatedly contacts the IAS, he

says, “They have always taken their time to deal with my ideas. I feel like they take me seriously. In addition, the IAS has a great understanding of many different fields, and they possess a huge amount of information material. Unfortunately, the last couple of times I have contacted them, they ask me to reconsider my application as many of my previous ideas turned out to nothing.”

The importance of an impartial second opinion

An interviewed inventor makes a living from selling ideas and he has been in contact with IAS numerous times. In addition to non-disclosure agreements and advice concerning protectability he especially appreciates the ‘second opinion’ that the IAS can provide early in the idea generation: “8 out of 9 times, I realise that the idea is not worth chasing. Sometimes I realise this just by browsing their webpage, other times I realise it after personal contact with one of the employees.” Together with the IAS, the inventor has a greater opportunity to screen his ideas and he states that this collaboration allows him to work more efficiently with the ideas that have a potential for commercialisation.

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In 2014, 22 licenses, all the result of extended counselling, were purchased by businesses. We have interviewed five of these for the evaluation. The businesses purchasing licenses have primarily felt the involvement of the IAS during first contact with the inventor.

Here, the IAS had suggested the business to the inventor, helped set up the meeting and had helped the inventor with the legal documents (non-disclosure agreement) for the initial meeting.

BOX 7: EXAMPLES FROM LICENSE-HOLDING BUSINESSES

One company in the market for kitchen equipment has had several inventors referred to it from the IAS. For the most part, the initial contact was made by advisors from the IAS, mentioning that they had an interesting invention, possibly of interest to the company. For the business, the involvement of the IAS meant that the idea has already passed through the “first filters” and is worth spending time on. In addition, the business emphasises that through the IAS, it sees many more interesting ideas than it would otherwise have access to. The business is aware that the IAS acts in the interest of inventors, but it played a very constructive role throughout license negotiations, attending meetings, preparing legal documents and steering the process in the right direction.

A dedicated product development company had multiple contacts from inventors, and was not quite sure how many of them were instigated by the IAS. The business estimates that only 5-10 pct. of inventions are production worthy. Therefore, the initial “sorting” done by the IAS is very valuable. The involvement of the IAS Council usually signifies that the idea is worth looking into. During negotiations, the business considers the involvement of the IAS instrumental in reaching agreement on a license. The IAS prepared the groundwork and made negotiations much easier.

A hardware company was contacted by the IAS about an idea very close to the production-stage. The business found the involvement of the IAS very important in creating trust between the business and the inventor. Here, advisors from the IAS mediated between the business and the inventor and brokered a license agreement. The advisor dedicated to advancing the idea was described as creating a trusting atmosphere and as extremely competent and well prepared. This greatly aided the process.

Source: DAMVAD 2015

4.5 Goals and their achievement

In the following, we examine the goals and the goal achievement of the IAS. In short: the IAS achieves its formal goals.

Stated purposes: The IAS serves two main purposes:

- To further commercialisation of the ideas of individual inventors for the benefit of inventors and private businesses.
- To promote an open culture for trading rights and licenses so that more unexploited ideas are used and commercialised.

In addition to counselling inventors, the IAS offers education on invention directed at students at educational institutions. The Education Service has two main purposes:

- Introduce practical tools aimed at creating good ideas, developing them and making them useful
- Develop skills of both teachers and students needed to identify areas of innovation and to realise these through a hands-on approach to idea generation.

Formal milestones: These broader “purposes” are operationalised in formal milestones. The formal milestones of the IAS are negotiated with the Danish Agency for Science Technology and Innovation on a three-year basis. These are summarised in the box below.

Commercialisation goals achieved: As described below, the first two formal milestones are directed at services rendered with the aim of commercialisation. Before 2013, an advisory board had to approve ideas before extended counselling. From 2013 and forward, IAS has been making this decision itself, providing extended counselling to significantly more inventors (see section on extended counselling on page 18).¹⁷ This has made the transition between initial and extended counselling more fluid.

¹⁷ The IAS considers this a significant advantage, as ideas are not now “held up” by pending advisory council decisions.

BOX 8: MILESTONES FOR THE PERIOD 2013-2015

Milestones for counselling:

- Extended counselling on 40 inventions, leading to commercialisation of 23 inventions, either through licensing or other means of commercialisation.
- All requests on initial counselling (about 3.000 through the period) will be handled professionally and to a uniform standard, albeit with flexibility that inventors are expected to sufficiently qualify their idea and submit it through the online format.
- Strong communication of the services offered by the Inventor Advisory Service and its results, including visible presence on relevant social media platforms.
- Ensure that a significant proportion of inventions origin from new users.

Milestones for the Education Service:

- 1.500 students have received a tailor made Education service
- 50 advisory services to students via email
- 100 advisory sessions with students via chat

Source: DASTI (2013)

As shown in table 4.1 the IAS achieves most¹⁸ of its formal commercialisation goals:

Table 4.1 Overview of counselling services 2010-2014

	Initial counselling	Extended counselling	Licenses and utilisations
2010	992	17	6
2011	912	12*	15*
2012	1054	12	3
2013	966	14	10
2014	702	80	22

Source: DAMVAD 2015 Based on annual reports

Note:* Number of licenses exceeded extended counselling in this year because extended counselling from the previous year led to licensing in the subsequent year. The 2013 figure is underestimated, as informal contacts by email and phone was not counted, while the 2014 figure is accurate (although lower, due to increasing demands on inventors).

Communication goals achieved: While the commercialisation goals are quantitative threshold-goals, which can be easily verified, the communications milestone is of a softer nature. Based on a complete overview of the communication activities of the IAS we consider this goal achieved. The organisation is active on all major social media platforms, in media and at events throughout the country. In 2014, the Inventor Advisory Service published 20 blogs on www.opfind.nu in addition to blogs at <http://ing.dk/sog/Opfinderbloggen> and regular updates on Facebook, Twitter and Instagram and other inventor-oriented websites. Further, the IAS published videos directed at inventors at <http://vimeo.com/opfindnu>.¹⁹

¹⁸ The final number of initial counselling services for the 2013-2015 period is not yet known, but with an average of 925 per year, the projected number will be around 2600 for the total three-year period.

¹⁹ IAS (2014a)

In addition, the IAS employs a “Community manager” (effectively a journalist), dedicated to outreach activities. More on this in the next chapter.

New users: There are returning users of the IAS (see e.g. serial inventors above). In addition, the IAS has a network of businesses that multiple inventors are referred to over time. This is likely an advantage to both inventors and businesses. However, by far the majority of users are first-time users: In 2012, 2013 and 2014, new users represented 81, 85 and 87 pct. of inventors receiving initial counselling, respectively.²⁰

The Education Service: An overview of the activities of the Education Service shows that the IAS reached 2.279 students in 2014 alone. This includes contacts by email and chat.²¹ With this in mind, we consider this goal achieved.

In addition to these activities, the IAS has functioned as jury member in idea competitions and has also been involved in supporting a number of events within ideation, innovation, entrepreneurship, etc., which cannot be directly related to its goals.

²⁰ Figures from the IAS user database.

²¹ IAS (2014b)

5. People and organisation

In this chapter, we examine the organisation, competencies and operations of the Inventor Advisory Service.

5.1 Located at DTI

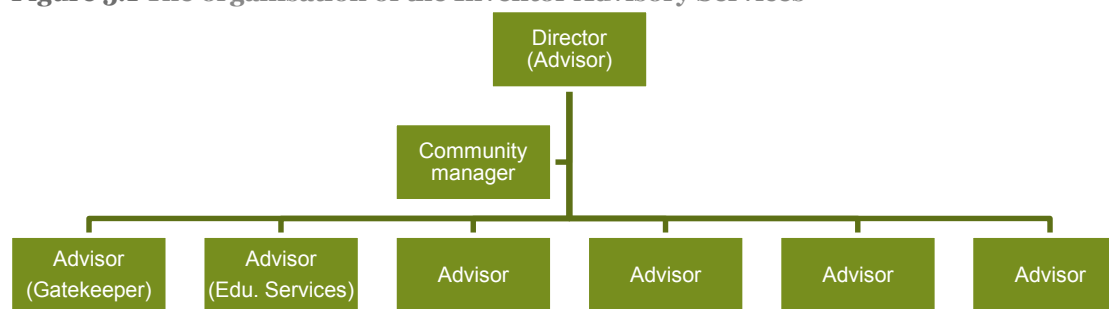
The IAS is a part of the Danish Technological Institute (DTI). The DTI is a self-financed organisation, which is part of the Danish GTS-Institutes (<http://en.gts-net.dk/>). DTI offers technical services (advice, expertise, development, testing, certification and more) to businesses developing new products.

The location at DTI: As part of this evaluation, we have interviewed the director of business development at DTI. Based on this, the IAS seems well situated at DTI. Cooperation is contractual and well-established. The IAS draws upon other departments at DTI in its work. DTI also provides the opportunity to refer inventors to deeper technical expertise than can realistically be found in the IAS. The IAS is a well-known name at DTI and seems well integrated into the organisation.

5.2 The organisation

The IAS is comprised of a director and seven employees. The organisation and its division of roles are depicted in figure 5.1 below. The organisation is small, flat and informal, but with a specified division of roles.

Figure 5.1 The organisation of the Inventor Advisory Services



Source: DAMVAD 2015

Beyond its director, the organisation is comprised of five advisors, one Education Service leader and one community manager. All advisors participate in Education Service activities. One advisor serves as “gate keeper” and handles “first contact” with the users of the IAS. More on this below.

In addition, the IAS employs a journalist in the dedicated role of “community manager”, in charge of outreach and presence on social media.

5.3 Skills and competencies

As shown in figure 5.1, the IAS is composed of eight people in total. The qualifications of the employees reflect the fact, that there is no “formal” education as a counsellor of inventors.

Backgrounds include a biologist, an engineer and an industrial designer. These all have experience from previous employments. In addition, two advisors have more than 30 years of experience advising inventors. The overall profile of the advisors covers a broad spectrum of competencies; however, given the limited size of the organisation, it is not realistic that there is a 1-1 match between the technical aspects of an idea and the advisor assigned to it. Therefore, the most important competency of advisors is recognition of the potential of an idea and the ability to support the process towards commercialisation.

BOX 9: OVERVIEW OF EMPLOYEES

- A director, managing the daily operations of the organisation
- A gatekeeper, an advisor, handling all initial contacts from inventors and distributes tasks
- One community manager, a journalist
- Four dedicated advisors,
- One advisor assigned to Education services

Source: DAMVAD 2015

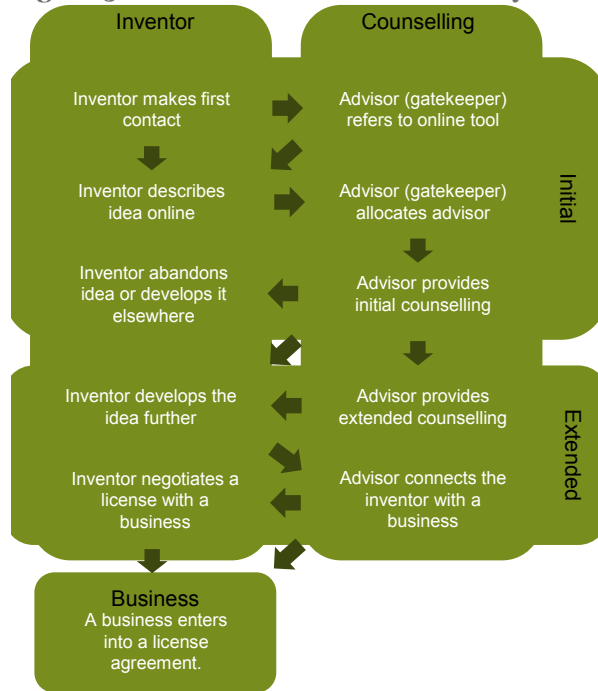
Employee turnover: The two advisors with the greatest experience will retire over the coming years. The director of the IAS is currently looking for replacements and is optimistic about finding suitable replacements in due time. The most direct consequence concerns the gatekeeper function, which will be shared between advisors in the short term. The longer term solution will depend on a possible update of the online reception tool, which may change the way the IAS handles “first contact” with inventors and distributes advisory tasks subsequently.

5.4 Operations and workflow

The operation of the IAS is informal and tasks are flexibly divided between advisors based on interest, available resources and competency, as inventors make contact.

The typical workflow of the counselling operation is illustrated in figure 5.2 below:

Figure 5.2 The workflow of the advisory function



Source: DAMVAD 2015

As shown, a keystone function in the advisory service is the systematic reception of inventors through the online reception tool. This initial contact with inventors and the task of referring them to the reception tool is in the hands of a “gate keeper”.

Once the idea has been described, an advisor is assigned to provide initial counselling of the inventor. If needed, this goes on to extended counselling, if the idea is sufficiently promising. The shift from initial to extended counselling has become more fluid since 2013, when an advisory board made this decision. Today, the IAS qualifies ideas for extended counselling itself. Extended counselling is considered initiated when an idea has been described through the 10 steps and is assigned a dedicated advisor to work on commercialisation of the idea (see section on extended counselling in Chapter 4).

5.5 Resources and budget

The IAS has an annual budget of DKK 8.5 million. Of this, DKK 1 million is dedicated to the Education Service function, described in the previous chapter.

Nearly the entire budget is dedicated to wages and overhead. Annually, the organisation employs slightly more than 10,500 man-hours.²²

Initial vs. extended counselling: The IAS estimates the division of time between initial and extended counselling to be 75 and 25 pct., respectively.

²² IAS (2012b) and IAS (2013).

6. Part of the commercialisation support chain

In this chapter, we examine the role of the Inventor Advisory Service among other service providers in the national commercialisation support chain.²³

6.1 The commercialisation support chain

The commercialisation system consists of a relatively large number of scheme operators with different and overlapping targets groups, instruments, and goals. These are operated in parallel at national, regional and municipal administrative levels. In a nation-wide perspective, the IAS is part of a national commercialisation support chain.

An overview of the public operators along the commercialisation chain is shown in figure 6.1 below. Operators are placed according to which parts of the commercialisation chain they support. Here, we make the distinction between three (somewhat overlapping) parts of the commercialisation chain:

- **Idea making:** Schemes directed at idea makers to promote the making of more ideas
- **Idea development:** Schemes directed at developing ideas, once proposed.
- **Idea commercialisation:** Schemes directed at bringing developed ideas to market, once developed.

The later stage of market maturity lies beyond the scope of this evaluation, but is included to illustrate operators beyond the IAS.

6.2 The role of the Inventor Advisory Service

As described in Chapter 4, and as shown above, the IAS is active across all these parts of the commercialisation chain. The Education Service is directed at idea makers (students), while the advisory functions are aimed at idea development and commercialisation.

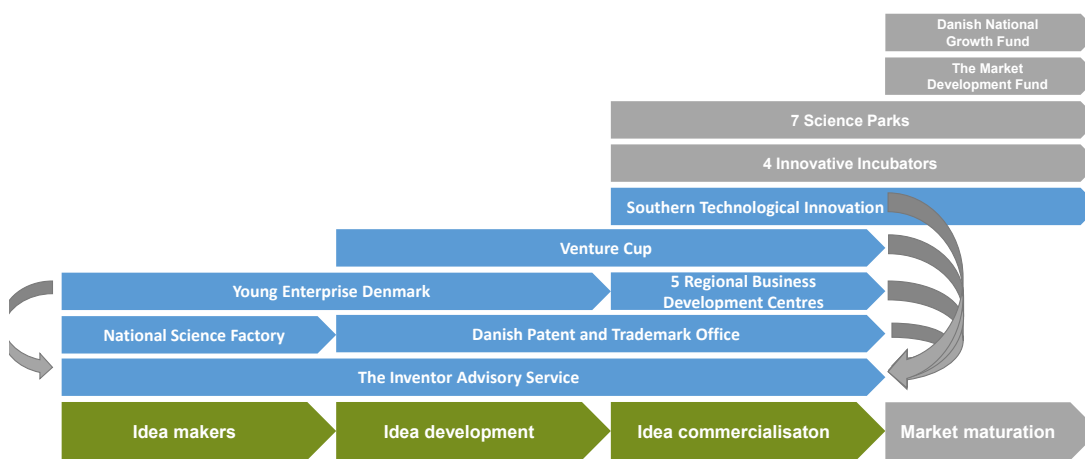
²³ By "commercialisation chain", we mean the process from idea making to first sale.

As shown, the IAS is only one among many scheme operators. However, three features distinguish the IAS, in that it focuses on:

- **Private individuals** (not e.g. businesses or research institutions)
- **Advisory services** (not e.g. funding or networking)
- **Licensing** as primary commercialisation pathway (not e.g. starting a new business).

The IAS is the only organisation in the national commercialisation support system that specifically targets private individual inventors.

Figure 6.1 Public operators along the commercialisation chain



Source: DAMVAD 2015

Note: Operators outlined with blue arrows have been interviewed for this evaluation. Grey arrows indicate cooperative ties.

6.3 Other idea maker schemes

At the national level, there are a large number of educational services focused on a variety of topics and age groups. Not all of these have been included in figure 6.1. The education services closest to the topics covered by the IAS are the Young Enterprise Denmark and Science Factory.

All three educational services are working to promote idea making among students, but from different angles.

The Young Enterprise Denmark focuses on promoting Entrepreneurship (new businesses), while Science Factory focuses on science skills and empirical thinking. The Education Service of the IAS focuses on idea creation, idea validation and invention.

According to Science Factory, there is no cooperation between them and the Education Service. However, the IAS is active as jury members and judge and is represented annually at the Young Scientists' Conference hosted by Science Factory.

According to Young Enterprise Denmark they collaborate with the Education Service but not directly about educational services. Their cooperation is focused in the advisory part of the IAS. The IAS disagrees with this assessment: The IAS hosts groups from Young Enterprise Denmark, including prototype workshops.

6.4 Other idea development schemes

As shown in figure 6.1 several operators of public schemes are active in the idea development phase.

Like the IAS, Young Enterprise Denmark is actively developing ideas, especially among the older students. Venture Cup too works to develop ideas from university students. The Danish Patent and Trademark Office is included in this part of the commercialisation chain, but serves a very different purpose than the other two. The Danish Patent and Trademark Office is, however an important part of the idea development phase, especially in clarifying the originality of the idea and protecting ideas from imitation.

In this part of the commercialisation chain, the IAS both overlaps and differs from Young Enterprise Denmark and Venture Cup in terms of target groups. The IAS actively promotes student inventors; however, its target group includes all individual inventors. In addition, the service provided – advice with the aim of selling a license – is unique among the operators here.

Young Enterprise Denmark is positive about its dialogue with the IAS. The IAS is present at the Danish Entrepreneurship Award, where they have their own ‘area’ in the ‘advice zone’. Apart from that, the IAS provides tools and tips to coming entrepreneurs by delivering some of the most read posts on Young Enterprise Denmark’s blog <http://youngtrepreneur.dk/> as well as delivering relevant presentations on the main stages at the Danish Entrepreneurship Award.²⁴

According to Venture Cup there is currently no collaboration between the IAS and Venture Cup. Venture Cup has never directed someone to the IAS or experienced it the other way around. In the future, Venture Cup hopes there will be a stronger connection between the two organisations. In order to make this collaboration work, Venture Cup recommends a structural and agreed collaboration. Today, Venture Cup finds the landscape of commercialisation too divided and sees a great potential for the inventor mind-set and the start-up mind-set to work together.

The Danish Patent and Trademark Office expressed that it has a very well-functioning collaboration with the IAS. By that, it means it is well aware of the schemes’ respective purposes and competences, and uses that to help inventors etc. Specifically, The Danish Patent and Trademark Office plays an important role in testing opportunities for legal protection of inventors’ ideas through their patent searches.

6.5 Other idea commercialisation schemes

As shown in figure 6.1, a large number of schemes are active in this phase of the commercialisation chain. We will not go through all of them. However, their target groups are primarily entrepreneurs and established businesses. Consequently, the commercialisation pathways promoted by these schemes are introducing innovations through new businesses or through product development in existing businesses.

²⁴ see: <http://www.ffe-ye.dk/> and <http://youngtrepreneur.dk/2014/10/23/gaesteblogger-kasper-birkeholm-munk-fra-teknologisk-institut/>

The IAS focuses on licenses and exclusively supports private individuals. Among the commercialisation schemes shown, this is a unique service, which is also highlighted among some of the interviewed.

The Regional Business Development Centre refers to the IAS if it has customers with inventions but otherwise it has no organised cooperation and hence expressed that there is room for more collaborations.

Southern Technological Innovation expressed that it have a well-functioning collaboration with the IAS. By that, it means that it each scheme is well aware of the other's purpose and competences and uses that to help inventors etc. Southern Technological Innovation highlights that it benefits a lot from the short physical distance between itself and the IAS, which according to Southern Technological Innovation makes the collaboration more flexible.

Both Southern Technological Innovation and The Danish Patent and Trademark Office emphasise that it is in the early stages of idea development that the IAS makes the most significant difference because their idea generation support is unique. Specifically, it provides a sorting mechanism for citizen ideas and qualifies inventors as well as realises the best ideas.

6.6 Coherence and cooperation

In considering coherence and cooperation among schemes along the commercialisation chain, we take departure in two premises:

- From the viewpoint of idea makers, it is not important who provides services, as long as the idea has the best possible chance at commercialisation.
- From the viewpoint of society, it is not important how an idea is commercialised, as long as the best ideas are successfully commercialised.

A coherent idea commercialisation support chain could therefore be characterised by either “no wrong door” or “one stop shop”. In Denmark, both are made difficult by the large number of independent schemes with partially overlapping target groups, instruments and aims.²⁵ In addition, the commercialisation chain is divided between at least two national ministries as well as regional and municipal operators. Effectively, there is no “one stop shop”: a single contact point from which services are provided.

The “no wrong door” approach involves every scheme being able to refer idea makers to (in principle) every other scheme. A recent analysis by DAMVAD for DASTI showed that, while some mutual referrals exist, the commercialisation support chain has not achieved a “no wrong door”-function.²⁶

As we have seen, the IAS is part of a system of incoming and outgoing referrals. These are not all systemised, but rely partly on personal relationships. Adjacent scheme providers interviewed for this evaluation are generally aware and actively refer inventors to the IAS.

²⁵ See DASTI (2014b)

²⁶ DASTI (2014b)

7. Conclusions and recommendations

In this chapter, we draw conclusions from the previous chapters, and make recommendations for the further development of the Inventor Advisory Service.

7.1 The evaluation concludes...

The evaluation finds that the IAS is:

Well-suited to its purpose with a good alignment of what the IAS is to achieve and what it does. As described in Chapter 4, licensing is a direct and cost-effective commercialisation pathway for private inventors with limited business experience. This pathway exploits existing production and marketing capacity already present in the economy, and thus provides a good alternative to e.g. entrepreneurship. In addition, as detailed in Chapter 4, the IAS is competent and well suited to its task and represents a relatively simple and direct means to a clear end: the commercialisation of ideas of private individuals.

Achieves its formal goals, as described in Chapter 4 the purpose of the IAS is operationalised in a number of formal milestone goals directed at services rendered, successful commercialisation, communication and visibility and educational services. The IAS achieves its formal goals and surpasses several of them.

Preliminarily, a sound public investment, but this cannot be empirically shown without an economic impact assessment. The IAS investigated the value of the 16 most lucrative license agreements it counselled during the period 2000-2009.²⁷ These generated an annual average turnover of DKK 276 million during the 10-year period investigated. Given the size of the annual public investment in IAS, a decisive role in realising just one of these agreements or a minor role in realising several of them is likely to have created value in excess of the investment made in the IAS. However, as will be described in Chapter 8, turnover cannot without reservations be considered economic impact. In addition, important cost-side considerations must likewise be taken into account. Last but not least is the question of whether this value would have been created without intervention from the IAS. To address these questions, we propose an economic impact assessment model in the next chapter.

A small and nimble organisation, as described in Chapter 5, the IAS is a small, nimble and flat organisation. As shown in Chapter 4, the majority of its resources are allocated to initial counselling of inventors. The organisation is sensitive to turnover of key personnel, which is

²⁷ IAS (2012a)

immediately relevant in light of the imminent retirement of two of its most experienced employees.

Part of a fragmented commercialisation support chain. As described in Chapter 6, the IAS is one among many schemes along the commercialisation chain. The organisation is part of an informal system of references to and from adjacent support schemes. These are not formal or systematic and rely on personal relations. Overall, the organisation cannot be said to be part of a “no wrong door” commercialisation support chain.

7.2 Three avenues of development

The recommendations are directed at three avenues of development we see for the IAS, explained in the following:

More ideas into the funnel: One simple avenue of development is to increase the volume of ideas that reach the IAS. This presupposes a non-declining marginal rate of success of more ideas. The most experienced advisors of the IAS support this presumption. In their experience, the current success rate of ideas has remained roughly stable throughout the 43-year history of the organisation (it is currently around 1:235). In addition, this is supported by the literature on idea success rates.²⁸ Following this rationale, increasing the input of ideas to the IAS should in principle increase the number of licenses (at least) proportionally. Note that using the data collected as part of the economic impact assessment, it may be possible to empirically test this assumption.

Increasing the idea success rate: A second avenue of development is increasing the success rate of the ideas received by the IAS. While experience and the literature speak for a very robust success rate of ideas (see previous), the benefits of increasing the success rate may be substantial.²⁹ In effect, there may be segments of inventors with a higher than average quality of ideas. Increasing the proportion of these in the target group of the IAS may increase the success rate. Another way to influence the idea success rate is for the IAS to be more selective (demand more from inventors) before providing initial counselling.

Maximum impact, given limited resources: As a third avenue of development, we raise the question of the prioritisation of limited resources between the three major functions of the IAS:

4. Educate potential inventors
5. Provide public service to inventors
6. Commercialise the most promising ideas

Currently, the resource allocation is approximately 12, 66, and 22 pct.³⁰ respectively. Could more be achieved with the same budget or could an additional investment yield a disproportionate pay-off?

²⁸ See e.g. Stevens et al (1997) and Babcock (1996)

²⁹ Note, that although the success-rate (initial counselling to licensing) appears larger in later years in table 4.1, the high number of licenses is the result of ideas received in previous years.

³⁰ Based on the DKK 8.5 million budget, of which 1 million is allocated to the Education Service, while the division between initial and extended counselling is 25 pct. 75 pct., respectively. See Chapter 4.

With this in mind, we turn to the recommendations of the evaluation.

7.3 The evaluation recommends...

The recommendations of the evaluation are developed after talking to people in and around the IAS. The recommendations are, however, fully the responsibility of the evaluation team, and no one else.

The common theme of our recommendations for further developing the IAS is that of moving resources “downstream” in the value chain – from educating potential inventors, towards commercialising the most promising inventions.

A more focused Education Service: The Education Service is to promote licensing as an alternative to entrepreneurship as a pathway for realising ideas. Important as this may be, the target group of the Education Service is disproportionately large. The Education Service currently has a target group of 1.25 million students in Denmark³¹ in addition to teachers and educators at all educational levels. Services are provided on a “first come, first served” basis until the DKK 1 million budget is spent. In this light, we believe that the intervention is out of proportion to its target group. Therefore, we recommend, that one of three courses of action be considered:

- **Focus the Education Service** on the target groups where it makes the most difference to the advisory function of the IAS, e.g. engineering students, technical students, artisan educations, industrial designers, etc. In this role, the purpose of the Education Service will be that of prompting potential inventors to submit their ideas into the advisory function of the IAS.
- **Coordinate the Education service** with other educational services and pool resources to present licensing as an alternative commercialisation pathway nationwide.³² In this role, the current rationale can be sustained, more or less as it is. However the current independent organisation of the Education Service should be reconsidered.
- **Train the trainers** and focus the Education Service more on teachers and, through them, students. This would be a way to achieve leverage with the limited resources of the service, considering the comparatively large target group.

Update the online reception tool: As described in Chapter 4, the initial phase of counselling is the most resource demanding part of the operation of the IAS. Even a small improvement here will free up significant resources for other functions. The IAS has already taken a number of initiatives to bring this share down. Among these are:

- Introduction of a “gatekeeper”-role, as described in chapter 5
- Development of the inventor’s 10 steps online reception tool, to aid first contact with inventors (introduced in 2009).
- Increasing demands for more pre-work from inventors before providing counselling (introduced 2013-2014).

In light of this, we recommend an update of the online reception tool with the specific aim of freeing up resources for use elsewhere (see next recommendation). Here, it should be considered

³¹ Statistics Denmark (2014)

³² See an example here: <http://Skoletjenestenetvaerk.dk/>

if the IAS could share a joint portal with other actors in the commercialisation system. An example is the portal developed by the Danish Patent and Trademark Office and Youth Enterprise Denmark. As described in Chapter 6, the former is currently a close partner of the IAS. See the portal here (<http://www.styrkdinide.dk/>).

Prioritise the commercialisation phase: From a socioeconomic viewpoint, commercialisation of the most promising inventions through licensing is the key function of the IAS. The successful commercialisation of only a few extra licenses each year would be a large proportional increase in the value added by the IAS. Therefore, we recommend, that additional resources be focused here. Several possibilities present themselves:

- **An expanded IPR-service:** For some businesses, the IPR-question is an important barrier to entering into a license agreement with an inventor. Currently, the IAS refers inventors to the Danish Patent and Trademark Office, which for a minor fee paid by the inventor, conducts a patent search, guided by the inventor. The result of this search is not a definitive answer to whether the invention is truly novel or already in existence. Rather, the search yields a stack of related patents, which the inventor must then go through and assess himself. The IAS has noticed, firstly, that there is significant bias when inventors assess the novelty of their own invention. Secondly, according to IAS-advisors the businesses are not always inclined to accept the mere judgment of the inventor. Here, an expanded IPR-service, yielding definitive answers, offered to selected inventors could clear the way for a license agreement.
- **Expert assessment of technical feasibility:** When assessing technical feasibility of complicated inventions, there is a significant information asymmetry between the inventor and prospective license-holding businesses. For some inventions, obtaining an independent expert assessment (in paper and signed) of technical feasibility can significantly reduce this barrier.

Outreach to new segments: A broad segment of inventors is already in contact with the IAS. In addition, the organisation has already prioritised significant resources and manpower to communication, outreach and community management as described in Chapters 4 and 5. Nevertheless, we recommend that the IAS considers reaching out to the most promising segments of its target group. Firstly to increase the number of ideas on its input side, and secondly to increase the overall success rate of ideas. In line with our earlier recommendation for a more focused Education Service (see above), some possibilities are technical students, certain crafts, industrial designers, technical university students, architects and others.³³ Beyond the ones we can mention here, we recommend that the IAS considers this question further, using its extensive experience. Who are the promising inventors, whom are not currently clients of the organisation?

7.4 Revising the result contract

Overall, we think that the milestones are relevant to the IAS and strike a good balance between being relevant to the overall rationale of the organisation and being realistically controllable. The recommendations proposed here will however have consequences on the official milestones.

³³ Idea development among this group is normally addressed by the technology transfer organisations at the universities. But these are typically specialised in commercialising R&D. Here, the IAS could be a valuable commercialisation pathway for ideas not suited to this model.

Proposed revisions to milestones are included in box 10 below. Here, we will discuss possible changes under four headings:

- **Commercialisation goals:** The recommendations we make here can probably be implemented within the current milestone framework. However, the balance between extended counselling (milestone 1) and initial counselling (milestone 2) will shift considerably.
- **Communication goals:** The communication goals largely remain as they are. A possible clarification is that we see the communication efforts of the organisation as a means to reaching new user groups.
- **New users:** This milestone would need to be clarified in light our recommendation that a more systematic search for new and well-suited target groups. Its current formulation seems to signify that the organisation is to diversity from serial inventors.
- **The Education Service:** As described above, the need to revise the milestones of the Education Service will depend largely on which of the three options outlined under “Focus the Education service” is considered. The current milestones and possible changes for each of the three models are shown in box 11 below.

BOX 10: POSSIBLE CHANGES TO MILESTONES FOR THE ADVISORY FUNCTION

- Extended counselling on 40 inventions, leading to commercialisation of 23 of inventions, either through licensing or other means of commercialisation.
- All requests on initial counselling (about 3.000 through the period) will be handled professionally and ~~to a uniform standard, albeit~~ with flexibility and inventors are expected to sufficiently qualify their idea and submit it through the online format.
- Strong communication of the services offered by the Inventor Advisory Service and its results, including visible presence on relevant social media platforms. **In particular, outreach to new promising target groups among inventors should be prioritised.**
- Ensure that a significant proportion of inventions origin from new users. **In particular, new promising target groups are to be included among its users.**

BOX 11: POSSIBLE CHANGES TO MILESTONES FOR THE EDUCATION SERVICE

Milestones for the current Education Service:

- 1.500 students have received a tailor made educational service
- 50 advisory services to students via email
- 100 advisory sessions with students via chat

Milestones for a focused Education Service:

- **1.000 students in fields related to product development (e.g. engineering students, technical students, artisan educations, industrial designers, etc.) have received a tailor-made educational service.**
 - **200 participating students have submitted ideas to the advisory function of the**
-

Inventor Advisory Service.

- 1 student has obtained a license or otherwise commercialised an idea after contact with the advisory function.

Milestones for a coordinated Education Service:

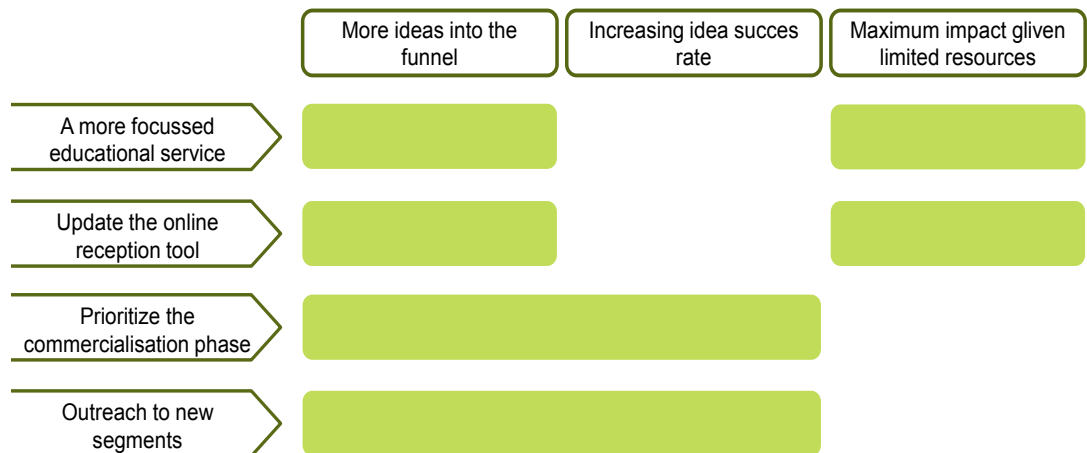
- 1.500 students have received a tailor-made educational service directed at idea realisation through invention and licensing
- 1.000 of these through events shared with other relevant educational services, e.g. entrepreneurship and young researchers.
- 50 advisory services to students via email
- 100 advisory sessions with students via chat

Milestones for an Education Service teaching the teachers:

- 500 educators have received tailor-made support directed for promoting idea realisation through invention and licensing among their students.
 - 50 advisory services to students via email
 - 100 advisory sessions with students via chat
-

The recommendations and their rationale are summarised in figure 7.1 below:

Figur 7.1 Summary of recommendations



Source: DAMVAD 2015

Budget consequences: The recommendations made here will influence the budget for the IAS in coming years. Some recommendations can potentially save resources for other uses, e.g. coordinating the Education Service or revising the “public service” milestone. This could make investments into e.g. updating the online reception tool or extended commercialisation services possible within the existing overall budget. However, maintaining the existing service level, while implementing cost-intensive recommendations will require additional resources. Therefore, whether the recommendations made in this evaluation can be implemented within the existing budget or if additional funds are needed, depends on the combination chosen.

8. Measuring the impact of the Inventor Advisory Service

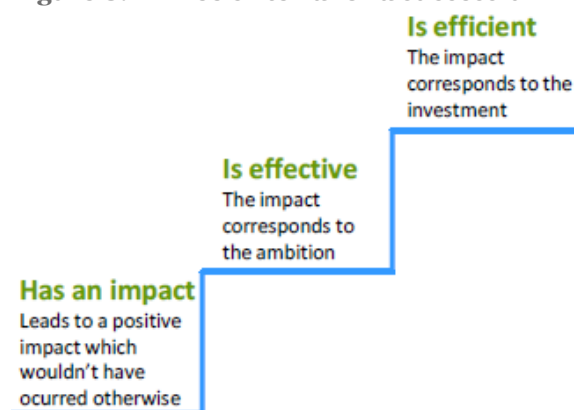
In this final chapter of the evaluation, we develop an impact measurement model suited to the Inventor Advisory Service. In addition, the key concepts and considerations included here have equal relevance to similar public interventions into the commercialisation system.

8.1 The meaning of impact

From the viewpoint of socioeconomics, the IAS should generate a return in excess of its cost. The value created by the IAS should exceed the DKK 7.5 million used for counselling. With this in mind, we propose the following research question for an economic impact assessment of the IAS: Does the Inventor Advisory Service create additional value to society in excess of its cost?

Therefore, we propose an impact assessment focused on efficiency, as shown below:

Figure 8.1 Three criteria for a successful investment



Source: DAMVAD 2015

Efficiency: The impact assessment model we propose here focuses on *efficiency*. In this light, it is not sufficient to consider whether the organisation has impact. Injecting DKK 7.5 million into the economy anywhere is likely to fulfil that criterion. Any impact must be seen in light of what it costs to create it. In other words, it may be possible to purchase impact too dearly, effectively creating a larger negative impact elsewhere. For this reason, we propose a model where the impact of the IAS is seen in light of its cost.

Additionality: Another important aspect of impact is the concept of *additionality*. In other words, the impact that would not have happened without the IAS. With regard to the IAS, the impact model proposed here takes into account two kinds of additionality:

- **For inventors:** Would the invention have been commercialised without intervention from the IAS?
- **For businesses:** Would the license-holding business have developed another invention of equal value without intervention from the IAS?

Given these two types of additionality, the impact model we propose here attempts to subtract the value of what would have happened otherwise. Thus, we assign only the value actually created by the IAS to its credit.

Earnings as measure of value: The impact assessment previous done by the IAS used turnover generated by the licenses as its measure of impact.³⁴ As an alternative, we propose using profits (which is turnover minus costs). To illustrate why, consider a business licensing an invention, producing it and selling it in large quantities. However, the costs of adapting its production line are larger than the turnover from the invention. In this case, the business would have been better off not adopting the invention after all. In spite of this, an impact assessment would show a significant increase in turnover. For this reason, the impact model we propose here uses earnings as a measure of impact.

Distortion of the economy: The true cost of a publicly funded intervention includes costs of the negative impact of increased taxation on other parts of the economy (also called the distortion effect). The Ministry of Finances has created guidelines for how to calculate the socioeconomic impact of a public intervention.³⁵ The guidelines set the tax distortion loss to 20 percent. The true cost of a public expenditure of 100 million DKK is thus 120 million DKK when accounting for the tax distortion.

Some cost-side omissions: The impact proposed here will give a good indication of the value of the IAS. However, for practical reasons, we make two important omissions:

- **Earlier administrative costs:** In addition, the total cost of the IAS includes administration earlier in the chain from collection to distribution of tax revenue to the IAS. This cost is not included in the model proposed here.
- **Opportunity cost:** In addition, the resources invested in the IAS could have been allocated to an alternative intervention. Therefore, the value created by the IAS should, in principle, be compared to the opportunity forgone by investing it here. The model we propose does not make such a comparison.

Easy data collection: Impact assessment should impose the smallest possible burden on sources of data. Therefore, the impact assessment model proposed here will, to the widest possible extent, rest on data already collected. Where this is not possible, we limit data collection to 1-2 simple questions (1 minute response time), directed at inventors and license-holding businesses. This data will be collected for the first time through the impact study and can subsequently be collected routinely as part of the existing contact between the IAS and its users. This part should be considered when designing an improved online reception tool, as proposed

³⁴ IAS (2012a)

³⁵ Finansministeriet 1999 "Vejledning i udarbejdelse af samfundsøkonomiske konsekvensvurderinger"

in the previous chapter. We consider this a reasonable burden asked of beneficiaries of an essentially free service paid by public money.

Other uses: The data collected for impact assessment can be used for a lot more than determining economic impact. Such questions as “Does some types of inventors have a higher success rate than others?”, “Are some types of inventions more successful than others?”, “How does the inventor population change over time?” and so forth. The data collected here should thus be put to a broader and strategic use to develop the IAS itself.

8.2 A proposed methodology

On this basis, the impact assessment model proposed here seeks to establish three figures for every licensed invention:

- *The additionality of counselling* for the successful licensing of the invention.
- *The additionality of the invention* for the license-holding business.
- *The earnings from the licensed inventions* realised by the license-holding business.

The additionality of counselling (Ac). Establishing the additionality of the counselling essentially amounts to establishing if the inventor would have commercialised without help from the IAS. The key source of this information must be the inventors themselves. Consequently, this must be a subjective assessment. We therefore propose a survey-design, centred on a single counterfactual question posed to inventors having sold a license over the last few years: “Would you have commercialised your invention without advice from the Inventor Advisory Service?”. Here, we establish a multiple-choice answer corresponding to an additionality factor between 1 and 0. Here, 0 would represent the situation where the inventor is absolutely sure that the invention would not have been commercialised otherwise, and conversely for a factor of 1. While such an assessment must necessarily be uncertain, the law of large numbers dictates that the more inventors answer the question, the more accurate the aggregate will be.³⁶ While the initial additionality factor must be established through the impact assessment, we propose that the IAS routinely query successful inventors about the additionality of the counselling, moving forward.

The additionality of the invention. Here, we seek to establish the additionality of the invention to the license-holding business. This amounts to establishing whether the business would likely have developed an alternative invention as valuable as the one now licensed. As for the additionality of counselling, the license-holding businesses must be the source of this information. Here, we use the same questioning technique sketched out previously. We ask “would your business have developed an equally valuable invention?” In addition to this question, we pose one more question to the license-holding businesses, described next.

The earnings from the licensed inventions (A₁). The earnings from a new invention are derived from two elements: turnover from its sale minus the cost of its development. Drawing on the experience of the last impact assessment made by the IAS, we can ask businesses about turnover from the invention. In our experience, however, asking businesses about their earnings or costs is much more competitively sensitive information. Businesses themselves will therefore be unlikely to provide us with this figure, even under guaranteed anonymity. Therefore, we propose establishing the cost, using the general operating margin through financial reports of

³⁶ The law of large numbers will, of course, not correct for systematic bias, say, if inventors systematically underestimate the contribution from the IAS.

the businesses involved. These are publically available through the public business registry (CVR in Denmark) and their equivalents in other countries. In using operating margins, we assume that the business will be no more efficient at making money from a new product than from its existing products. In reality, some will be worse, while others will be better. Therefore, the law of large numbers applies here as before. In essence, the figure becomes better as more businesses are included in the study.

With these three figures established, we can make an impact assessment model of the IAS.

8.3 Is the Inventor Advisory Service a good investment?

By applying the proposed methodology, it is possible to calculate the impact of the IAS and compare it to its cost. Essentially, the societal return of IAS is positive if the additionality of the service is greater than its cost including the implied tax distortion. This is the case if the equation below is greater than zero:

$$OM * R * A_C * A_I - C * 1.2 > 0$$

$$\text{Where: } 1 \geq A_C, A_I \geq 0$$

Where OM is operating margin, R revenue from the license, and A_C and A_I the additionality of counselling and the invention, respectively. C is the cost of the IAS, excl. the Education Service and finally, 1.2 is the tax distortion factor.

Appendix 1: Methodology

The evaluation rests on four analytical elements, summarised in this appendix:

Desk research. The evaluation rests on all available written documents and statistics on the Inventor Advisory Service. These are summarised in the bibliography in the next section, and referred to throughout the report.

Site visit. As part of the evaluation, we have visited the Inventor Advisory Service, talked through its processes and interviewed its director and its advisors.

Interviews with inventors and businesses. For the evaluation, we have interviewed four groups of users. All interviews were conducted by telephone on the basis of a semi-structured interview guide. As several inventors asked us about secrecy and one required us to sign a non-disclosure agreement, we have chosen not to disclose the identities of the users interviewed in this report. The following groups were interviewed and the number interviewed is indicated in brackets:

1. Inventors currently receiving counselling (5)
2. Inventors who have successfully sold a license (5)
3. Inventors who have abandoned their idea after counselling by the Inventor Advisory Service (5)
4. Businesses holding one or more licenses purchased from inventors after counselling by the Inventor Advisory Service. (5).

Users of the Education Service. Specifically among users of the Education Service, we have interviewed the following:

- Arken/Cph West, Museum Communicator Gunnar Munksgaard
- Tradium Handelsgym og Teknisk Gymnasium Randers, Teacher Pia Bomholt
- Trefalkeskolen, Teacher Carl Pallesen
- Erhvervs Akademi Sjælland, Campus Roskilde, Teacher Susanne Korsholm
- Fonden for Entreprenørskab, Projekt Manager Sine Larsen

Other actors in the commercialisation support chain. As part of the evaluation, we have interviewed other actors in the publically funded commercialisation support chain. We have interviewed the following:

- Patent og Varemærkestyrelsen, Key Account Manager Helena Larsen
- Fonden for Entreprenørskab, Projekt Manager Sine Larsen
- Syddansk Teknologisk Innovation, Investment Manager Søren Georg Jensen
- Venture Cup, CEO Human Sjøhae

- Væksthus Sjælland, Growth Consultant and IP coach Ingemarie Søndergaard
- Teknologisk Institut, Direktør for erhvervsudvikling og virksomhedsudvikling, Jane Wickmann

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