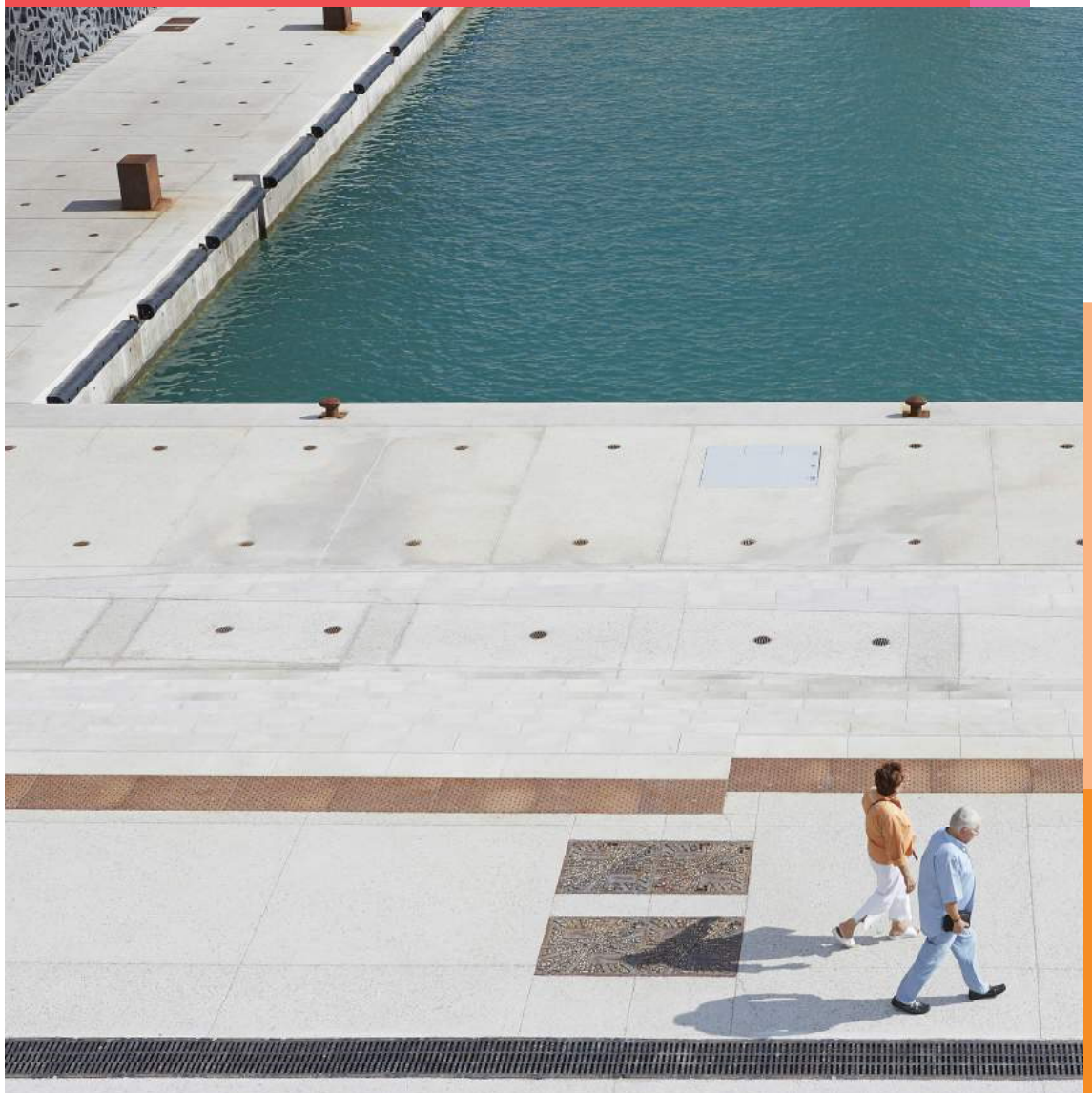


Public Private Partnerships & Idea selection

A tool to select technological healthcare
innovation ideas



*‘PPPs should select technical
healthcare innovation ideas
by answering seven questions’*

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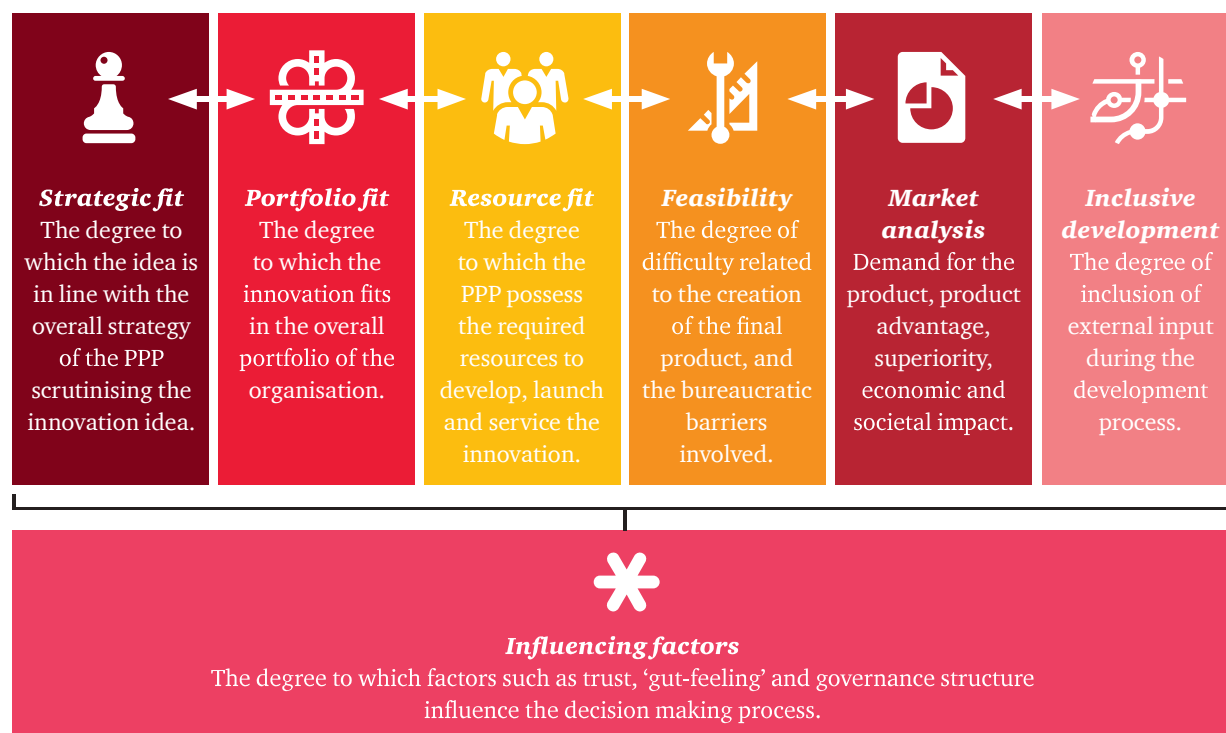
Executive summary

Innovation in healthcare so far has tremendously contributed to longevity and quality of life of people. One of the consequences is an ageing population with substantial medical needs that puts financial pressure on existing healthcare systems. Technological healthcare innovations can aid in containing this rising expenditure. However, the development of these innovations is expensive, risky, and subject to regulatory barriers. As a response, Public Private Partnerships (PPP) emerge which gather, share and allocate resources more efficiently.

In their efforts to create the innovations needed at a sustainable cost, while mitigating development related risks, we have noticed that PPPs struggle in identifying and selecting the innovation ideas with the highest

success potential. The fundamental difference in the way private organisations and PPPs are structured make existing tools designed for guiding such a selection process inapplicable. In other words, PPPs are 'left in the dark' when it comes to selecting promising innovation ideas.

As a solution, we have developed a new tool to offer guidance to PPPs currently facing challenges during the selection of technological healthcare innovation ideas. The following insights are distilled from a larger study conducted by the Innovation & Development group of PwC NL. The tool presented in this publication aims to offer a holistic approach during the selection process by highlighting the most important criteria to be taken into account, namely:



Section 1: Increasing healthcare expenditure drives the establishment of PPPs

The increasing healthcare expenditure is not sustainable

During the last 50 to 60 years, most developed countries have gained about 20 additional years of life expectancy at birth. This means that one in every five people in developed countries is older than 60 and, on average, they will live to reach the age 80. Increasing longevity of life is certainly a positive development in terms of human capital and quality of life, but it puts an enormous financial pressure on healthcare systems. Looking at the OECD countries, we see clear increases in the percentage of total GDP that is spent on healthcare. For instance, total Dutch healthcare expenditure was 7%, and 11,4% of the total GDP in 2000 and 2013 respectively. These figures were 12,5% and 16,4% of the total GDP in the United States in the same years. The conclusion is that this rise in healthcare expenditure cannot be sustained in the long run.

Although systemic reforms are definitely needed to curb the increasing healthcare expenditure, much can already be achieved through the introduction of technological healthcare innovations. Innovations such as wearables and home monitors that allow medical specialists to track the health of their patients can lead to significant reduction in terms of costs spent on regular check-up visits. More intricate innovations that can assist surgeons to perform operations faster, more safely and in a less invasive manner (allowing faster recovery of patients) can also yield significant cost reductions. Finally, developments in personalised medicine, augmented transplantation, robotics, automation, and genetic manipulation are expected to revolutionise human lives and reduce healthcare costs in the coming decades.

The paradox however, is that next to the development, testing, and validation of the above-mentioned innovations, their implementation and maintenance is also cost intensive. In the U.S., where the share of the gross domestic product spent on healthcare is the highest in the world, it was estimated that 40-50% of the total cost rise was due to new or increased use of medical technology.

Public Private Partnerships enable efficient development of cost saving innovations

Intensive collaboration between stakeholders is required to reduce costs in developing technological healthcare solutions. To this end, Public Private Partnerships (PPP) are emerging. These PPPs are defined as co-operation between public and private sectors with a durable character in which actors (e.g. municipalities, private organisations, universities) develop mutual products and/or services and in which risk, costs and benefits are shared.

When designed properly, collaboration in a PPP can offer benefits to every participating stakeholder. Participation can induce cost reductions through shared use of facilities and logistical infrastructure and provide access to a broad knowledge and expertise base. Participants share risks through distribution of costs and ensure faster uptake of innovations through early interaction with (launching) customers. Additionally, PPP participation can help to decrease regulatory barriers related to product development and launch when governmental partners are included in the partnership.

Several participation benefits are exclusively relevant for certain group(s) of stakeholders. For instance, universities can benefit from extra budget and access to state of the art laboratories to perform research, and allowing PhD students to work closer to the market. Private organisations can benefit from close collaboration with renown and highly talented academics. Governmental stakeholders can benefit by sharing the (financial) risks involved in the realisation of large infrastructural projects (e.g. building of a new hospital) by entering in multiyear contracts with private parties. Just to name a few.

Section 2: PPPs face challenges in selecting promising healthcare innovations

PPPs lack adequate tools to structure the early phase of the innovation process

In a similar way to private organisations developing innovations, PPPs have to go through a product development cycle. In these cycles, decisions are required as to which of the innovation ideas will be developed into products. Common barriers within this decision process include long development times, uncertainty of market data used to develop the business model of the innovation, and uncertainties of surrounding the technology driving the innovation.

To decrease these barriers, a myriad of tools exist to structure the idea screening stage and make ‘go/no go’ decisions (e.g. Coopers new product method, Idea Scoring Methods, Analytic Hierarchy process, benefit measurements models, portfolio selection methods, economic selection models, research approaches using focus groups and panels). However, these tools are designed for private organisations and are less effective in PPPs because of fundamental differences between

PPPs and private organisations. PPPs, for instance, need to ensure that the innovation idea selected answers and matches the divergent agendas, needs, motivations and expectations of the various PPP stakeholders. Furthermore, the selection of the innovation ideas has to be conducted between several partners in a horizontal governance structure rather than the more hierarchical structure present in private organisations. Finally, questions with regard to distribution of IP ownership, royalties and revenues further call into question whether these tools can be used by PPPs.

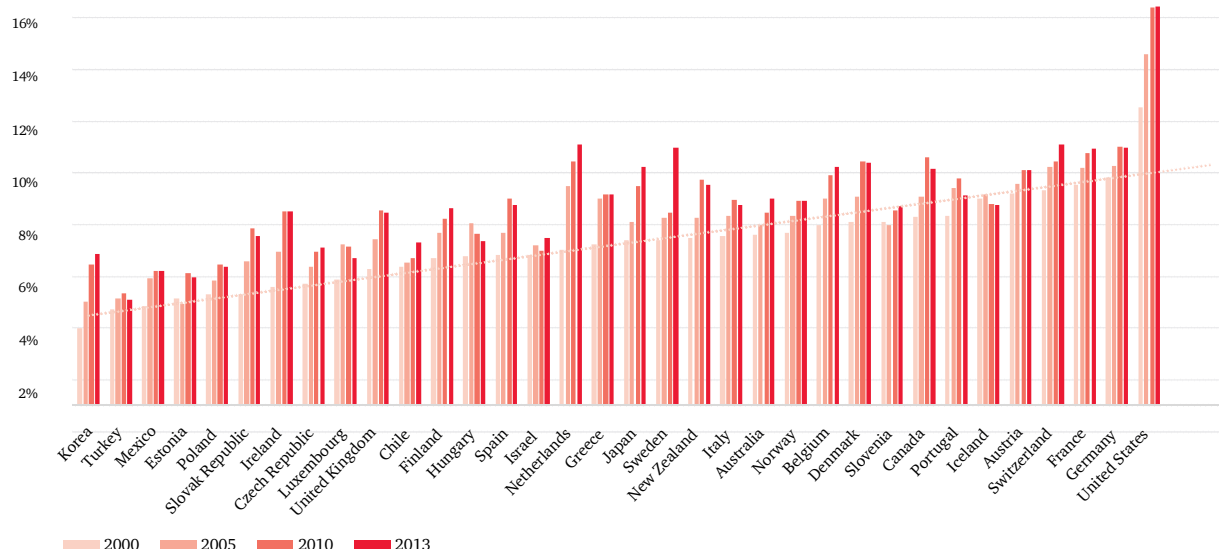
PwC offers a new tool specifically designed for PPPs to select technological healthcare innovation ideas

It is essential to address the specific requirements of PPPs if they are to decrease the cost of innovation and play a role in reducing healthcare expenditure. With this in mind, we have developed an idea selection tool based on proven conceptual frameworks and tools, customised to be used by PPPs.

A conceptual framework was developed based on an extensive literature review. We challenged this framework through twenty in-depth interviews with representatives of top pharma and life science companies, academic experts from universities, and representatives of PPPs operating in Europe. A specific case study in the region of Amsterdam was included to validate our interpretation of the results through two focus group discussions. Through this publication, we aim to offer solutions to challenges faced by PPPs that we assist on a daily basis, and to others struggling with this knowledge gap in the topic of innovation creation.



Figure 1. Total healthcare expenditure OECD countries (%GDP)

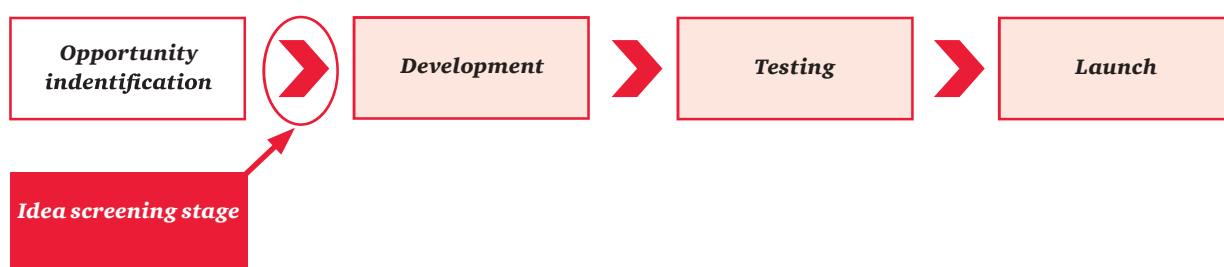


Source: stats.oecd.org (latest figures at the time of writing this publication)

PPP increase

The increase of PPPs is according to the European PPP Expertise Centre (EPEC) apparent when considering that the value of investment by PPPs in the European Union reached a total of 18.7 billion euros in 2014. This is an increase of 15% in comparison to the total of 16.3 billion in 2013. EPEC also identified that the average transaction size increased from 203 million euros in 2013 to 229 million euros in 2014. Two thirds of the PPP investments (11.8 billion euros) were in the development of infrastructure projects (e.g. Motorways, bridges, subways), followed by investment in the healthcare sector (2.2 billion euros) and investments in the education sector (1.9 billion euros). These trends are sustained by investments on pan-European, national and regional levels.

Figure 2. The four general stages of the New Product Development cycle. The quality of decisions made to proceed from opportunity identification to development relates to the final success of an innovation.



Section 3: A new tool to guide PPPs in assessing innovation ideas

PPPs should select technical healthcare innovation ideas by answering seven questions

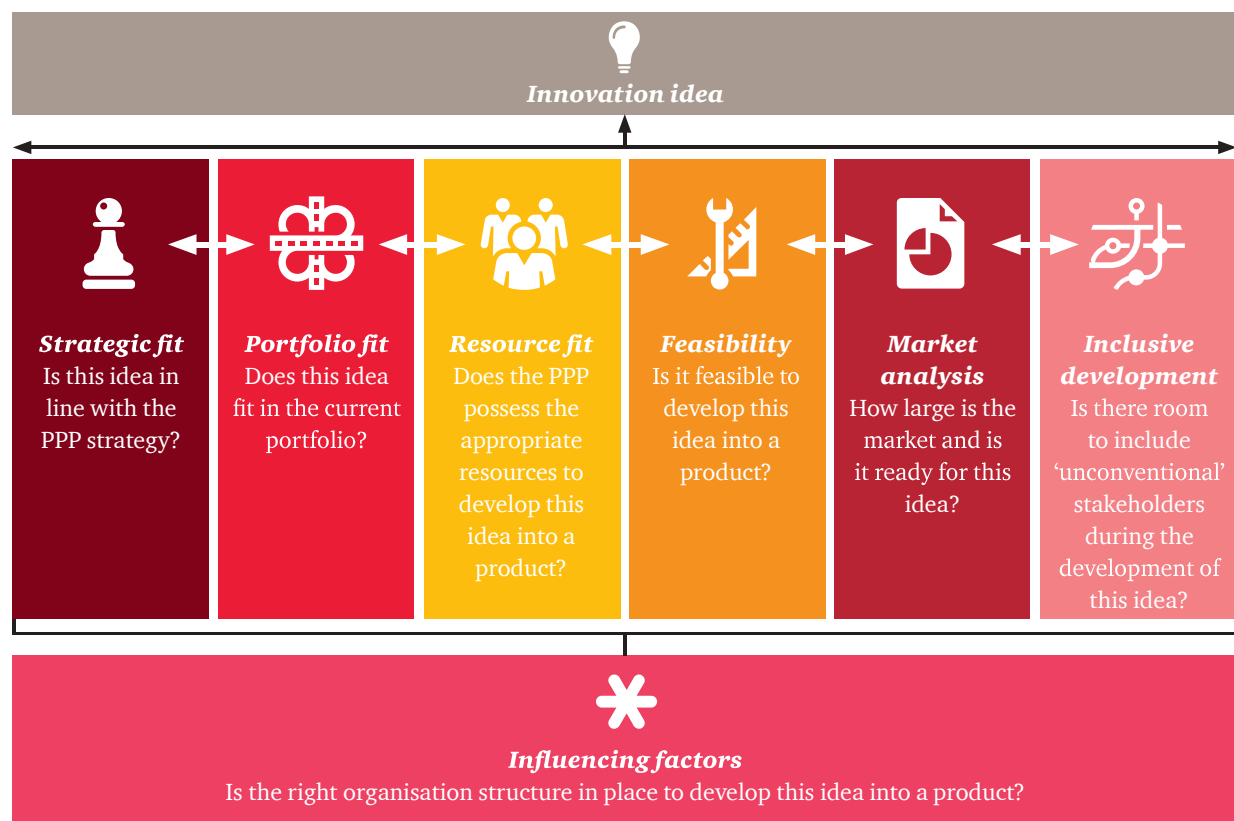
PPPs should scrutinise innovation ideas and conduct their selection by taking six dimensions into account, each comprising a number of criteria to support the decision process. Additionally, attention has to be given to factors that can influence the decision making process in a broader sense, such as the organisation structure and the trust level amongst PPP partners. Together, the six dimensions and the influencing factors make up seven questions.

Strategic fit should be the first dimension to be scrutinised, followed by the other five simultaneously. In the event of a negative strategic fit, the PPP should not pursue the innovation idea. Ideas that show no or less potential can be managed in five ways. These ideas can be recycled (sent back to the opportunity identification stage to be

perfected), put on hold (to be developed at a later time), sold to another party, used to write scientific publications for knowledge dissemination purposes, or discontinued entirely.

Depending on the goals and aspirations of the PPP, the degree of emphasis on the remaining dimensions can (and should) differ. For instance, a PPP focused on bringing innovations with a low(er) degree of sophistication to the market should put more emphasis on the criteria included in the market analysis dimension (e.g. product advantage, systemic & economic potential). This is in contrast to PPPs focused on bringing disruptive innovations with a high degree of sophistication to the next stage in the development process. For these innovations, more emphasis should be put on scrutinising criteria included in the feasibility dimension (e.g. technical feasibility, regulatory, ethical & cultural feasibility).

Figure 3. Criteria to be taken into account when conducting the selection



Is this idea in line with the PPP strategy?



Strategic fit

- Alignment with mission and vision of the PPP
- Value add for all PPP partners

An obvious first step in the selection of innovation ideas is that the idea has to fit with the vision and mission of the PPP and allow the PPP to stay true to its core focus and expertise. The idea also has to add value to all partners in the PPP. This is in contrast to private organisations that only focus on the value the idea adds to their own organisation. However, adding value to all partners can be challenging because the PPP partners may have divergent notions of the meaning of value. For instance, value can mean additional revenue for a private organisation active in the PPP, whilst it can mean additional scientific publications for a university partner, or the creation of social welfare for a governmental partner. Therefore, it is essential to know what each partner is expecting from the PPP collaboration and take these aspects into consideration when conducting the selection. This is not only essential for the development of the innovation idea into a product, but it also adds to the prosperity and the future success of the PPP.

“We have to move away from autonomous business thinking” – Ex CEO of a top tier Life Science company (2014 revenue, 10bn)

Does this idea fit in the current portfolio?



Portfolio fit

- Strategic portfolio fit
- Synergetic portfolio fit

The portfolio fit consists of two criteria: the strategic and the synergetic (???) fit. Comparable to a private organisation, PPPs should devise portfolio strategies looking at the composition of, and potential synergies between, projects in the portfolio. For instance, a starting PPP will almost always focus on the creation of radical innovations that can induce radical changes in their sector. In contrast, more mature PPPs might decide to invest 50% of their R&D budget in the development of incremental innovations to improve their existing offerings and invest the remaining 50% in radical innovations.

Both starting and mature PPPs should aim to select innovation ideas that complement and share human, financial and infrastructural resources. In this way, they can increase synergies in the development, marketing, launch and sales of their offerings. Focusing on increasing synergy in the portfolio during the idea selection stage will help PPPs manage the overall development costs, and in doing so, increase their profitability margins. Again, comparable to the strategic fit dimension, aiming to assemble the best possible portfolio is not only essential for the success of the individual ideas, but also for the future success and prosperity of the PPP as a whole.

“Looking at the properties of individual projects is only half of the equation” – Professor of Innovations studies at a world leading graduate business school

Does the PPP possess the appropriate resources to develop this idea into a product?



Resource fit

- Dedicated R&D resources
- Quality of the development team
- Distribution of the development costs amongst PPP

When selecting innovation ideas, PPPs should look internally and determine if they possess the appropriately dedicated financial, human and technical resources to develop that particular idea into a successful product. When not present, the PPP can look externally to determine if the missing resources can be acquired. This can be in the form of hiring the required people, developing the missing technical knowhow or inviting external companies into the collaboration.. However, this decision is contingent on the ability to find the right partner or company and to structure a deal of benefit to the PPP as a whole and not just the success of that single idea. In addition, it has to be financially beneficial for the PPP and a good cultural fit. Assessing the cultural fit between the partners is essential as cultural incompatibility is reported as one of the biggest challenges to successfully developing an innovation idea with new partners joining a PPP.

Furthermore, related to the quality of the development team, PPPs should always aim to link innovation ideas with innovation leaders. An innovation leader is described as an individual close to the development process with a strong entrepreneurial mind-set, equipped with the right skills to take ownership of the innovation and drive it forward. An innovation leader must be able to fully understand the idea and make the success of it his or her goal. Previous experience of owning or leading a start-up or a more mature company in the past and having experience with creating ‘winning products’ are key credentials.

“A great team with a low ambition is not interesting.” – Innovation manager at a Dutch PPP



Is it feasible to develop this idea into a product?



Feasibility

- Time to market
- Technical feasibility
- Financial feasibility
- Ethical & cultural feasibility
- Introduction requirements
- Regulatory feasibility

The feasibility of the innovation idea is related to the degree of difficulty involved in developing the idea into a final product. The criteria included in this dimension are the ‘usual suspects’ when it comes to selection of innovation ideas. A challenge for PPPs in particular is selecting an innovation idea that can fit the time horizon of the various partners. For instance, the public partners such as universities usually have time horizons of four years, allowing for PhD students to finish their research. In contrast, private partners have shorter time horizons due to a dependency of their financial goals on a timely market introduction of the product. Governmental partners in the partnership, in turn, are required by their constituents to show results before elections. This disparity in time horizon makes it difficult for a PPP to select an idea that fits each party’s planning.

In addition to the challenges in aligning the time horizons, it is essential for PPP partners to select ideas where they can best leverage their individual strengths (e.g. relationships in the healthcare sector, research facilities, easy access to the right human resources) in order to create an environment conducive to the successful development, launch and adoption of the innovation idea. We have called this criteria the ‘introduction requirements’. Introduction requirements are indicators such as the test bed of the innovation, the supply chain of the innovation and the supporting infrastructure of interacting devices and or third party applications.

“You do not want to be the only one in the world to have an innovation... you look if others have complementary technology...” – Innovation manager at a top tier Health Tech company (2014 revenue 20bn)



Does this idea fit in the current portfolio?



Market analysis

- Stakeholders identification
- Product advantage analysis
- Economic potential analysis
- Competitors analysis
- Market trend analysis
- Systemic potential analysis

An important selection step is conducting a thorough market analysis in order to obtain a complete view of the potential success of the innovation idea. The criteria included in this dimension are indicators that most organisations take into consideration when making these decisions. A big challenge within the healthcare sector is identifying the right stakeholders. There are three main stakeholders in healthcare:

- *The purchaser* in the healthcare sector can be a healthcare insurer, a municipality, a Ministry of Health, a group purchasing organisation or a combination of them.
- *The decision makers* can be individuals or entities that do not directly use the products but are called in to make decisions with regard to the usage or the purchase of the product by the end-user. These can be patients themselves, their relatives, hospitals, medical professionals, paramedics or municipalities.
- *End-users* are individuals or groups of people that use the products. These can be patients, medical professionals, paramedics or municipalities.

Having a clear and complete view of relevant stakeholders can allow for the identification of the size of the possible market in terms of yearly incidences of a certain condition, the number of people needing help, and other statistics that can give a quantifiable measure of the market. These measures in turn can help in selecting the most appropriate innovation idea for the PPP.

In addition to obtaining a thorough overview of the stakeholders, it is also very important to know the economic and systemic potential of the innovation idea. The economic potential of the innovation idea can be the financial gains that the innovation idea can yield for the PPP and/or its partners (Is the potential market worth 5 million or 50 million?) and the growth rate of the market and the scalability of the idea into international markets are relevant indicators. The systemic impact of the innovation idea is the potential to induce a change in the healthcare system. This change should improve the quality and efficiency of healthcare delivery while inducing a decrease in healthcare expenditures or radically improving cost-efficiency. Techniques used to conduct the systemic impact analysis can focus on cost-benefit analysis, cost-utility analysis or cost-consequence analysis, depending on the nature of the innovation idea. For instance, the introduction of an innovative device can enable a shift in healthcare from the second line specialist care to the first line General Practitioner (GP) care. This shift can lead to reduction in cost but also contribute to a more meaningful allocation of scarce medical resources. Conducting an adequate analysis of the consequences of the introduction of the innovation idea for all of the PPP partners is essential in an assessment. Such an analysis is a complex undertaking, but the expectation is that regulators and society at large will increasingly demand innovations that can be justified from a holistic healthcare system standpoint.

“The ease of use is key. In the end, the product itself will not be as important as the comfort that it can provide the end-user.” – Professor of Product Development at a Dutch University of Technology

Is there room to include ‘unconventional’ stakeholders during the development of this idea?



Inclusive Development

- Relevant stakeholder input collection
- Dissemination & commercialisation

In healthcare, innovation is often indirectly funded by insurance companies as they pay for healthcare services which have a component of technology. There must be a willingness to pay and a patronage from insurance companies with regards to innovation ideas that require their reimbursement. For these innovations our interview respondents mentioned the buy-in of insurance companies as key in the selection process.

Additionally, PPPs should try to gather information regarding the needs and desires corresponding to future innovations through consultation with all the relevant stakeholders. The frequency of these consultation meetings should be contingent on the confidence the PPP has within the specific field of innovation. For instance, round table sessions can be conducted with groups of respondents once a year for fields where the PPP is confident, and four times a year for fields in which their experience is lower. The entirety of the trends, desires and needs in the field at hand should be discussed during these sessions and the conclusions integrated within the development process.

“There must be a willingness to pay for the innovation from the market. This is in healthcare dictated by the insurance companies. If the insurance companies see a benefit in the innovation then the chance of it becoming a success will be higher because they will give the innovation time to prove itself.” – Innovation director at a world leading pharmaceutical company (2014 revenue 70bn)

Is the right organisation structure in place to develop this idea into a product?



Influencing factors

- Internal leadership buy in
- Gut-feeling
- Governance structure
- PPP partners’ agreements
- Trust

In addition to the six dimensions presented above, it is essential for PPPs to mitigate the effects of the influencing factors during the selection process. Characteristics of the PPP such as the governance structure, the level of trust amongst PPP partners, the agreements between the PPP partners with regards to distribution of costs and benefits, should all be clearly defined before the selection process. Appropriate governance structures, clear agreements, communication pathways and ways of working between partners will in turn increase the quality of the selection process and the overall collaboration. This is not a dimension of the selection process, rather a requirement of the PPP selecting the innovation idea.

The ability of the PPP to make autonomous decisions that are not influenced by the parent entities is essential in assuring that the ideas selected are in line with the goals of the PPP and that the idea offers the appropriate value to the participating PPP partners. As we mentioned before, value has a different meaning to different partners.

Section 4: What can PwC do for you

The innovation idea selection tool is part of our PwC Innovation & Development services. These services focus on aligning business objectives with a fit for purpose innovation strategy, resulting in improved profit for (and growth of) your organisation. By adopting a multi-disciplinary and cross sector approach taking into account our expertise across Advisory, Tax and Assurance we:

- perform international technology market studies to support our clients (and society) in understanding the societal implications and effects of (break-through) innovations;
- assist in the development of robust multidisciplinary roadmaps for technology platforms or ecosystems in line with market developments and trends;
- assist in the obtainment of relevant federal, provincial and or municipal tax and cash incentives to support the innovation activities of our clients (nationally and internationally through our Global Incentive Network);
- Assist our clients in identifying and defining their role in relevant ecosystems and public and private partnerships with the aim to help them create synergies and added value;
- offer holistic and implementation-oriented support to our clients by focussing on both strategy and operations activities and the alignment thereof;
- enable our clients to improve their competitiveness through optimising of the performance & process of the innovation portfolio in complex organisations in the short-term (higher R&D effectiveness, real open innovation in regional or international ecosystems) and a stronger and more innovative product / market position in the long term
- enable and create strong and mutually beneficial links between corporates, SMEs and start-ups to accelerate innovation.

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