

White paper

Innovation Think Tank Frameworks for resolving “The innovator’s dilemma” in healthcare

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Abstract

Innovators are constantly seeking the right challenges, stakeholders, and environment for implementation of novel ideas. Technological advancements in healthcare and their implementation require identification, development, testing, and validation of high impact use cases. Timing is crucial for successful market positioning and commercialization, which is highly dependent on 1) customer insights during requirements generation and 2) co-creation and validation of minimum viable product (MVP). One constraining factor is trust building with various healthcare system stakeholders as well as the current limited understanding of the entire product life cycle. The purpose of this paper is to firstly present Innovation Think Tank frameworks developed in the last 17 years at its various locations for knowledge reuse and opportunity and impact analysis for accelerating decision making, and secondly to elaborate the success factors and their role in the innovation life cycle.

300 project modules from a period of 10 years were analyzed by a team of 100 engaged employees across 15 ITT locations. Weekly outcome reports from these projects were clustered and key performance indicators (KPIs) were monitored and validated with the annual targets.

As a result, the ITT framework was visualized where intrinsic creativity, tools & methods as well as trusted partnerships for real-time customer feedback are identified as key success factors. This results in annual savings, additional revenue potential with new offerings and shortened time to market. The framework can be used for identification and evaluation of the opportunities and accelerating MVP creation, testing, and validation in customer environment.

Keywords: Innovator, Innovation Think Tank, Healthcare System, Co-creation, Innovation indicators, Siemens Healthineers

Introduction

Innovators are individuals or groups who create products and solutions for addressing societal needs, by pushing boundaries, challenging the status quo, and achieving growth. They can be entrepreneurs, but they can also be active and employed in companies and act as intrapreneurs.

Some of the challenges faced by these innovators are a) Difficulties in acquiring a project mandate, b) They often overlook the big picture that includes scope, stakeholders, pain-points etc., and thus experiencing analysis paralysis, c) They fail to identify and prioritize ideas holding the biggest impacts, d) They lack guidance on how to use appropriate mechanisms, and e) They often do not have access to environments to engage different entities for implementation and commercialization, f) or they lack resources, strategy, transdisciplinary, and time.

A number of these challenges contribute to the “The innovations dilemma” which spans from 1) selecting the right problem for research, 2) making a right decision for acquiring skills and education, 3) how much creativity is needed at a certain step considering the customer needs and available resources, 4) defining the starting point, 5) Opportunity / impact evaluation, to 6) choosing the right stakeholders.

Healthcare systems worldwide increasingly require innovators to come up with holistic and cost-effective solutions to address the needs of patients, providers, and payers due to limited budgets and rising patient populations. Healthcare in many countries is not providing care in a sustainable manner, they are largely based on lever-aging values for reactionary and acute care, which is not well suited to constantly increasing chronic disease burden on aging population. COVID 19 pandemic has revealed the need for disrupting healthcare delivery and adaptation of the societies with new technologies (e.g., for homecare, remote diagnosis, education, etc.).

Innovation Think Tank (ITT) is a global infrastructure of co-creation programs and labs established at Siemens Healthineers and several of its partner universities and hospitals. Its methodology includes elements ranging from acquiring a mandate for initiating projects to commercialization, covering the entire innovation lifecycle [1].

The Healthcare System Frameworks proposed by ITT engages stakeholders and decision makers to get insights into the trends and solutions [2] and with that may help to overcome the innovators dilemma of large companies.

ITT offers Expertise Development Programs (EDP) worldwide with a focus on innovation methodologies, entrepreneurship, and commercialization. ITT EDPs are experiential learning programs based on the experience of successful implementation and management of Innovation Think Tank programs and labs at Siemens Healthineers and several prestigious institutions worldwide. The interactive program is designed to develop creative pioneers capable of delivering innovative and customer centric solutions to the world’s greatest challenges in healthcare, in their own field of profession.

The program strongly focuses on making use of intrinsic creativity and various tools and frameworks for addressing customer needs. ITT EDPs have been offered at several prestigious institutions in the form

of Innovation Think Tank Certification Pro-grams, Innovation, Management and Leadership Certification, fellowship programs etc. in reputable global institutions such as Peking University, China; Imperial College London, U.K.; Technical University of Munich, Germany; Otto von Guericke University Magdeburg, Germany; Oxford University Hospitals, U.K.; FAU Erlangen Nürnberg, New York University Abu Dhabi; HS Coburg, Germany, University of Freiburg, Germany; OTH Amberg-Weiden, Germany; Vellore Institute of Technology, Texas A&M, Bogazici University, Acibadem Hospital Group and Hospitals, Georgia Institute of Technology, ERA Lucknow Medical College and Hospitals, Baskent Hospital Group and University, Fakeeh University Hospitals, Western University, Cana-da, University of Evora, Portugal and various Siemens Healthineers global locations [1] [4].

Material and methods

300 project modules were analyzed from a period of 10 years in 15 ITT locations with a team of 100 engaged employees [Table 1]. Project modules were categorized into 3 main levels: healthcare system level, departmental level, and system and component level. The weekly outcome reports including project data, stakeholder identification, and analyzed content were clustered and key performance indicators (KPIs) were monitored and validated with the annual targets.

Project module Category	Project data categories	Content analyzed	Project outcomes analyzed
Healthcare system level	Hospitals and healthcare systems of the future. Healthcare system analysis for Turkey, USA, India, China, South Africa, Egypt, Canada, Germany, South Korea, Austria, Italy, UK, UAE, Saudi Arabia, France	Patient journey, total healthcare expenditure, reimbursement model, healthcare policies, current trends, pandemic management, disease pathways	# Savings # Additional revenue potential created # Time to market
Departmental level	Radiology infrastructure of the future, radiology user interfaces of the future, laboratory workflow analysis for digitalization, other workflows (operating room (OR), emergency room (ER), intensive care unit (ICU), cardiology, catheterization laboratory)	Business models, process steps, current trends, KPIs, success factors	# Number of customer interaction sessions # Project modules reused # Project participants, expertise
System and component level	Computed tomography (CT), medical resonance imaging (MRI), X-ray, molecular imaging (MI), fluoroscopy, ultrasound, patient table	Modality workflows, business models, lifecycle visualization, technological and clinical trends, KPIs, success factors	

Table 1: Project data

Results

The ITT framework has been visualized with the core modules as shown in [Figure 1] and could be used during various stages of the innovation life cycle. Similar to the ITT Healthcare System Framework elaborated in [2], clinical workflow, technology assessment and business model modules support in capturing and validating trends, visualizing stakeholders, facts and figures, challenges, as well as identifies opportunities, best practices, and interdependencies. Several example pain points and

solutions for 22 different disease pathways have already been created and presented in [4].

An Innovation Think Tank Opportunity Evaluation Matrix (ITT OEM) supports assessment of business impact vs. effort for implementation [Figure 2]. Business impact consists of additional revenue potential created due to new features, savings, and disruption potential. All opportunities are relative to each other.

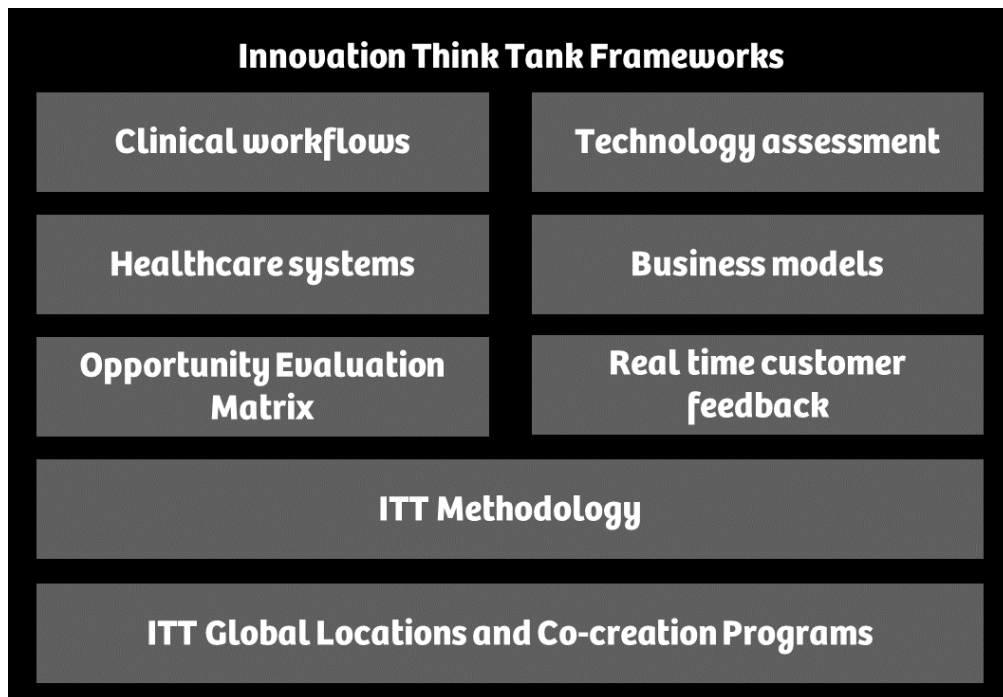


Figure 1: Innovation Think Tank Frameworks overview

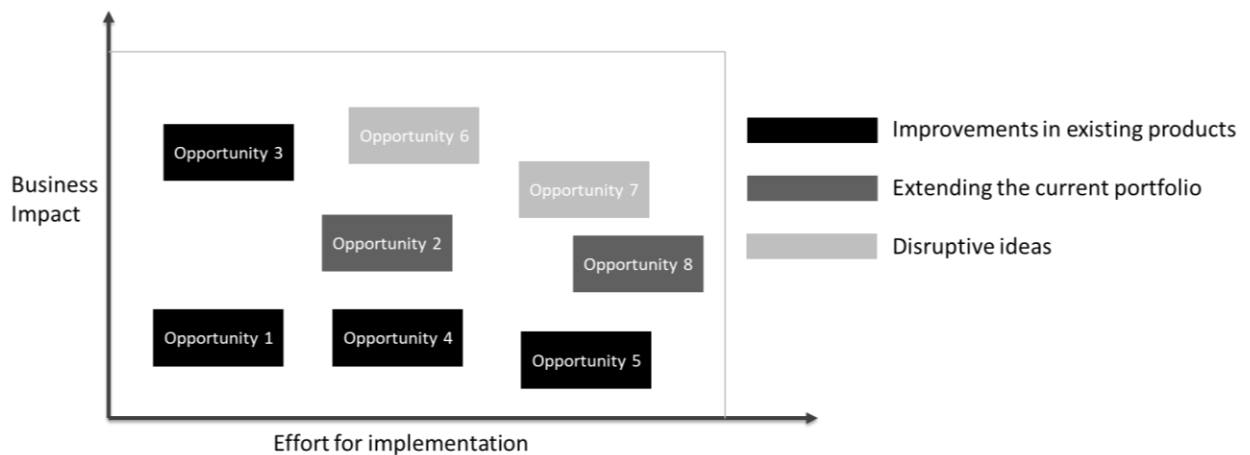


Figure 2: Innovation Think Tank Opportunity Evaluation Matrix (ITT OEM) supports assessment of business impact vs effort for implementation. Business impact consists of additional revenue potential created due to new features, savings, and disruption potential. All opportunities are relative to each other.

Intrinsic creativity, tools & methods and trusted partnership for real-time customer feedback have been identified as key success factors, resulting in annual savings and additional revenue potential with new offerings and shortened time to market [Figure 3].

The Innovation Think Tank framework connects all ITT locations worldwide where open innovation and co-creation programs result in the generation of knowledge (Technology trends, pathways, procedures, product requirements etc.).

For a new project request, a semi-automated ITT Framework proposes reusable assets as competencies, tools, customer environment, templates, and locations. The new project outcomes are curated and indexed within the ITT framework [Figure 4].

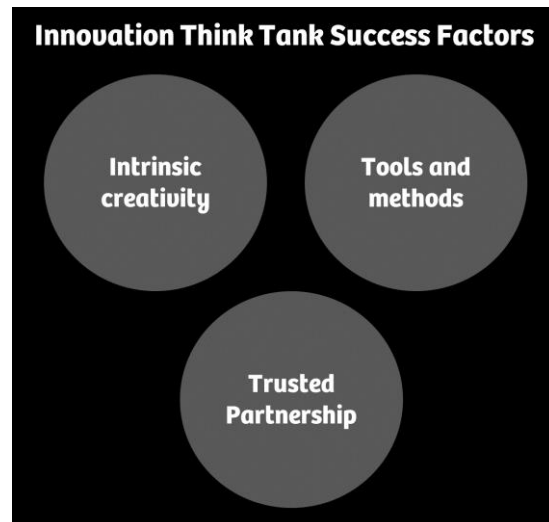


Figure 3: Innovation Think Tank success factors

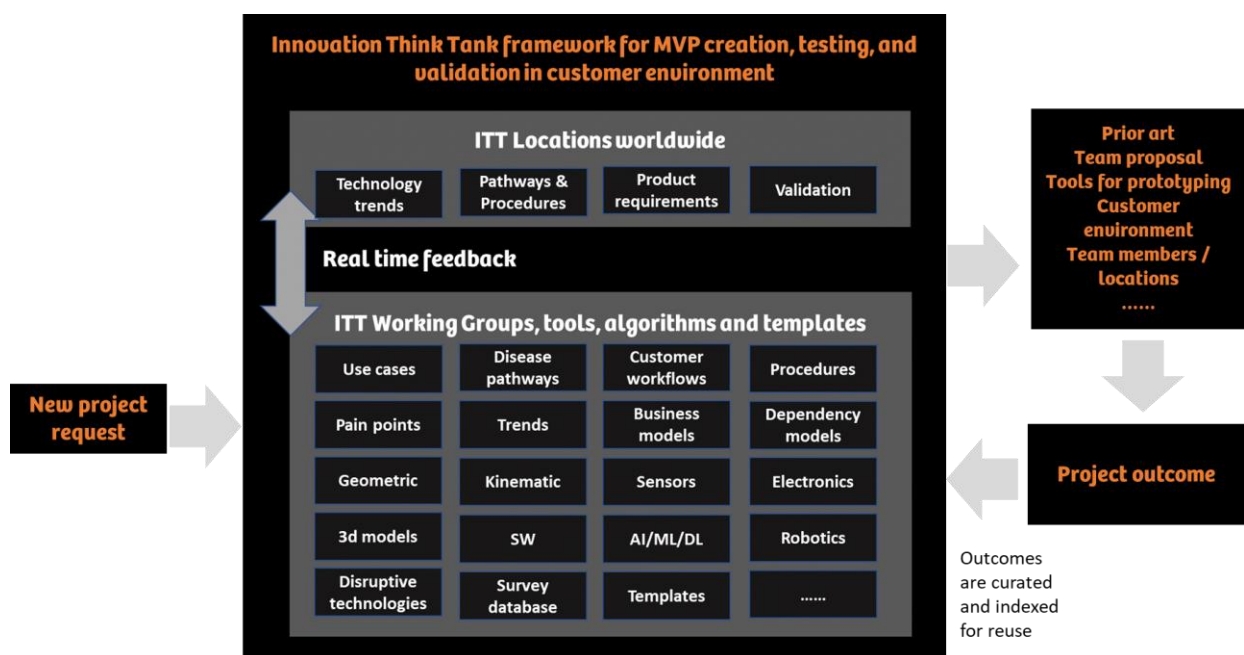


Figure 4: Innovation Think Tank knowledge reuse leading to accelerated decision making and shortening time to market and savings

Discussion

The ITT Frameworks aid in resolving the innovator’s dilemma by 1) providing a systematic approach for acquiring mandate and accelerates decision making by utilizing prior knowledge and its trans-disciplinary global infrastructure 2) Real time customer insights support the creation of a big picture and support engagement with the users and decision makers 3)

The opportunity evaluation matrix supports the business impact calculations with respect to a required effort for implementation 4) The clinical workflow, healthcare systems and technology assessment modules in combination with ITT methodology provide guidance throughout the innovation lifecycle 5) The globally connected ITT

locations and co-creation programs offer access to environments for implementation and commercialization (ITT Labs, Expertise development Programs, ITT Investor ecosystems etc.)

Some limitations of the innovation approaches have been observed, when individuals or groups: a) focus too much on tools and methods rather than making use of intrinsic creativity (human ability to identify patterns, trust, relationships, decision making, risk taking etc.) b) do not invest enough on partnerships and remain in silos. This is the reason, the three-success factors were highlighted [Figure 3].

Here is a list of key recommendations identified by the ITT Framework during the analysis of the

projects, the challenges that arose and the success factors identified to optimize the product lifecycle.

Deal with imperfect situations by making use of intrinsic creativity: While dealing with imperfect situations, which could happen during the various project phases – changing environment, customer expectations, team changes, one should not only rely on standards processes, which might not be for imperfect settings. Here making use of intrinsic creativity is extremely beneficial which includes abilities and instinct of human beings. Some examples are illustrated in Figure 5.

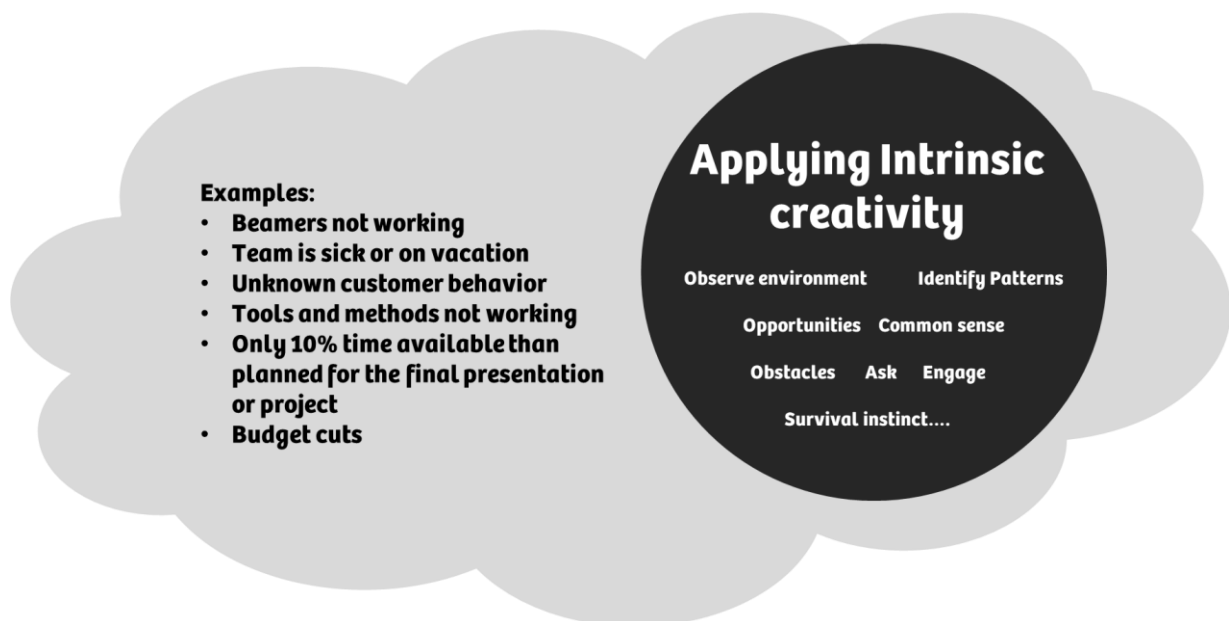


Figure 5: Dealing with imperfect situations - Practicing for making use of intrinsic creativity

Be careful with the creativity trap and not losing the customer focus: Innovators (also the aspirants) should pay special attention to the creativity trap and not losing the customer focus. This means not only choosing the most innovative solutions but the appropriate one with sensitivity to available resources and time. Figure 6 depicts example for a customer ordering food in the restaurant who gets something else by mistake or because of

unavailability of the option. If this comes as a surprise and the customer doesn’t want it, would result in disappointment. Even worse would be a highly unusual situation where a creative chef, delivers completely unexpected food to the customer and which is not desirable / acceptable for the customer. This could result in waste of creativity and resources. One solution to pursue creativity further would be first delivering what customer asks for and prime with new feature/ product to get feedback as shown in Figure 6.

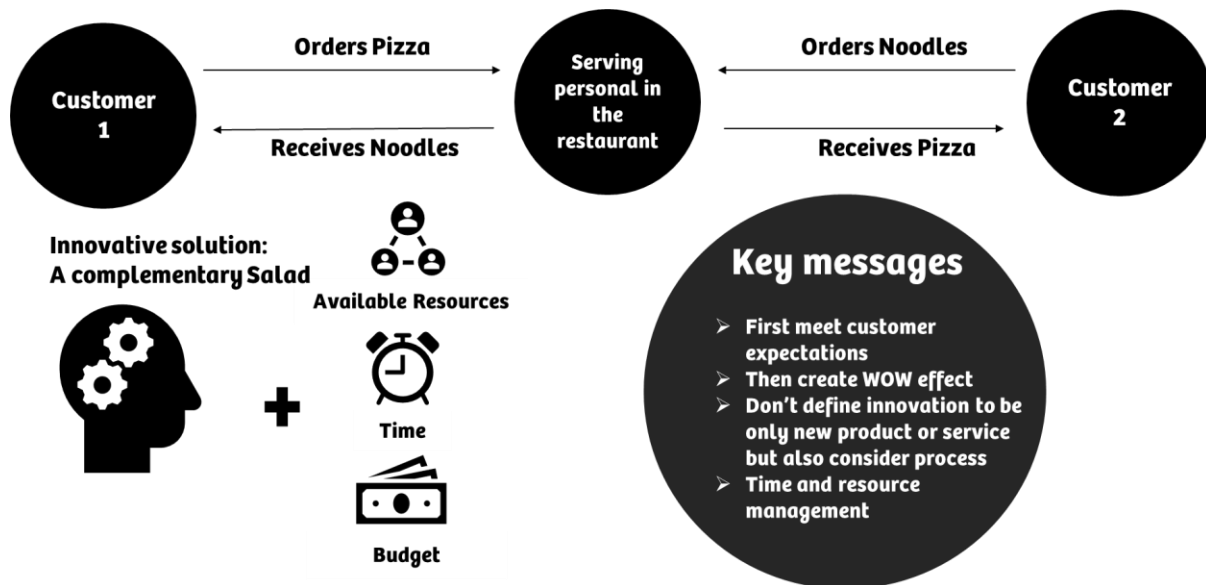


Figure 6: Be careful the creativity trap and customer focus - Not only choosing the most innovative solutions, sensitivity to resources and time

Giving options to decision makers creates flexibility and could widen the scope: Addressing customer requirements is one of the integral parts for innovation process. It becomes important to look through different perspectives and alternatives for identifying key value propositions. Offering options to decision makers can strengthen the deliverable according to their focused preferences. Figure 7 outlines the ideology of ordering food in restaurant, no single customer can deny ordering at least one item from the list of food mentioned in menu. The

menu provides range of choices through which customer’s preference can be satisfied. Unavailability of choices can be one of the causes for customer dissatisfaction. Providing options assures that decisions are not only restricted to certain aspects like just yes or no, but also gives flexibility in decision making process which increases the scope of creative outcomes and optimize the time and resources spent by focusing on different possible solutions instead of wasting all the energy and organizational assets into one solution.



Figure 7: Giving decision makers options - Creating flexibility and introducing wide area of scope

While being attentive to customer requirements, the innovators should also emphasize on consolidating different phases of process to capture and visualize given efforts and resources during each phase.

Figure 8 portrays an example template for quantifying efforts at every step of process starting from how many resources from different background and locations are allocated followed by numbers of articles and contents analyzed to define state of art, similarly other phases can be quantified which results

in consolidating key outcomes at the end. Here showcasing roadmap and utilized abilities during process not only increases credibility of the solutions

but also acknowledge and bring a sense of appreciation to the given efforts.

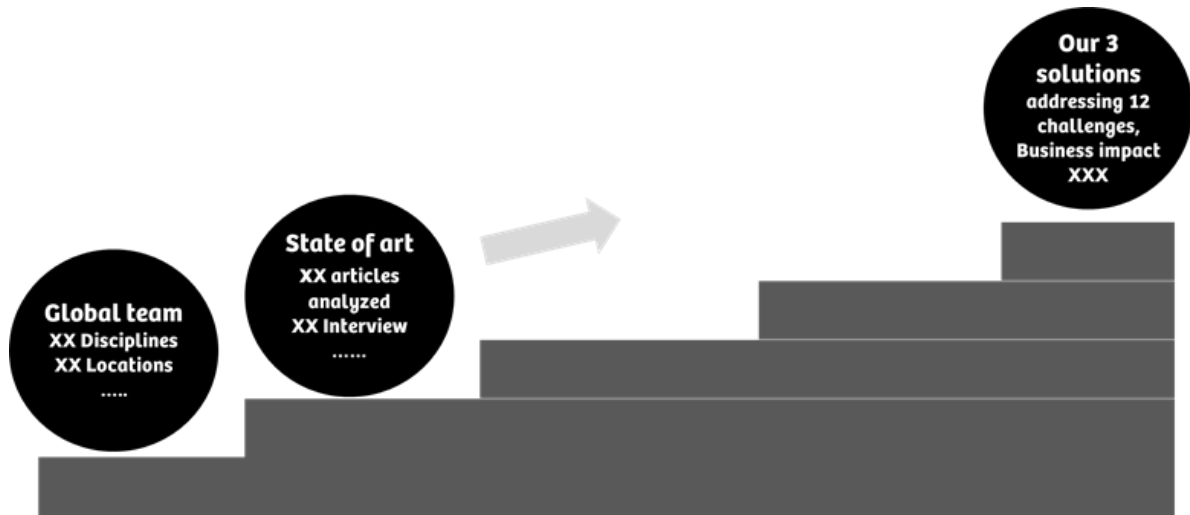


Figure 8: Quantifying efforts, showcasing roadmap and abilities - Increases credibility of the solutions and appreciation of efforts

When identifying different solutions and value propositions within the ecosystem we usually end up analyzing a portion of problem space for specific areas. Innovations from the lens of big picture considers focusing on key root cause analysis which includes not only identification of various challenges, trends, vision/mission or organization goals but also highlighting detailed factors such as resource

planning, communication and interactions. Here Figure 9 illustrates that for creating a holistic approach in innovation one must connect the dots and keep focus on the big picture to identify possibilities across the innovation lifecycle.

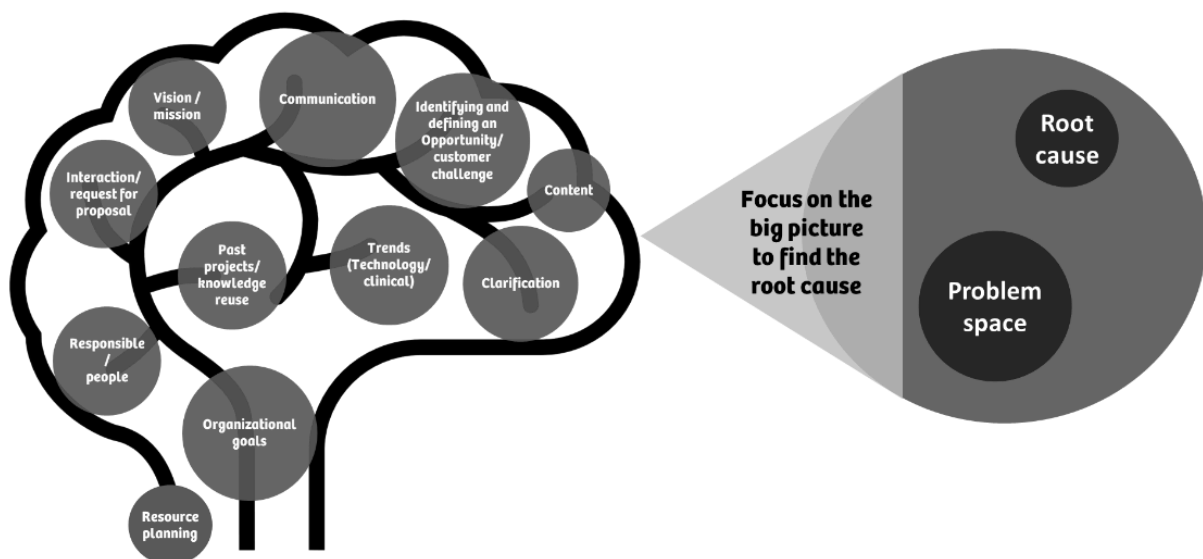


Figure 9: Connecting the dots and keeping focus on the big picture - Across the innovation lifecycle

The starting point - Creating capacity within the existing environment: Often new ideas, stimulated by inspirations, customer insights, interests, skills etc. for their implementation require changes and additional resources in the Existing Environments (EEs). Disruption or transforming EEs is not always possible in short term due to unclear impact and could discourage the innovators or aspirants. A

starting point could be creating capacity within EEs by a) understanding the EEs overall organizational / societal goals, b) Identifying dependencies and interfaces, c) Appreciation of success factors d) Reuse knowledge e) Convincing and partnering with the stakeholders f) Defining contributions and acquiring resources for implementation [Figure 10].

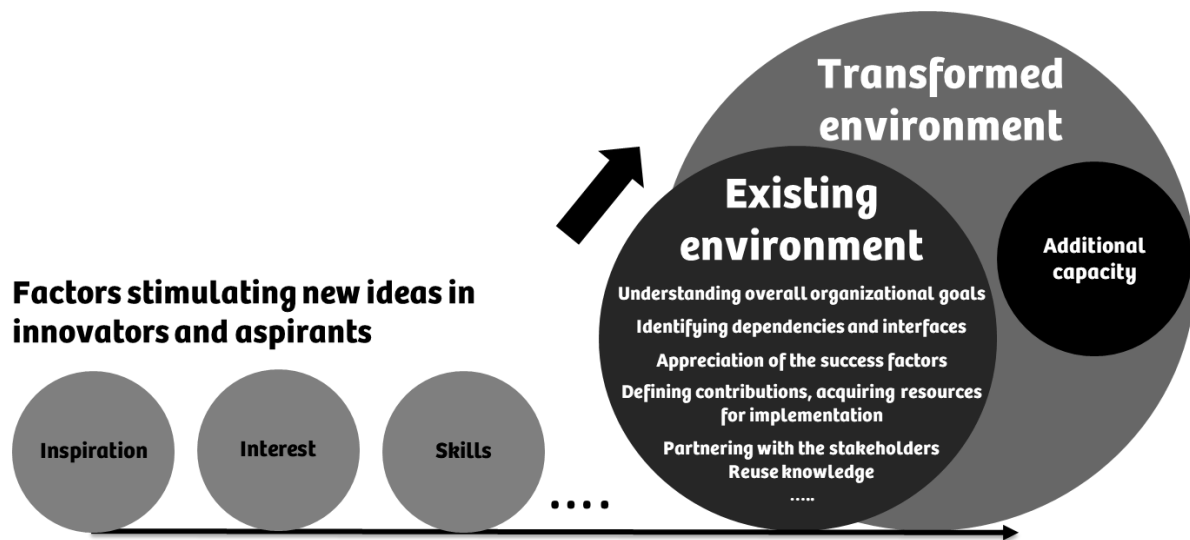


Figure 10: The starting point - Creating capacity within the existing environment

Overcoming bias - Creation of interest in the field: Biasing acts as a stumbling block for innovation process and could take place during interactions with customers, suppliers, investors, within own teams, and against oneself.

Being aware of it and of others could help in identifying ways to address it. Some of the recommended traits which could help the innovators overcome the bias are mentioned in Figure 11.

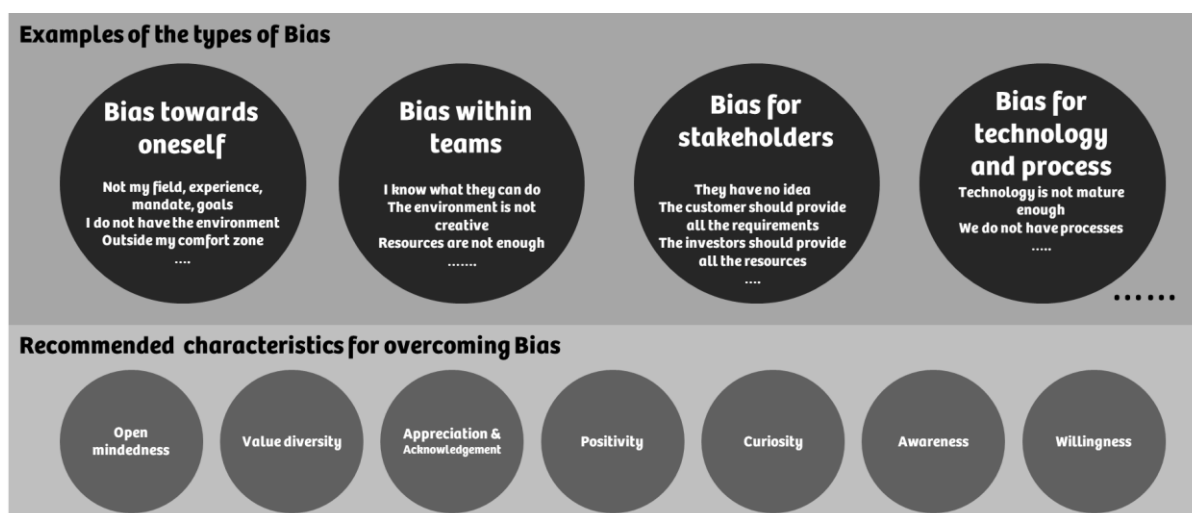


Figure 11: Examples of bias and recommended characteristics for overcoming them

Keeping and nurturing the innovation spirit: Being an attractive field, innovative environments attract attention of individuals who sometime underestimate the continuous learning requirements, operative tasks efforts for sustaining and developing or do not fully utilize the possibilities. This could lead to deterioration of the creativity, quality of the outcomes, attractiveness of the

environments, and productivity loss. To keep the motivation on the same or even on higher level, an innovator should keep focus on increasing trust with stakeholders leading to customer pull, portfolio expansion, adjusting innovation processes, upgrading skills, and more importantly interest in the field [Figure 12].

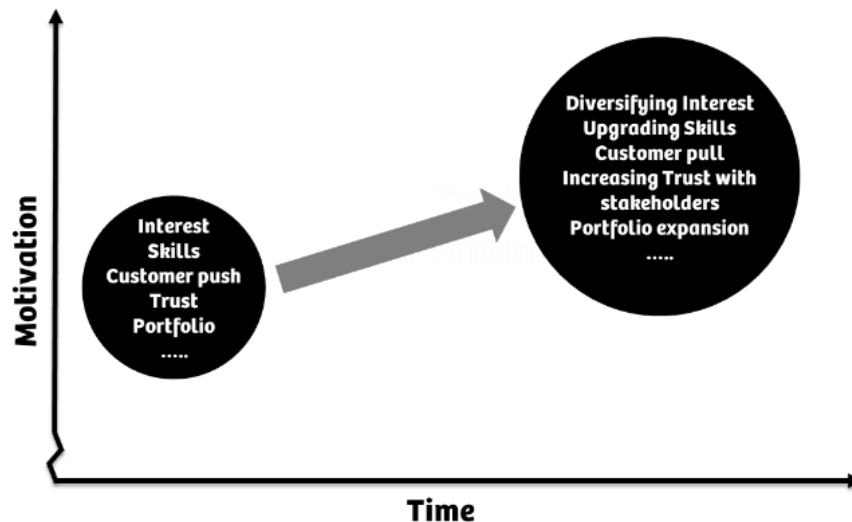


Figure 12: Keeping and nurturing the innovator spirit

Conclusion

An innovator in the healthcare domain creates and commercializes products, solutions, and services for addressing needs of its stakeholders such as patients, care providers, payers etc. The role is crucial in disrupting healthcare systems direly in need of cost effective and sustainable solutions due to the increasing patient population worldwide. The Innovation Think Tank framework could be used for identification and evaluation of the opportunities and accelerating MVP creation, testing, and validation in customer environment.

Aspiring individuals and organizations could go through the ITT white papers, frameworks, lab tours, disease pathways, co-creation program outcomes and choose the elements according to their requirements. The open innovation approach offers participation possibilities in various ITT programs [5].

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Prof. Sultan Haider is the global head of Siemens Healthineers Innovation Think Tank (ITT), which was established in 2005. His inspiring vision of innovation culture formed Innovation Think Tank to become a global infrastructure of 72 activity locations (Innovation Labs, Innovation Think Tank certification programs) in Germany, China, U.K., India, USA, UAE, Turkey, Canada, Australia, Egypt, Saudi Arabia, Portugal, Switzerland, Brazil and South Africa.

Prof. Haider has filed over 500 inventions and patents and under his leadership, ITT teams have worked on over 2500 technology, strategy, and product definition projects worldwide. He is a Principal Key Expert at Siemens Healthineers (SHS), a title awarded to him by the SHS Managing Board in 2008 for his outstanding innovation track record. Furthermore, Prof. Haider has been awarded honorary directorships, professorships and has developed innovation infrastructures and implemented innovation management certification programs for top institutions.

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