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Innovation Screening and Mapping: Analysis and Indexing

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INNOVATION SCREENING AND MAPPING: ANALYSIS AND INDEXING

PROJECT DESCRIPTION

INPUT

The Client is interested in selling or licensing patent-protected technologies and need a high-level assessment of where they fit into the landscape of similar patents. The Client has requested Novocus to prepare an operating procedure and sample for this task.

This document would describe in detail procedure followed by Novocus for a higher level assessment synchronized with innovation potential of a technology across various sectors and within same technical sector.

Two examples are presented in this report. They are:

1. From domain of radar electronics
2. From domain of optical physics

These example have been used as a demonstration tool for describing the procedure mentioned below.

SIGNIFICANCE OF INNOVATION SCREENING

In the highly competitive world of knowledge driven economization, innovation is the key to success. But, without some way of screening innovation, firms would merely be gambling, which would be high risk and might prove to be low return from a cumulative perspective. These innovations are however related to high technical, market, organizational, and resource uncertainties.

Innovation is one of those definitions where different authors and different institutions have dissimilar views of the term. Some define innovation as an iterative process where an invention is commercialized through development, production and marketing tasks. Some define innovation as an idea, which might be a recombination on old ideas or unique approaches to something, which is perceived as new to the individuals involved. Hence, an innovation might be regarded as an imitation to some, but new to others, and will thereby still be regarded as an innovation to those involved.

In order to supply state of the art solutions on a systems level, new technologies must be continually mastered, even before they are required in final products. The components that result from this drive are also products in their own right and can be used as building blocks by other system suppliers. This concept of technology stacking often disturbs the precarious balance between innovation, development, and commercial advantages. Often, building blocks required for product development may not be end products for any industry but nevertheless important for overall development and success of certain products. Often, a technology can involve more than a few of such building blocks thereby leading to questions like commercial viability and cost benefit ratios. Often, a technology can have cross industry applications and developers might be so focused on current need of the invention, that rest of the potential can go largely ignored. All these scenarios lead to less than optimal commercialization.

Hence, there is a need for a holistic innovation map and spillover analysis before pursuing patent protection for any technology or product/process idea. This concept would also be equally applicable for early stage technologies and cases where commercialization needs to be done based on prototypes.

The innovation index is designed to provide up-to-date information about progress in a specific technical field.

For a client who is contemplating entry into a particular field, the results of an innovation map and spill-over analysis results may approve or disapprove the advisability of such a decision. For

a client currently active in a particular field, the innovation map and spill-over analysis results can lay out the path that must be followed for optimal commercialization.

When faced with a technical problem, there is no better way of determining what solutions already exist than by looking at patents. A State of the Art Search allows a client to learn what technology already exists, how such a technology came about and then to build on it. **An innovation map and spill-over analysis will also allow a company to spot new competitors and to identify new technological trends**.

In most cases, the innovation map and spill-over can prevent a client from technical black holes that look like technical white spaces on a landscape map.

Also, the innovation map and spill-over analysis can go a long way in identifying potential out-licensing opportunities for a given patent portfolio.

A THEORETICAL EXAMPLE FROM RADAR ELECTRONICS DETAILING NEED AND IMPORTANCE OF STATE OF ART SEARCHING

A modern radar system utilizes an extraordinarily wide range of technologies. Robust mechanical structures are needed to house and protect the system and sophisticated management of shock, vibration and other environmental factors is required. High precision electro-mechanical systems requiring a marriage of mechanical, electrical and power electronic subsystems point and stabilize the antenna. The antenna itself and the microwave and RF electronics that form the heart of the system require sophisticated design techniques.

The signal processors that extract information from the received signals are reliant on the latest digital technologies to attain the high processing speeds required to meet ever-increasing client requirements. Therefore, it is very much apparent that radar technology is an amalgamation of various technologies and heavily relies upon electromechanical systems and micro-electromechanical systems. This observation makes any innovation study related to this technical domain not only an amalgamation of different technical domains like electrical,

electronics, and mechanical sciences, but also an amalgamation of many interdisciplinary fields like material sciences, nanotechnology, micro technology and bioelectronics.

METHODOLOGY

The project will be completed in four stages classified into 2 phases involving the following methodology:

- Phase 1
    - Asset Assessment
    - Secondary Research
- Phase II
    - Value Analysis
    - Recommendations

They are explained below.

Phase I: Asset Assessment and Secondary Research

1. An understanding will be developed based on the input provided by the Client.
2. Brainstorming to identify the key attributes of the technology described in the input.
3. The key terms will be used to determine the search strategy and formulate initial search strings in order to search similar patents. The search string that will be used to conduct search for patents and published applications (patent publications) and non –patent literature relevant to the scope of the project.
4. Secondary research on publicly available information (including patent databases), where one or more portfolio's attributes were identified and a patent landscape accompanied by graphs would be generated for same technical domain.
5. Identifying a preliminary set of market applications relevant to the patent portfolio. This would be give us what place a particular portfolio or patent has within similar patents.

6. After this, would start phase II of the project where detailed innovation map would be made and spillover analysis would be carried out (Explained Below).

Phase II: Value Analysis and Recommendations

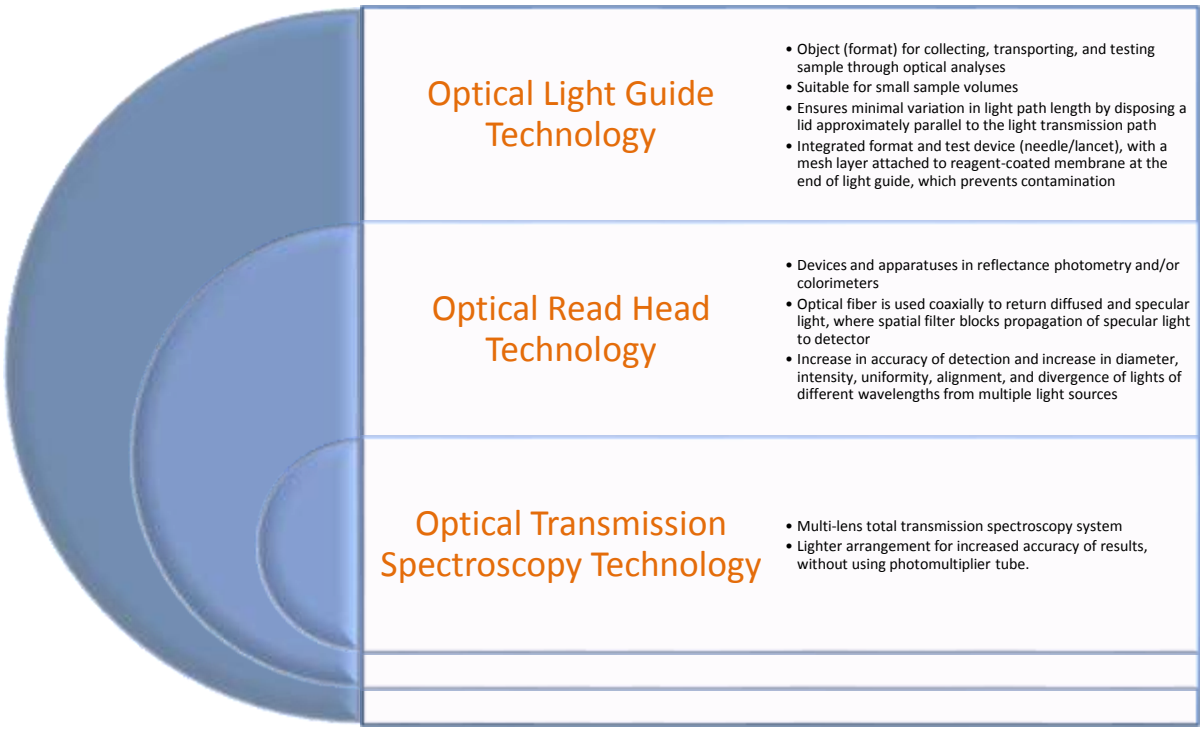
1. The technology landscape generated above would be used to generate innovation map through detailed citation analysis and inventor association analysis.
2. Forward and lateral citations for multiple generations would be mapped for technical features. These technical features would then be mapped over market applications through secondary research.
3. Technology shift from various generations of citations would be mapped and documented. These would be a direct indicator of spillovers and out-licensing opportunities.
4. Novocus will provide proof of activity in each of the technical features identified through above process. This would enable a strategist or decision maker more equipped with possible opportunities in a technical sector.
5. This will be a higher level assessment of value that can be generated from a patent or a portfolio.
6. Deeper and more detailed initiatives including white space technical technology scape for cross industry potential would be generated as per client interest and requirement.

NOTE: THE PROCESS DESCRIBED ABOVE WOULD BE CLEARER FROM A LIVE STUDY DEPICTED BELOW. PLEASE NOTE THAT COMMERCIAL USE OF CONCLUSIONS DERIVED FROM THIS STUDY IS PROHIBITED AS THIS IS FOR REFERANCE PURPOSE ONLY.

EXAMPLE - OPTICAL PHYSICS: APPLICATIONS AND OVERVIEW

PATENT PORTFOLIO – OPTICAL AREA

- Portfolio includes 10 patent publications (9 US patents and 1 US published patent application)
    - Optical Light Guide Technology
        - US 7,820,107 – Optical reagents format for small sample volumes
        - US 7,964,412 – Optical reagent format for small sample volumes
        - US 20080064939 – Light Guide Test Sensor For Use In Determining An Analyte In A Fluid Sample And Methods For Manufacturing The Same
    - Optical Read Head Technology
        - US 7,154,592 – Multiwavelength readhead for use in the determination of analytes in body fluids
        - US 7,304,743 – Diffuse reflectance readhead
        - US 7,483,141 – Diffuse reflectance readhead
        - US 7,724,374 – Coaxial diffuse reflectance read head
        - US 6,181,417 – Photometric readhead with light-shaping plate
    - Optical Transmission Spectroscopy Technology
        - US 7,787,109 – Transmission spectroscopy system for use in the determination of analytes in body fluid
        - US 7,869,009 – Method for determining an analyte concentration in a fluid



The above figure demonstrates aforementioned patent portfolio classified into sub-sets based on technical features.

Each of these sub-sets would now be analyzed for cross industry innovation prospects.

TECHNOLOGY MARKETS & APPLICATIONS IDENTIFIED BASED ON PHASE 1 OF PROJECT AS DESCRIBED ABOVE:

☐ **Broad-level patent analysis lead to identification of the following products that use similar and related optical technology**:

- Printers and imaging products (such as cameras)
  - Representative Assignees: Epson; Fujifilm; Sony; Canon
- Optical Media Solutions
  - Representative Assignees: Samsung; Sharp; Matsushita; Hitachi-LG; IBM; Philips
- Microelectronics, Photolithography
  - Representative Assignees: IBM; Intel
- Telecommunication/Networking
  - Representative Assignees: Fujitsu; Sumitomo; NEC; Lucent; Hitachi; Siemens; Motorola

Representative Assignees can be potential out-licensees or competitors depending upon objective of assessment.

☐ **Broad-level applications for a targeted set of patent publications in similar technologies**:

- Microscope photographing devices such as inverted microscopes
- Ellipsometry
- Electronic endoscopes
- Photolithography used in a manufacture of semiconductor devices
- Photography camera
- Analyze water and gas samples for contaminants and other metallic content
- Optical coherence tomography used in interferometers
- Examination of gemstones (such as diamonds)
- Solar energy conversion
- Fluoroscopy
- Detection technique for chemical or biochemical analysis
- Communication system using an optical link and optical devices
- Optical metrology (used in semiconductor fabrication)
- Aviation (air detection; range imaging in wind turbines; others)

SOME OF THE APPLICATIONS SO IDENTIFIED ARE PRESENTED BELOW

Technical shift, inventors assessment, citation assessment leads to potential market applications in various technical sectors not initially planned by inventor.

Based in market applications so identified for cross domain or various apparently non related technical sectors; Novocus conducts and overview market research to identify proof of activity in order to filter black holes from opportunities.

APPLICATION DETAILS

Agricultural Sciences	Soil Sciences	Germanium Detectors	Link	Analysis of agricultural products
	Fertilizer Sciences	Agilent 720-ES	Link	Analysis of Fertilizers
	Horticulture	Iguazu II-IR™, i-I/Q/CCD Monochromatic™, i-I/Q/CCD Bichromatic™	Link	Optical sorters of horticultural products

Biotechnology	Tissue Culture	Biosera FBS	Serum and cell culture
		Inverted tissue Culture PZQ-105	Serum and cell culture
	Food Processing and Packaging	Open Country Food Slicer 150W 7.5" SS Blade	Food Processing and Packaging
	Fermentation Technology	Ocean optics	Monitoring Fermentation Environment
	Detection and Analysis of Biochemicals	ALPHA Wine Analyzer	Improved wine analysis, utilizing the ATR (Attenuated Total Reflection)
		minispec TD-NMR Analyzers	Quality Control Systems
		Germanium Detectors	Analysis of Protein, Blood Samples
	Medical Diagnostics	ThunderBolt ELISA Platform	Result Analysis
	Auto-Immune Testing	CARIS	Result Analysis

Automobile technology	Automobile Technology	LED T5 B8.3d Car Bulb	Automotive parts (bulbs)
	Combustion Engines	Fibre Optic Pressure sensors	Monitoring parameters like pressure using optical fibres
	Lock and Key Fittings	Car Central Door Lock	Sensing Application

Heating Appliactions	Electric Heating	Fibre Optic Temperature Sensors for industrial Application	Fibre Optic Temperature Sensors for industrial Application
	Heating applications as in case of furnace	NREL's Optical Cavity Furnace Brings Together a Myriad of Advances for Processing Solar Cells	NREL's Optical Cavity Furnace Brings Together a Myriad of Advances for Processing Solar Cells

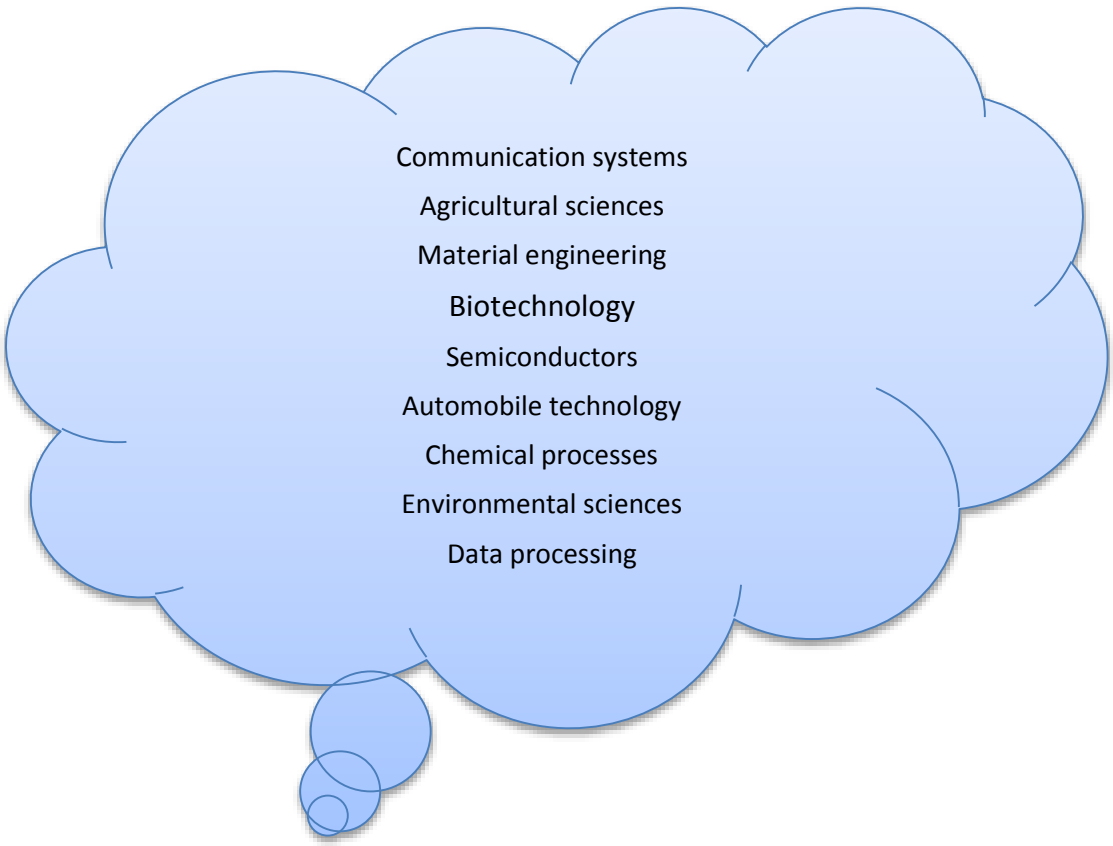
Microscopy	Microscope Photographing Devices	Raman Spectrometers and Microscopes	Research and process control solution
	Scanning Probing Application	academia	Lab Applications
		multi view 1000	Lab Applications
	Endoscopes	Hysteroscopes	Surgical Application
		Arthroscopes	Surgical Application
		Sinuscopes	Surgical Application

PLEASE NOTE THAT LINKS ARE SHARED ONLY FOR ONE TECHNICAL DOMAIN AS REFERANCE TO SECONDARY RESEARCH DONE TO ACCUMLATE PROOF OF ACTIVITY IN TECHNICAL AREA IDENTIFIED THROUGH SPILL OVER AND CROSS INDSTRY ANALYSIS.

NOVOCUS WILL ALSO PROVIDE A LIST OF PLAYERS FOR EACH TECHNICAL AREA IDENTIFIED.

These are some of the technical areas identified from analysis of Phase II. Tables presented above provide a detailed description of result tables. However, all the areas identified in a broader perspective are listed below.

What we observe here is a spill over top view of the portfolio mentioned above.



RECOMMENDATIONS

Brainstorming session with Client to review the preliminary and cross industry applications and screen on the basis of various parameters to identify the final set of applications that may be of interest for further detailed analysis.

Also, deeper and more detailed initiatives including white space technical technology scape for cross industry potential would be generated as per client interest and requirement. This could include:

1. Cross-Industry Commercialization Aspects

2. Vertical Externalities—Knowledge spill overs in same technical domain for advancement of technology

3. Horizontal Externalities—Knowledge Spillovers across various technical domains and geographical boundaries

4. White spaces—Technology gaps or nascent areas of development within a particular technology domain. Though many methods exist for white space analysis, but very few, if any rely on technical content on all axis of a multi-dimensional analysis.

5. Black Hole Identification—Black holes are a mandatory side –effect of any white space analysis. When we map white spaces, we get technology areas that seem to be unexplored based on patent data and literature. However, the truth may be that these areas are akin to black holes and that are not to be invested into at all. There is a very precarious balance between white spaces, and black holes. It is absolutely necessary to have demarcation indicators in order to successfully evaluate any technology portfolio.

6. Research Indicators– This is also an important aspect of technology commercialization and portfolio development. Investing or commercializing a technology after development is quite different from developing a technology after realizing commercial potential. Main objective of this exercise is to establish various research direction indications in which an organization may

invest so as to best optimize current assets and develop more assets in return. This phenomena can be equated to a financial investment giving capital gains as well as steady interest income.

PROJECT ORGANIZATION

Novocus proposes the following protocol to facilitate smooth and timely completion of the project:

- A single person contact, appointed on behalf of Novocus, will communicate with the Client and will be responsible for the deliverables.
- A Client-appointed nominee will interact with Novocus for all project-specific discussions.
- The project will be considered complete when it is concluded and delivered by Novocus to the Client's satisfaction, along with all supporting documentation.

We request you to please contact the undersigned in case of any queries related to innovation maps and spillovers or Intellectual Property in general.

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