Guidebook of IP/Technology Transfer

Track 1

Entry-level Tech Transfer Professional

Topic 1.8.1

The Tech Scoring Template;

Refining the Relation of Inventiveness, & Market Relevance

The Tech Scoring Template

Ten-point Technology Scoring Template

- A useful tool for initial evaluation of inventions, considering the several (10) different factors that affect ultimate viability for commercialization and implementation
- The tool has 10 categories
- Categories scored 1 (lowest) to 5 (highest)

  Lowest score possible = 10

  Highest score possible = 50

Ten-point Technology Scoring Template

Ten Categories

Scoring: 1-5 (50 max)

A Triage Scoring Template: the 10 categories

1. *Description of Invention and Inventiveness*
2. *Potential Value of Intellectual Property*
3. *Market Relevance*
4. *Market Size & Characteristics*
5. *Value Proposition/Potential for Reasonable Business Model*
6. *Potential for Significant Economic Value*
7. *Stage of Development/Technology Readiness*
8. *Scale-up Feasibility*
9. *Support, Funding and Resources*
10. *Existing or Potential for Private-sector Partnerships*

A Triage Scoring Template: Scoring

Score each category 1-5

1= Very Unfavorable

2= Unfavorable

3= Neutral

4= Favorable

5= Very Favorable

A Triage Scoring Template: the 10 categories

1. ***Description of Invention and Inventiveness***

Does the Invention Disclosure thoroughly and clearly describe the invention; what it is and how it works?

Are the inventive features clearly delineated and explained?

Do the inventive features appear to be technically meaningful/significant?

(not simply a distinction without a difference)

Are the superior performance features described clearly?

Does it work?

As hoped?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

2. *Potential Value of Intellectual Property*

Is it patentable *vis a vis* the prior art

Is there an issued or pending patent on the invention?

Do the claims effectively cover the invention?

Will the claims be reasonably enforceable?

In which countries do potential or existing patent claims exist and are these relevant to the market for the invention?

Are other types of IP possible or existing (trademark, copyright, Plant Breeders' Right, Trade Secret)?

Is there potential or existing "bioproperty" that may have value in commercialization of the technology?

1=VeryUnfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

3. *Market Relevance*

Does the invention solve a problem that is economically meaningful?

Is the problem widespread and significant or localized and trivial?

Is there a definable market for the problem solved?

How does the technology compare to existing solutions to the problem?

1=VeryUnfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

4. *Market Size & Characteristics*

Is there one or more identifiable markets for the problem solved?

How large are these markets?

Are the markets characterized by few/large firms or many/medium-small firms?

Will these markets sufficiently value the problem solved?

Does governmental regulation have a significant impact on the market for new products/services?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

5. ***Value Proposition/Potential for Reasonable Business Model***

Can at least one "value proposition"

(Quantitative Benefit – Quantifiable Cost = Value)
be described and substantiated for the invention, in at least one market application?

Is the value proposition feasible?

Can at least one reasonable business model be elucidated in conjunction with the selected value proposition?

Is the business model suitable for: 1) disruptive/paradigm shift; 2) revolutionary; 3) incremental (large or small) innovation?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

6. *Potential for Significant Economic Value*

Does the combination of value proposition, market size, business model, and market characteristic establish the basis for significant economic value?

Will the realization of that value require very large, large, moderate, or small investment and will the potential return on that investment be sufficient to justify the investment required?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

7. *Stage of Development/Technology Readiness*

What is the current stage of technical development of the invention (idea, “test-tube proof”, bench-test validation, extensive testing, pilot scale, beta-test in application, etc)?

What level of risk (that the technology will not work as expected/hoped) is the technology currently at?

Will the steps to lowered technical risk be relatively easy or difficult (in terms of time and money)?

Will the cost required to de-risk the technology be overcompensated by the potential return on investment (see previous category)?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

8. Scale-up Feasibility

Can the technology be cost-effectively scaled-up to a level of profitable manufacture or service delivery?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

9. *Support, Funding and Resources*

Are there resources readily available to further develop the invention (money, staff, facilities)?

Is development funding readily available?

Are there additional resources available that might play a role in development of the technology from its current stage to commercialization?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

A Triage Scoring Template: the 10 categories

10. Existing or Potential for Private-sector Partnerships

Do relationships with private sector partners exist? Are these partnerships closely linked to commercialization activity?

1=Very Unfavorable 2=Unfavorable 3=Neutral 4=Favorable 5=Very Favorable

Refining the Relation of Inventiveness, and Market Relevance

Our Discussion Today

- It all begins with “inventiveness”
- Inventiveness and its two components:

  uniqueness & superiority
- “Uniqueness” compared to the prior art
- Prior art configures the invention
- “Superiority” compared to existing solutions
- Existing solutions relates to market relevance
- Examples

It all begins with Inventiveness

- Defining the Inventiveness of an invention is the first, and most important step
- Essential to understand:
  1) the unique aspects of the invention
  2) if/how those unique aspects confer some performance advantage/superiority
- Defining the unique aspects and the performance advantages they confer = inventiveness

It all begins with Inventiveness

- If an invention does not have any unique aspect, it is not inventive, and almost certainly not viable
- If an invention has a unique aspect, but that uniqueness does not confer any advantage/superiority, it is not inventive…. and almost certainly not viable

Inventiveness examples

Invention: *a toothbrush with a red handle*

unique?

no → not inventive, not viable

Invention: *toothbrush with neon-pink bristles*

unique?

yes (none in prior art)

do neon-pink bristles confer an advantage?

NO → not inventive, not viable

Inventiveness examples

Invention: *a toothbrush with a red handle and bristles of anti-biofilm graphene*

unique?

Yes, no such bristles in prior art

uniqueness confers performance advantages?

Yes, biofilm removal from teeth

Invention is Inventive

Uniqueness of an Invention

- Define the invention and determine the key words
- Conduct a key-word based prior art search
- Carefully examine the closest prior art patents

  (use the 1st independent claim to compare)
- Also look for similar inventions in tech literature
- Define precisely how the invention is different

  from the prior art - precisely

Prior Art Configures the Invention

The Invention:

A special toothbrush

Prior Art Configures the Invention

The Invention:

A special toothbrush

How does it work

and why is it “special”?

- Curved handle
- Bristles made of Teflon (Polytetrafluoroethylene)

  impregnated with silver ions
- Bristles in a unique, spiral pattern

Prior Art Configures the Invention

A toothbrush with curved handle, Teflon/Ag bristles in spiral pattern

- Eliminates 90% of biofilm-forming bacteria from oral surfaces
- Typical toothbrush removes 5-25% of such bacteria

Closest Prior Art:Special Toothbrush

Keyword	# of database hits
Toothbrush	29,000
Toothbrush & curved	19,000
Silver ions & antimicrobial	7,500
Toothbrush & curved & Teflon bristle	900
Toothbrush & bristle & pattern	75
Toothbrush & Teflon bristle& silver & pattern	6

Closest Prior Art

CA890,587: antimicrobial floss with Ag particles

DE129-1987: curved toothbrush with circular pattern bristles

CN875,098: toothbrush with Teflon bristles

UK3-09839: brush with spiral pattern bristles

IN909-498: antibacterial fabric with Ag coating

US9,450,750: electric toothbrush with spiral pattern bristles of Teflon

Are the elements of this invention essential for its performance qualities?

- Curved?
- Teflon? Other polymer?
- Spiral pattern?
- Ag?

    Ag particle size? Distribution in polymer?

Prior Art Configures the Invention

The Invention:

A toothbrush

using polymer bristles,

impregnated with Ag ions,

in spiral pattern

Superiority/advantages of Uniqueness of an Invention

- Evaluate each unique aspect of an invention and determine what advantage and/or superior performance characteristic is conferred by that uniqueness
- Consider all the unique aspects together to determine if the combination *per se* confers some advantage(s)/superiority

Inventiveness example

Invention: *hairbrush with red handle, biodegradable bristles, password-protected locking mechanism*

Red handle inventive?

no

Biodegradable bristles inventive?

unique but is this trait an advantage?

Locking mechanism inventive?

unique but probably not an advantage

The Importance of Inventiveness

- Inventiveness is the cornerstone of patentability

  and……

- essential to commercializing new technology
- Inventiveness = unique + superiority/advantages

  Unique (compared to what?)

  Superiority/advantages of the unique features
- Defining Inventiveness of a new technology

  carves out the scope of patentability,

  which produces market relevance,

  and establishes the value proposition

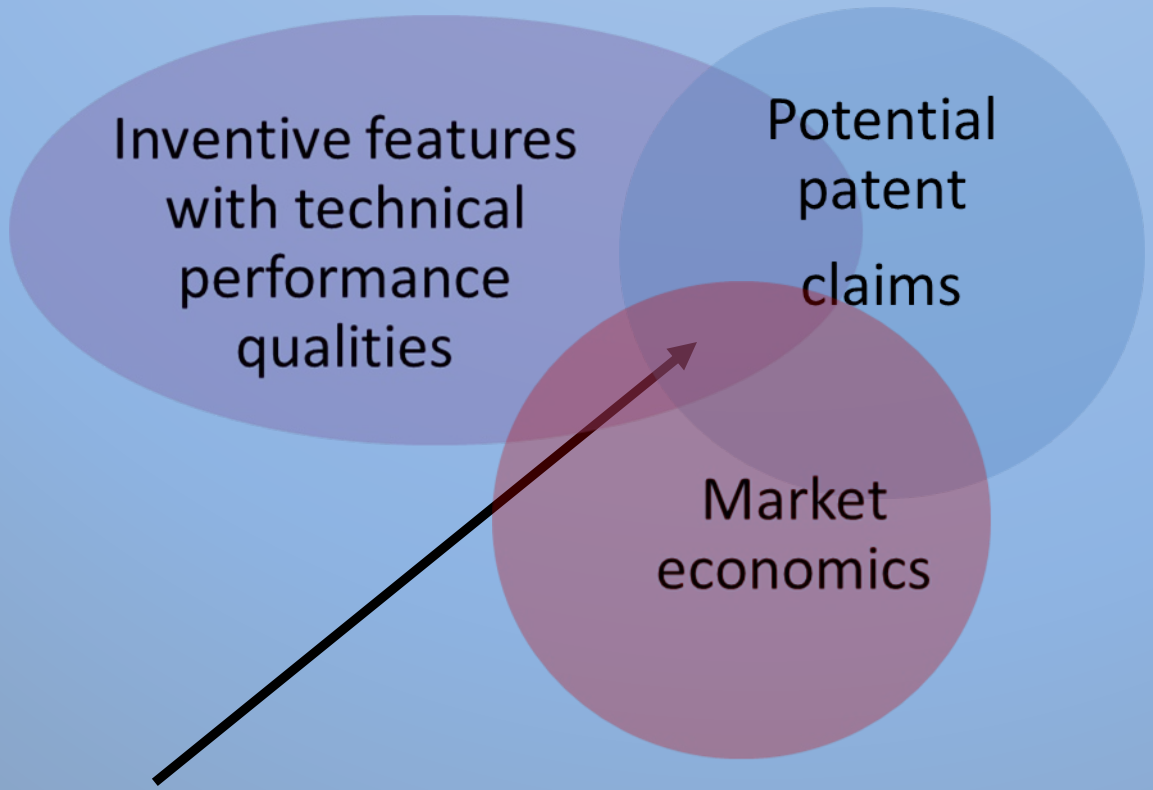
The Triple Convergence:

Technical Performance,

Inventiveness

&

Market Relevance



Invest in these: inventions with superior performance, market relevant economics, and meaningful patent claims

The Impact of Inventiveness and Patent Claim Scope on Market Relevance

Scope of Claims

What is claimed is:

1. A writing instrument

that is hand-held,

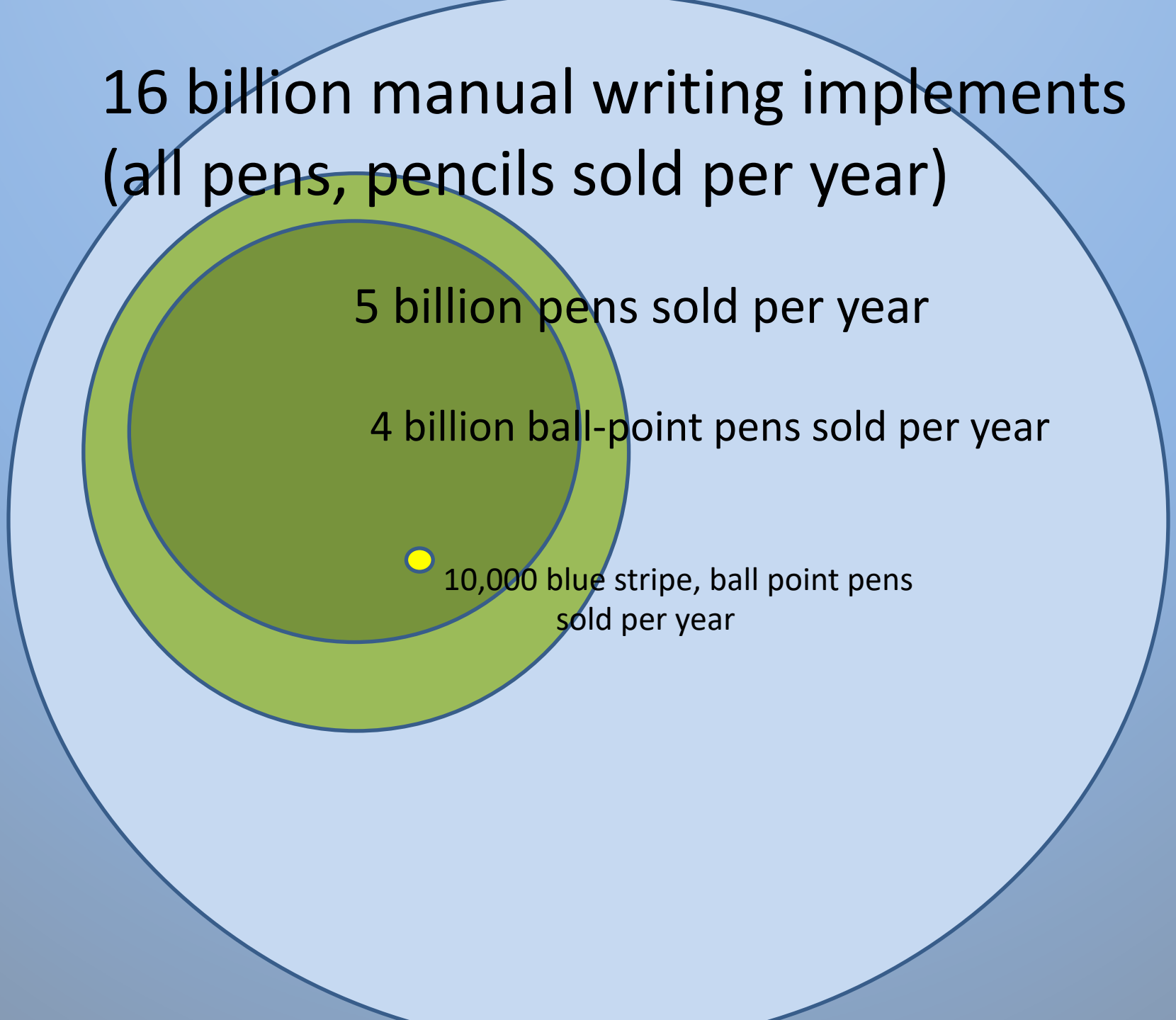
cylindrical, and containing an ink reservoir,

with a ball apparatus at one end of the cylinder that delivers ink from said reservoir to writing surface only during the act of writing,

and wherein the ink-delivery emitter device is retractable,

and the cylinder is blue-striped.

16 billion manual writing implements (all pens, pencils sold per year)



Finding the triple convergence: the process

Thoughtful evaluation and this 4-step approach:

1. Define the invention, its inventive features, and their technical performance qualities
2. Determine the Property Control Position (IP & bioproperty) quality and its relation to the performance qualities
3. Link technical performance to market relevance (economics)
4. Connect technical performance,

   Property Control Position

   market relevance,

Case Study

The Invention:

Ultrasonic mixing of baking batters and doughs

The Invention:

Ultrasonic mixing of baking batters and doughs

What is it exactly?

- Method and device to add ultrasonic energy into a liquid to enhance fluid mixing

How does it work?

- Attachment of ultrasonic transducer to mixing bowl
- Variably adds ultrasonic energy to bowl contents via rheostat control

The Invention: Ultrasonic mixing of baking batters and doughs

What are the inventive features with technical performance qualities

- Ultrasonic mixing of batters/doughs creates certain type mixing (micro-emulsions) not possible with other methods
- Ultrasonic mixing of batters creates unique rheological and structural properties of batter…..

…. and baked product

The Invention: Ultrasonic mixing of batters and doughs

Property control position quality

- Many uses of ultrasound in prior art
- Ultrasound transducers in prior art
- Ultrasound mixing of fluids (not baking) in prior art
- No ultrasound mixing of baking batters/doughs in prior art ("unexpected result" = inventiveness)
- Specific configuration of transducer and mixing bowl not in prior art

✓ **Patentable:** Ultrasonic mixing of batters/doughs and specific configuration of ultrasonic transducer/mixing bowl

✓ **Trade Secret:** special mixing procedures

The Invention: Ultrasonic mixing of batters and doughs

Property control position quality

- Many uses of ultrasound in prior art
- Ultrasound transducers in prior art
- Ultrasound mixing of fluids (not baking) in prior art
- No ultrasound mixing of baking batters/doughs in prior art
- Ultrasound mixing in non-foods and food-related fluids
- ("unexpected result"

  = significantly improved results (data)

= inventiveness)

The Invention: Ultrasonic mixing of baking batters and doughs

What is the market relevance?

- Ultrasonically mixed batters/doughs produce baked goods:
  - without synthetic chemical additives
  - with unique mouthfeel, flavor, color, and flavor properties

Don't forget negative factors:

- Ultrasonic device adds new cost to equipment
- Any significant change to baking procedure?

Case Study: Baking technology

Technical features & performance characteristics

Ultrasonic mixing produces nanoemulsions in fluids

A Case Study: Baking technology

Property Control Position:
Patentability vis a vis prior art
Trade secret on procedure

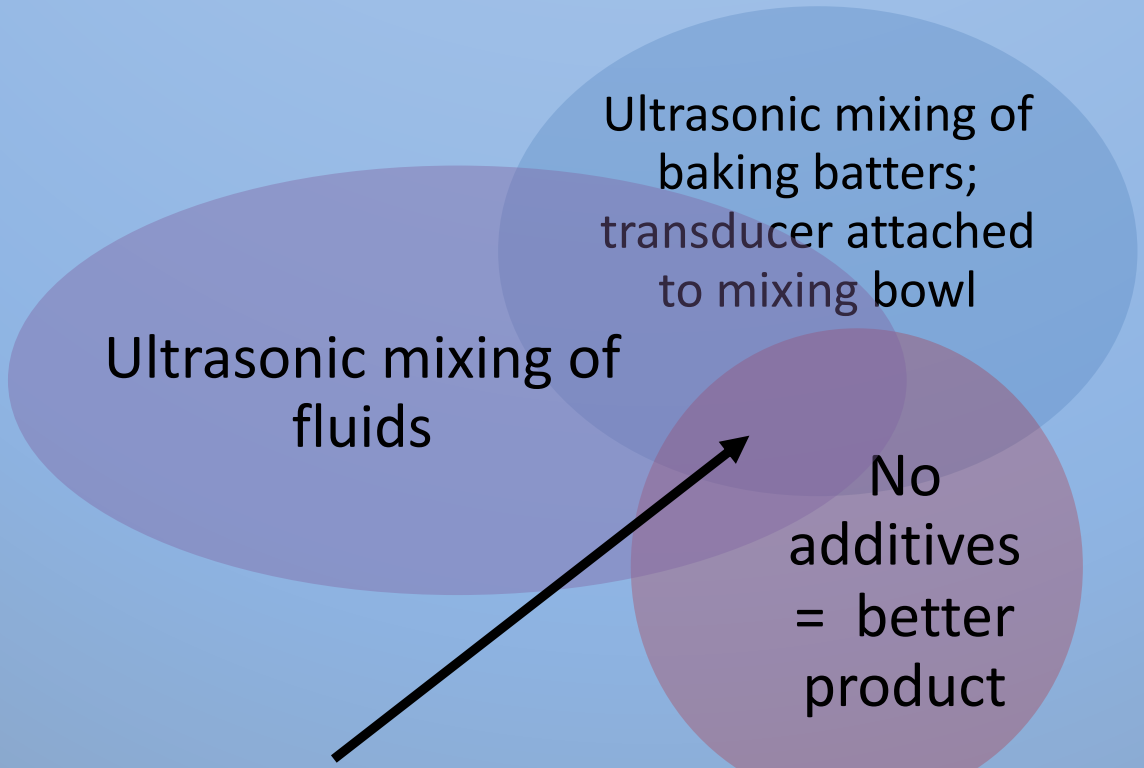
Ultrasonic mixing of baking batters/doughs; transducer attached to mixing bowl

A Case Study: Baking technology

Market relevance

How will it enhance profitability?

Case Study: Baking technology



A protectable patent with meaningful claims that will produce novel products that the market wants

Case Study

The Invention:

Biodegradable, transparent film packaging made with natural materials exhibits antimicrobial and antioxidant properties

The Invention: Biodegradable, transparent film packaging made with natural materials that exhibits antimicrobial and antioxidant properties

What is it exactly?

- Nano-emulsion of Zn-oxide nanoparticles, essential oil, surfactant, in a biopolymer (ratio of pectin/gelatin) matrix

How does it work?

- Slow-release of essential oil
- Zn is also bioactive
- Mixing is critical (nano-micelles), micro-emulsion doesn't work

The Invention: Biodegradable, transparent film packaging with antimicrobial, antioxidant properties

Inventive features with technical performance qualities

- Antimicrobial and antioxidant properties
- Can be formed into any geometry (thin film, 3-D)
- Water-soluble emulsion easy to make; water-insoluble when dried
- All materials are safe for human consumption, environmentally “friendly”
- Films are strong and elastic
- Readily biodegradable

The Invention: Biodegradable, transparent film packaging with antimicrobial, antioxidant properties

Property control position quality

- Biopolymer-based materials (pectin, chitosan, gelatin, alginate, etc) in prior art
- Biopolymer-based materials with essential oil (lemongrass, tea-tree, etc.) in prior art
- Biopolymer-based materials with essential oil and nanoparticles of Si in prior art

✓ **Patentable:** Materials of certain biopolymer-mixture ratios, with Zn-nanoparticles, essential oil, and surfactant; made into a nano-emulsion; nano-emulsion into films, sprays, 3-D objects

✓ **Trade Secret:** special mixing procedure

The Invention: Biodegradable, transparent film packaging made with natural materials that exhibits antimicrobial and antioxidant properties

What is the market relevance?

- Antimicrobial/antioxidant packaging

  = longer food shelf-life
- Manufacture cost is low
- Strong, elastic, water-resistant
- Other applications? 3-D? biomedical devices?
- Biodegradable
- Insecticidal

The Invention: Biodegradable, transparent film packaging with antimicrobial, antioxidant properties

Link technical performance to market relevance (packaging)

- ✓ Extended shelf-life for fruits & vegetables
- ✓ Easy to manufacture (water-soluble)
- ✓ Durable after drying (water-insoluble)
- ✓ Strong & elastic, transparent or opaque
- ✓ Cost effective

Invention Analysis: the process

Thoughtful evaluation and this 4-step approach:

1. Define the invention, its inventive features, and their technical performance qualities
2. Determine the Property Control Position (IP & bioproperty) quality and its relation to the performance qualities
3. Link technical performance to market relevance (economics)
4. Connect technical performance,

   Property Control Position

   market relevance,

Inventive features with technical performance qualities

antimicrobial, antioxidant, water soluble/insoluble, strong&flexible

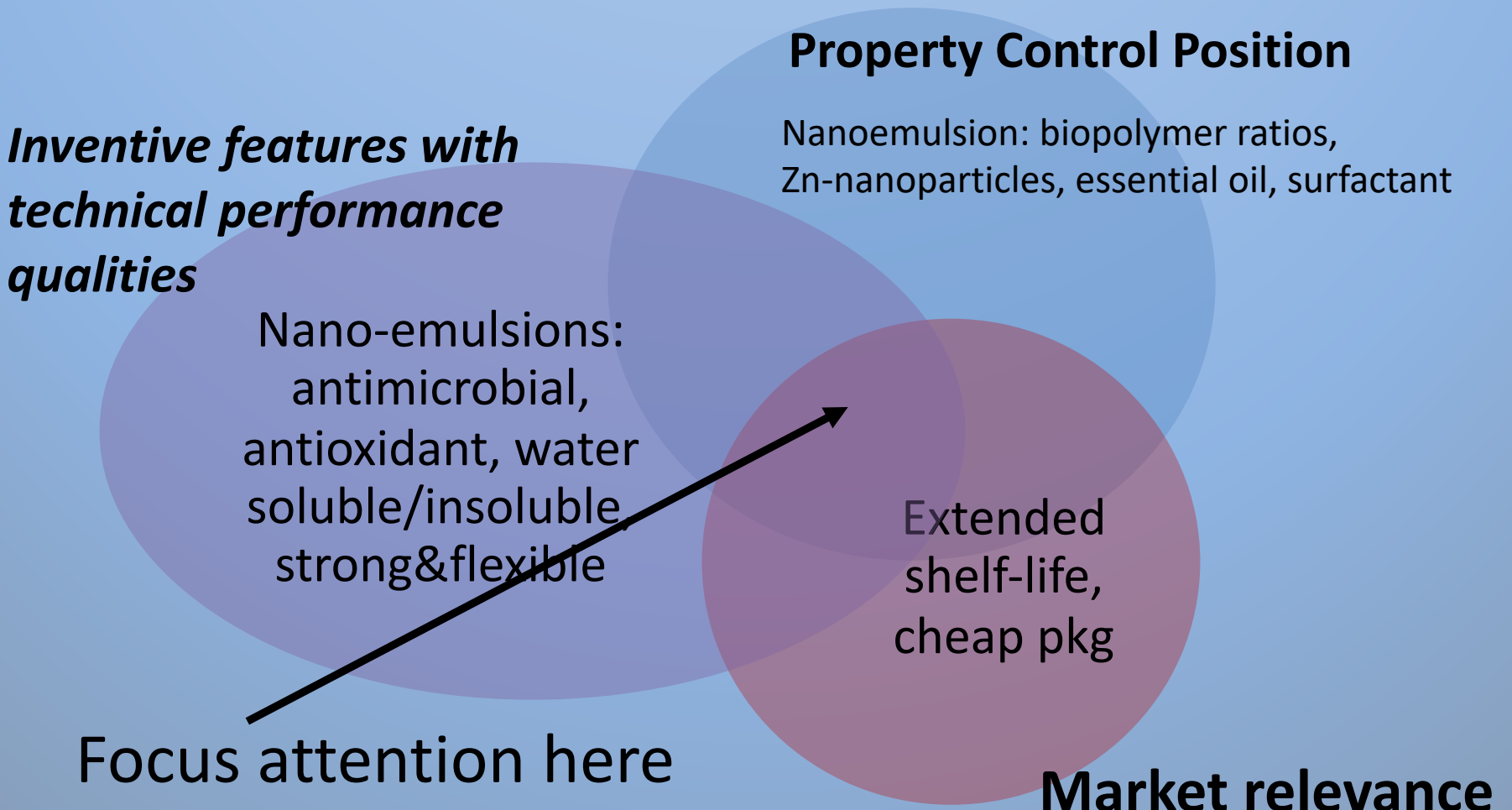
films, objects

Property Control Position

Patent: nanoemulsion: biopolymer ratios, Zn-nanoparticles, essential oil, surfactant
Trade Secret: mixing method

Market relevance

Extended shelf-life, antimicrobial, biodegradable, low-cost pkg, objects


Property Control Position
Nanoemulsion: biopolymer ratios, Zn-nanoparticles, essential oil, surfactant
Inventive features with technical performance qualities
Nano-emulsions: antimicrobial, antioxidant, water soluble/insoluble, strong&flexible
Extended shelf-life, cheap pkg
Focus attention here
Market relevance

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Thank you