STEINBEIS UNIVERSITY, BERLIN
STEINBEIS-TRANSFER-INSTITUTE
INTELLECTUAL PROPERTY MANAGEMENT

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National Seminar on IP Asset Valuation for Technology Transfer

Case Study

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Initial Situation

- A research institute has developed innovative liquid carrier solutions (so-called solubilisates). These solubilisates can encapsulate a variety of active raw materials and active substances in an ultrafine micelle structure.
- These solubilisates can transport bioactive substances like:
  - Vitamins
  - Omega-3 fatty acid
  - Isoflavones, flavonoids, carotenoids
  - Phyto extracts
  - Essential oils
  - Preserving agents
- For this reason the solubilisates allow for the development of highly efficient innovative dietary supplements and functional foods or drinks.
- The efficiency has been tested in a clinical study.
- All certificates for the implementation to dietary supplements and functional foods or drinks are available.

Patent Portfolio

The technology is protected by a portfolio of 6 patent families:

P1 **WATER-FREE UBICHINON CONCENTRATE**
DExxx B4
Priority date: July 12, 2008

FI CAxxx A1, CNxxx A, EPxxx A1, JPxxx T, MXPxxx A, RUxxx C2, USxxx B2, WOxxx A1

P2 **Water-soluble concentrates of xxx**
DExxx B4
Priority date: February 01, 2008

FI US xxx A1, CA xxx A1

P3 **FABRICATION OF MICROSTRUCTURED FIBRES**
WOxxx A2
Priority date: March 09, 2007

FI AT xxx T, AU xxx A1, CA xxx A1, DE xxx D1, EP xxx B1, GB xxx B, HK xxx A1, IL xxx D0, JP xxx T, MXP xxx A, US xxx B2, US xxx B2, US xxx A1, WO xxx A1

P4 **Water-soluble concentrates**
DExxx B4
Priority date: September 05, 2006

FI AT xxxT, AU xxx A1, CA xxx A1, DE xxx A1, DE xxx B4, DE xxx D1, EP xxx A2, EP xxx B1, EP xxx A3, JP xxx T, JP xxx A, MXP xxx A, US xxx A1, WO xxx A3

P5 **Aqueous solution of ascorbic acid**
DE xxx B4
Priority date: June 18, 2003

FI AU xxx A1, BR xxx A, CA xxx A1, CN xxx A, EP xxx A1, EP xxx A3, JP xxx A, MXP xxx A, RU xxx C2, US xxx B2, US xxx A1

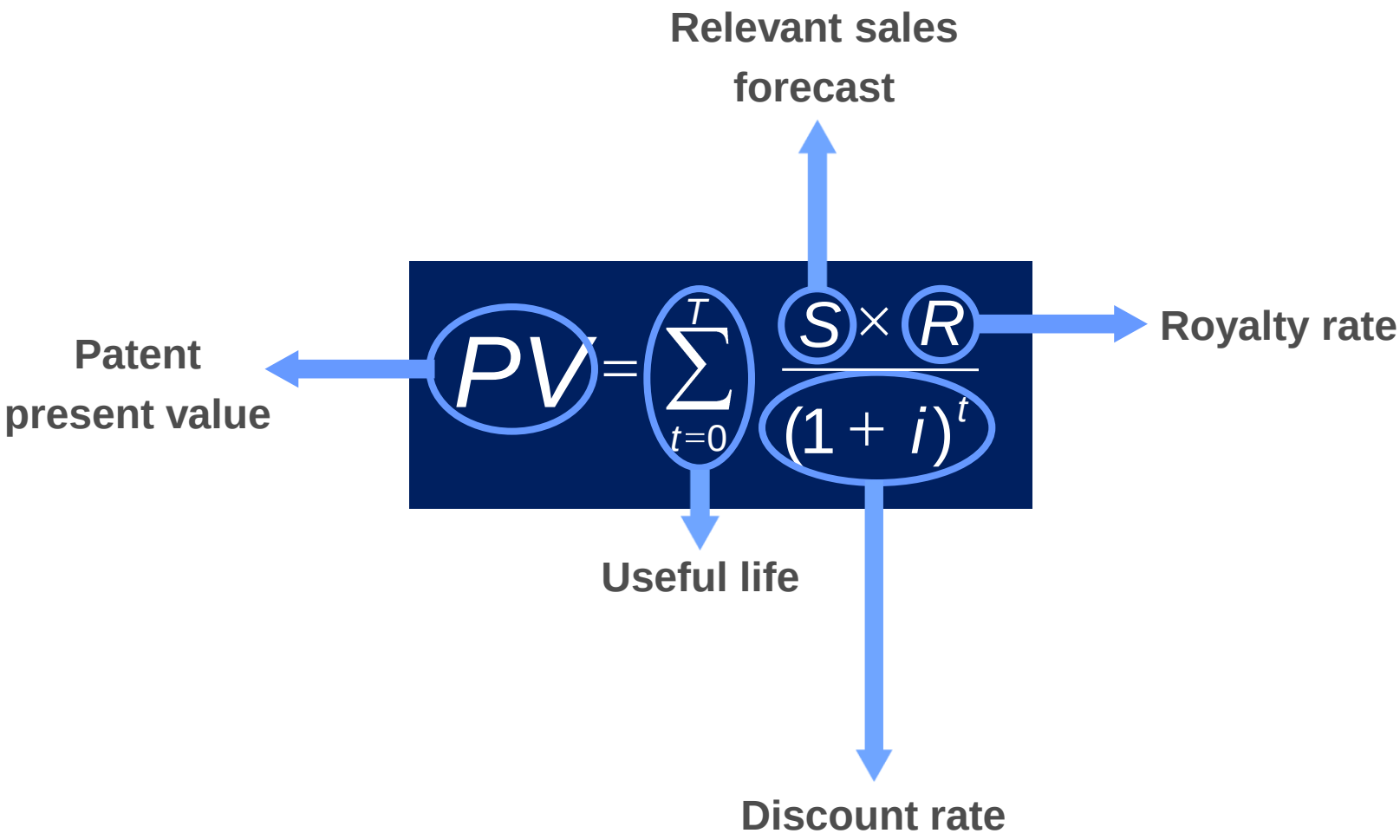
P6 **Water-free solubilizate of a preservative**
DExxx A1
Priority date: October 01, 2002

FI WO xxx A1

Initial Situation

- The research institute's Technology Transfer Center has been commissioned to market the technology and sell or license the portfolio.
- The person responsible for the project contacted a large US manufacturer of soft drinks.
- This manufacturer is highly delighted about the offer, because corporate strategy stipulates, that the strongly growing and highly profitable market for functional drinks should be entered within the next two years.
- The technical solutions for the transportation of bioactive substances the company developed so far show much fewer efficiency.
- Before negotiations about licensing or the purchase of the portfolio begin the company asks for providing a preliminary pricing expectation.

Application of the Relief from Royalty Method



Valuation Scenario

Basic questions for setting up a valuation scenario:

- **How will the potential buyer exploit the patents? E. g.:**
  - New product
  - New feature / attribute to existing products
  - Enhanced production process
  - Avoidance of purchase by a third party to protect the market share of an existing product
- **Which effect would the ownership of the patents provide to the potential buyer? E. g.:**
  - Technological leadership
  - Shortened time to market
  - Unique selling position
- **How will the potential buyer earn money from implementing the patent protected technology? E. g.:**
  - Product sales
  - Enabling new services
  - Access to further technologies by cross licensing

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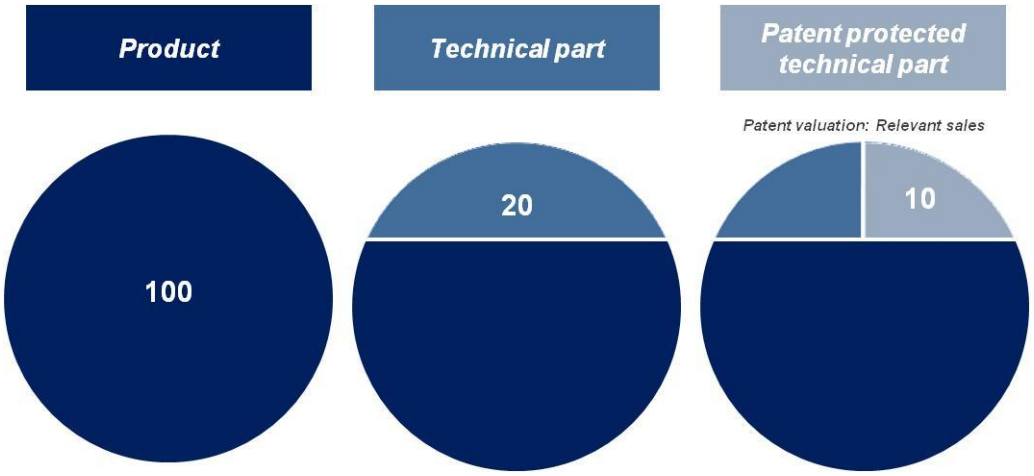
Valuation Scenario

- By intense search for market studies on the functional food market and by analysis of the data retrieved the following key numbers have been revealed:
  - The global functional drinks market is strongly growing. Market experts predict an average annual growth of approx. 15% in sales for the forthcoming 5 years.
  - The actual global market for functional drinks is estimated to be approx. 1.500$ Mn.
  - The US market is the most important market and accounts for approx. 30% of the global market.
- Further research company specific information on the potential buyer shows the following results:
  - The company's home market is the US. All products are first launched in the US. After a testing period of approx. 2 years the products are rolled out globally.
  - The company has a market share in the US soft drinks market of approx. 20% and in the global market of approx. 10%.
  - In its annual report the company has published average Capital costs (WACC) of 8.7% and an average tax rate of 18.5%.

Sales Forecast

All figures in $ Million	2010	2011	2012	2013	2014	2015	2016	2017	2018
Global market development									
Global sales functional driks	1.500	1.725	1.984	2.281	2.624	3.017	3.168	3.326	3.493
Growth rate		15%	15%	15%	15%	15%	5%	5%	5%
US market development									
US sales functional driks	450	518	595	684	787	905	950	998	1.048
In % of global market	0,3	30%	30%	30%	30%	30%	30%	30%	30%
Global market excluding the US	1.050	1.208	1.389	1.597	1.836	2.112	2.218	2.328	2.445
Development of company sales									
Estimated market share US	0	0%	5%	10%	20%	20%	20%	20%	20%
Sales US	0	0	30	68	157	181	190	200	210
Estimated market share rest of world	0	0%	0%	0%	2%	5%	10%	10%	10%
Sales rest of world	0	0	0	0	37	106	222	233	244
Estimated sales	**0**	**0**	**30**	**68**	**194**	**287**	**412**	**432**	**454**

Detection of relevant sales



Actual case:

- The technology is considered to be implemented to innovative functional drinks.
- The sales forecast concentrates on functional drinks.

  ⇒ The product relevant sales are 100%.
- The functional drinks allow for a price premium of approx. 100% compared to conventional soft drinks.

  ⇒ The technical part is assessed to be 50%.
- Besides the carrier substance the bioactive substances themselves are to be considered.

  ⇒ Due to the fact that many of them are known for a long time and that their efficiency is determined by the quality of the solubilisates the protected part covered by the portfolio on hand is assessed to be 60% of the technical part.

⇒ **The portfolio relevant share of sales can be assessed to be approx. 30% of the sales forecast.**

Assessment of useful life

Factors to consider (e. g.)

Maitenance	*The maximum useful life is determined by the duration of maintenance of a patent. The average for this amounts to 8 years.*
Duration of usage	*The duration of usage of a patent is usually shorter than the duration of maintenance. On average patents are used for 3 to 5 years.*
Product life cycle	*If the duration of usage is not clear product life cycles can be used to receive an approximation.*
Technology life cycle	*If product life cycles do not seem appropriate technology life cycles can be used for the assessment of useful life.*

Actual case:

- The technology protected by the patents to be valued is at a very early stage.
- The patents do have an average maximum remaining life of 16 years.
- Product life cycles in the target industries are far above average at approx. 8 years.

⇒ **The patents' useful life for the potential buyer can be assessed to be approx. 8 years.**

Modeling of royalty rates

- Royalty rates retrieved from databases / literature result from concrete licensing negotiations in the past.
- They can only be transferred to other valuation objects if a comparable transaction situation is given.
- IP-rights are unique. Therefore a comparable transaction situation could not be assumed.

⇒ **Royalty rates have to be modeled!**

Actual case:
Despite intensive search in royalty databases and literature no royalty rates for the licensing of solubilisate patents could be identified. The following royalty rates that describe licensing policies in the target industries were found:

- Foods 2-4%
- Medical Products 1%
- Drug Delivery – Controlled Release 3.33%
- Personal Care – Bioadhesive Delivery System 2%
- Medical Products 4%
- Preservatives 3.25%

⇒ **As a starting point a basic royalty rate of 3% can be assumed.**

Modeling of royalty rates

Royalty rates can be modeled by using value factors such as:

Portfolio related value factors	***Technical value factors***	***Competition related value factors***
• Coherence of the portfolio • Circumvention potential • Citations • Product- / process correlation • Etc...	• Technology lifecycle • Technological competencies • Technological relevancy • Standard relevancy • Etc...	• Coverage of protected attributes in technological competitors' portfolios • Intenseness of technological competition • Number of technological competitors • Etc...

Modeling of royalty rates

Rating table:

Bypassing Potential	Valuation Factor
No bypassing possible	1,4 1,3
Bypassing makes no technical sense	1,2 1,1
Bypassing solution more complex	1,0
Bypassing of individual characteristics possible	0,9 0,8
Bypassing possible	0,7 0,6

Rating table:

Portfolio Integration	Valuation Factor
Very highly integrated portfolio structure	1,4 1,3
Highly integrated portfolio structure	1,2 1,1
Stand-alone technology area	1,0
Unstructured portfolio	0,9 0,8
Very unstructured portfolio	0,7 0,6

Rating table:

Competitors' coverage of specific features	Valuation Factor
No / hardly any competitor's portfolio covers the attributes	1,4 1,3
Coverage of attributes in few competitors' portfolios	1,2 1,1
Coverage of attributes in some competitors' portfolios	1,0
Coverage of attributes in many competitors' portfolios	0,9 0,8
Tight coverage of attributes in all competitors' portfolios	0,7 0,6

Rating table:

Enforceability	Valuation Factor
Easy acquisition of infringing product (mass produced)	1,4 1,3
Acquisition of infringing product feasible	1,2 1,1
Minor process portion involved in infringing product	1,0
Infringement by product and process	0,9 0,8
Infringement by process	0,7 0,6

Rating table:

Customer perception (USP)	Valuation Factor
Technical solution is the most important reason for buying	1,4 1,3
Technical solution provides an important unique selling proposition	1,2 1,1
Technical solution provides an unique selling proposition, is percepted by the customer	1,0
Technical solution does not provide any advantageous unique selling proposition	0,9 0,8
Technical solution has no customer benefit / is not noticeable for the costumer	0,7 0,6

Rating table:

Technology pitch	Valuation Factor
All patented products and processes implemented	1,4 1,3
Most patented products and processes implemented	1,2 1,1
Patented products and processes partly implemented	1,0
Few patented products and processes implemented / usage of technology planned	0,9 0,8
Feasibility not yet clear	0,7 0,6

$$VF_{Total} = VF_1 \times VF_2 \times VF_3 \times VF_4 \times VF_5 \times VF_6 = 1{,}22$$

Actual case:

⇒ **The royalty rate could be adjusted to the actual case by using a multiplier of 1,22.**

⇒ **A reasonable royalty rate of 3,7% is detected for the actual situation.**

Legal Risk Assessment

Factors to consider (e. g.)	
Status	*Is the patent in force? In which countries is it in force? Have examination requests been filed in time? etc.*
Ownership / contractual issues	*Are there any contractual issues that restrict the intended usage? etc.*
Patententability / invalidity	*Has the patent been granted? If not, is the invention patentable? Is there any opposition filed? etc.*
Freedom to operate	*Does a third party hold a patent which is infringed by the technology described in the patent in question? Is the patent to be valuated dependent on any third party's patent? etc.*
Scope of claims	*Does the patent really cover the product or process that it is meant to cover?*
Detectability of infringement	*Can infringement of the patent be detected?*

Source: Köllner Malte (2009): Due Diligence or Discount Monetary Effect Of Legal Aspects In Patent Valuation, les Nouvelles, March 2009.

<u>Actual case</u>:

⇒ **An analysis of the patent portfolio led to a reasonable discount for legal risks of 22%.**

Assessment of the Discount Rate

$$PV = \sum_{t}^{T} \frac{E_t - C_t}{(1 + i + z_t)^t} \qquad E_t = S_t \cdot VA \cdot R_B \cdot \lambda_i \cdot \lambda_d$$

PV: Patent value,
t: Time period until end of usage [T],
E: IP related income,
C: IP related spending
i: Risk free interest
z: Risk premium

S_t: Sales of related product/process as underlying
VA: Value-added factor of the protected aspect of the entire product, reference
R_B: Basic royalty rate
λ_i: Royalty increasing factors
λ_d: Royalty decreasing factors

With $\lambda_i \times \lambda_d$ as the product of the single value influencing factors

Example Discounted Cash-Flow

Patent Value PV = $\sum(E_t)\cdot(1+r)^{-t}$, Discount rate r = i+z

Risk free interest [i] = 3,5%; risk premium [z] = 12% ⇒ r = 15,5

Income:	5.000	22.500	64.000	89.500	81.000
Costs:	45.500	3.750	1.800	1.750	1.000
	E_0: -40.500	E_1: 18.750	E_2: 62.200	E_3: 87.750	E_4: 80.000
Valuation date		1	2	3	4 (Exploitation-Time scale [t])
	-40.500	16.233	46.625	56.950	44.953
$PV_{r=15,5}$	124.261				
$PV_{r=7,5}$	161.303	17.441	53.823	70.635	59.904

Technological market development	Valuation factor
Strongly emerging market	1.0 0.9
Emerging market	0.8 0.7
Stagnating market	0.6
Decreasing market	0.5 0.4
Strongly decreasing market	0.3 0.2

Number of competing patent applicants	Valuation factor
≤ 2	1.0 0.9
3 - 4	0.8 0.7
5 - 8	0.6
9 - 15	0.5 0.4
> 15	0.3 0.2

Actual case:

- **For assessing an applicable discount rate the company's WACC of 8.7% should be adjusted by using a project specific risk factor.**
- **Due to the company's great market experience a risk factor of 5% is chosen**

⇒ **The discount rate is assessed to be 13.7%.**

Value Calculation

All figures in $ Million		2010	2011	2012	2013	2014	2015	2016	2017	2018	
Development of company sales											
Estimated sales		**0**	**0**	**30**	**68**	**194**	**287**	**412**	**432**	**454**	
Detection of relevant sales											
Patent relevant sales	RS= 30%	0	0	9	21	58	86	124	130	136	
Application of royalty rate											
Hypothetical royalty rate	RR= 3,7%	0	0	0	1	2	3	5	5	5	
Application of legal risks											
Hypothetical royalty rate after legal risk application	LR= 78%	0	0	0	1	2	2	4	4	4	
Application of taxes											
Hypothetical royalty rate after legal risk and tax application	TR= 18,5%	0	0	0	0	1	2	3	3	3	
Dicounting											
Net present value	**WACC= 13,7%**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**6**

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