Software Products

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COSS B02

Agenda

1. Software as a product
2. Intellectual property
3. Core product
4. Basic product
5. Whole product
6. Product architecture
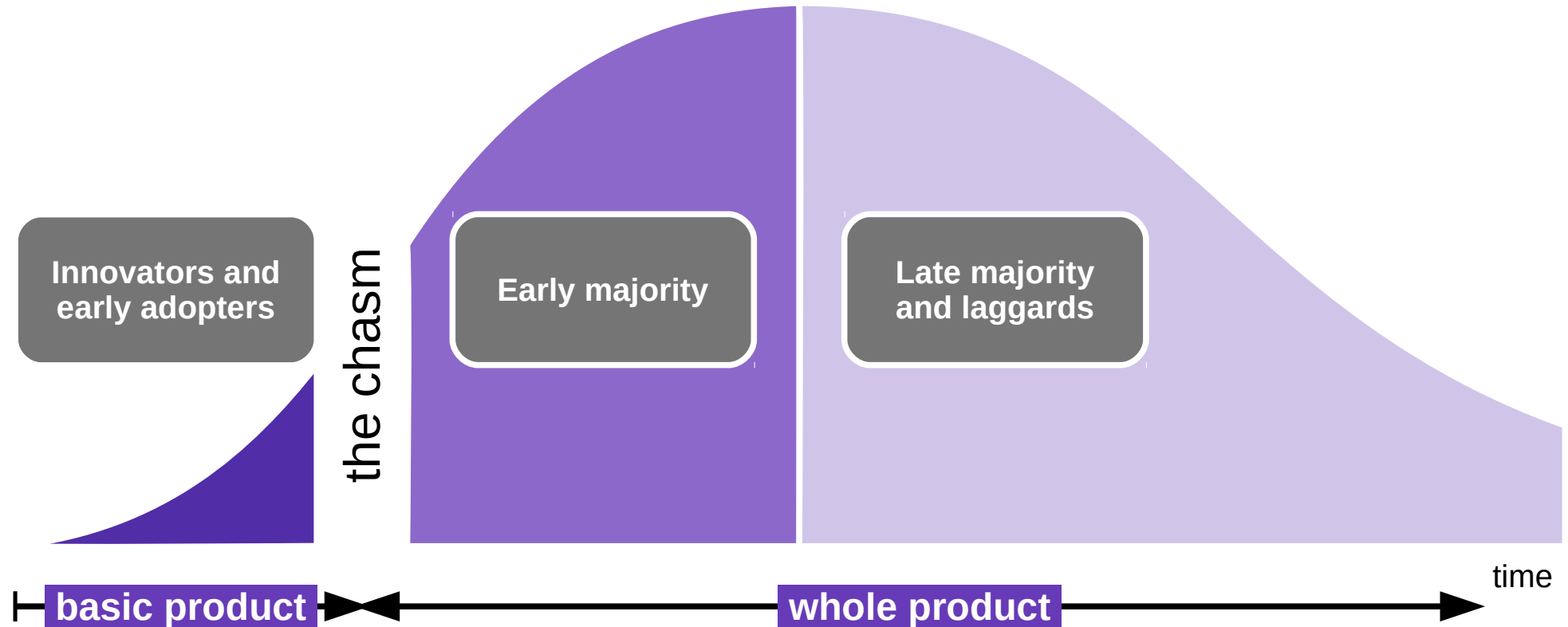7. Product life-cycle

1. Software as a Product

Software Products (Recap)

- A **software product**
  - Is a digital good (software, intellectual property)
  - Is non-physical, does not rot
  - Has near-zero copying costs
  - Is a man-made artifact sold to customers in a market
  - Has a life-cycle (is born, grows and matures, eventually dies)
  - Is both extremely malleable and hard to change

Core, Basic, and Whole Product

- **Core product** =
    - Core software + additional functions
    - Complementary artifacts
    - Self-help services

- **Basic product** = core product +
    - Fitness for use / certification
    - Indemnification
    - Support services

- **Whole product** = basic product +
    - Training
    - Consulting
    - Operations

Innovators and early adopters

the chasm

Early majority

Late majority and laggards

time

basic product

whole product

Whole product

Basic product

Core product (intellectual property)

Software
- Core software
- Additional software (extensions + plug-ins, tools and utilities, integrations)

Complementary materials
- Documentation
- Training materials

Self-help services
- Forums, mailing lists
- Help and chat agents
- On-line tutorials

Pricing of usage rights
- Quantity: User, machine, time, …
- Duration: Perpetual, time-limited, …
- Structured: Initial license fee, regular subscription fee

Guarantees ("insurance")
- Fitness for use, certification
- Indemnification

Pricing of guarantees
- By damage: Loss of business, fines received
- Structured: Levels / bands, formula

Support services
- Hot-line support
- On-site servicing

Pricing of support services (SLAs)
- By availability: Incident-based, 9x5, 24x7
- By quality: First-level, second-level, third-level

Training
- In-house training
- Off-site training

Pricing of training
- Fixed fee
- Per participating person

Consulting
- Technical implementation services
- Strategic solution consulting

Pricing of consulting
- Fixed fee
- Time and materials

Operations
- Provision of SaaS (managed service)

Pricing of operations
- Quantity: Users, resources, …
- Duration: Always time-limited
- Structured: Set-up, subscription

2. Intellectual Property

Intellectual Property (IP)

- Property
    - Is some tangible or intangible entity
    - Has an owner who has legal title to the property

- Intellectual property is property that is
    - Conceptual, i.e. non-tangible and usually non-fungible
    - Unique, i.e. not-a-commodity, not-interchangeable

- Intellectual property rights are **exclusion rights**
    - The owner has the right to exclude others from use

Three Types of Intellectual Property

1. Copyright
2. Patent rights
3. Trademark rights

Copyright

- Copyright is a right to intellectual property
  - **For a specific expression, initially given to creator of work**
  - To exclude anyone from presentation, reproduction, modification
  - It will eventually expire and the work will enter the public domain

- Copyright law varies by jurisdiction
  - Under U.S. law, can be signed over to third person
  - Under German law (Urheberrecht) only usage rights can be granted
  - Interpretation of one law in another jurisdiction is questionable

- In software, examples of works that can be copyrighted are
  - User interface designs
  - Database schemata
  - Source code

- A patent right is a right to intellectual property
    - **For a non-obvious industrial invention**
    - To exclude anyone from using the invention
    - It will eventually expire; invention will enter the public domain

- Patent right goal is foster innovation by motivating disclosure

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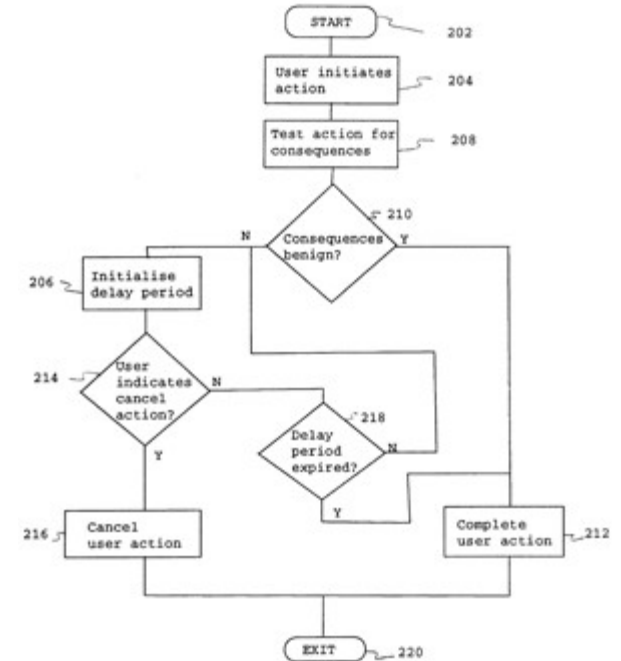
Trademark Rights

- Trademark rights are a right to intellectual property
  - **For a distinctive textual or visual sign, smell, sound**
  - To exclude anyone from using the sign, smell, sound
  - They never expire, if registered and enforced ("use it or lose it")

Identify the Intellectual Property

FLUSH-FRONT BEZEL

LIGHT SENSOR TO AUTOMATICALLY ADJUST BRIGHTNESS TO YOUR ENVIRONMENT

300 PPI DISPLAY FOR LASER-QUALITY TEXT

PRESSURE-BASED PAGE TURN SENSORS WITH HAPTIC FEEDBACK

ULTRATHIN DESIGN (7.6 MM)

MICRO-ETCHED GLASS TO ELIMINATE GLARE

BUILT-IN LIGHT SHINES ON THE PAGE, NOT IN YOUR EYES

CONCEALED MAGNET FOR SECURE COVER ATTACHMENT

STRONG & LIGHT MAGNESIUM ENCLOSURE

Exclusion Rights in Comparison

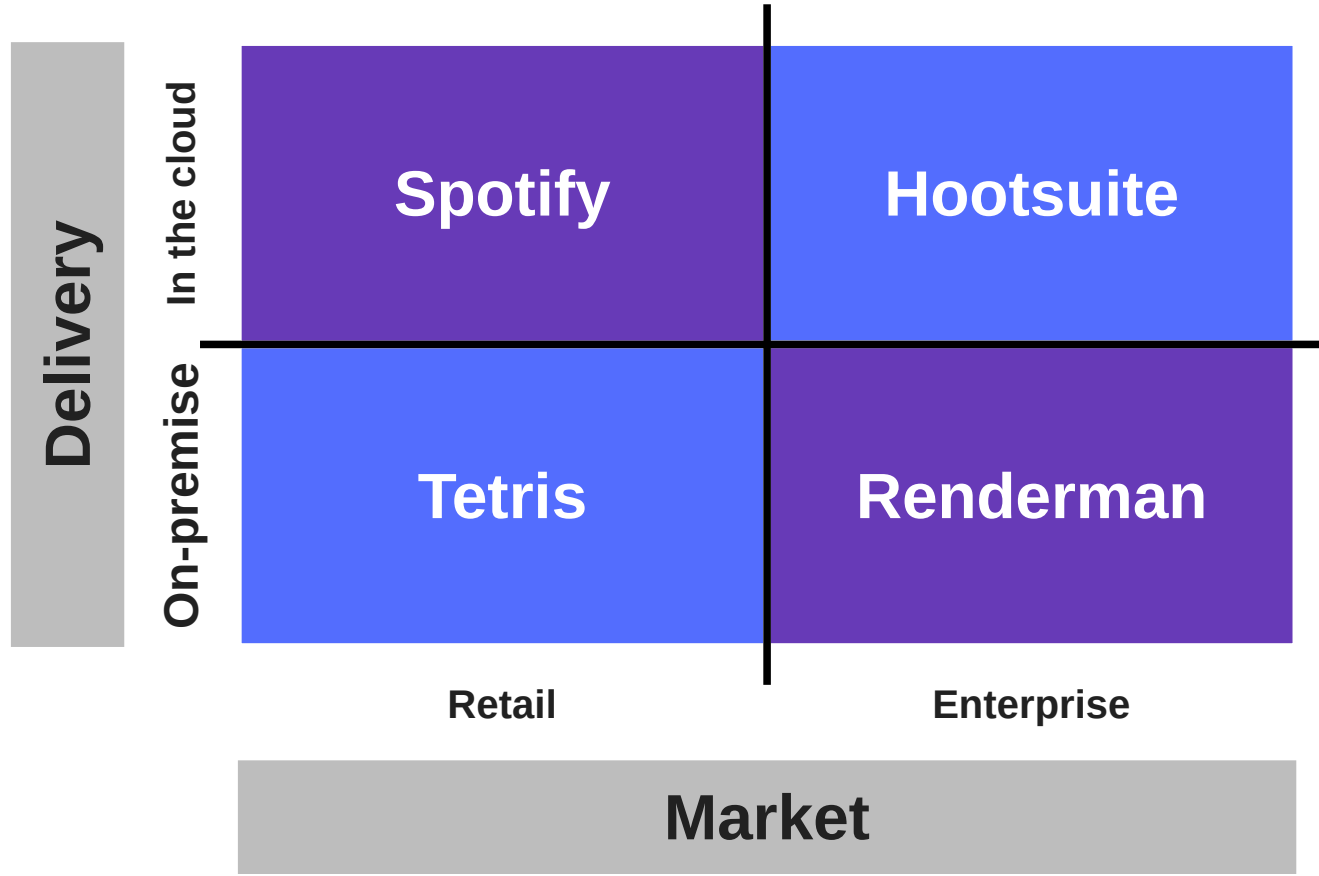|	Copyright	Patents	Trademarks
Form	Text, other specific expressions of non-trivial complexity	Abstract idea that represents a non-trivial industrial invention	Equivalence set of uniquely identifiable expressions
Purpose	To promote otherwise unprotectable artistic expression by protecting it	To spur innovation by motivating the disclosure of trade secrets	To protect consumers from confusion by providing unique marks
Duration	Will eventually expire, but only after several decades	Will eventually expire, but only after a few decades (shorter than copyright)	Will not expire as long as it is enforced by trademark owner
Granting	Automatic by creation	By application to patent office	By application to trademark authority

3. Core Product

Core Product

- **Core product** =
  - **Core software + additional functions**
  - **Complementary artifacts**
  - **Self-help services**

- Basic product = core product +
  - Fitness for use / certification
  - Indemnification
  - Support services

- Whole product = basic product +
  - Training
  - Consulting
  - Operations

License

- A license is a rights grant (a contract in most jurisdictions)
  - Between a licensor and a licensee that
    - Lets the licensee do specified things with
    - Some tangible or intangible property

  - Is only valid if the licensor can actually grant these rights

- The rights grant may
  - Allow use, modification, reproduction, ...
  - Be perpetual, irrevocable, worldwide, …

- The most common license type is the EULA
  - EULA = End-user License Agreement

Software License

- A software license is a license that
  - Defines a rights grant to some piece of software
  - Is typically based on copyright, trademarks, and patents

Four Example Products

Delivery

In the cloud | On-premise

	Retail	Enterprise
In the cloud	Spotify	Hootsuite
On-premise	Tetris	Renderman

Market

Software (Core Product 1 / 3)

- Core software

- Additional functions
  - Extensions and plug-ins
  - Tools and utilities
  - Integrations with other software

Spotify	Hootsuite
Tetris	Renderman

- Documentation
- Training materials

- Forums and mailing lists
- Chat and help agents
- On-line training

Spotify	Hootsuite
Tetris	Renderman

Pricing of Core Product

- By consumption
  - Number of users
  - Number of cores / processors / machines
  - Amount of time consumed

- By availability
  - Perpetual
  - Time-limited (e.g. one year)
  - Only on Halloween at 6:66am

- Structured as
  - Initial license fee
  - Regular subscription fee
  - Prepaid, postpaid, some other time

Spotify	Hootsuite
Tetris	Renderman

4. Basic Product

Basic Product

- Core product =
  - Core software + additional functions
  - Complementary artifacts
  - Self-help services

- **Basic product** = core product +
  - **Fitness for use / certification**
  - **Indemnification**
  - **Support services**

- Whole product = basic product +
  - Training
  - Consulting
  - Operations

- Fitness for use is the fitness of the product for described uses
  - In case of unfitness, vendor typically has (right) to fix problem
  - Provides bug fixes within defined time

- In case of continued unfitness (problem can't be fixed)
  - Vendor may have to compensate loss of business
  - Pay a defined penalty

- Pricing of fitness for use
  - In levels or bands or using a formula
  - Dependent on severity of violation

Spotify	Hootsuite
Tetris	Renderman

The Meaning of "Maintenance"

- Maintenance (the more traditional term for "subscription")
  - Is the provision of bug fixes to customers
  - Pro-actively or in response to bug reports

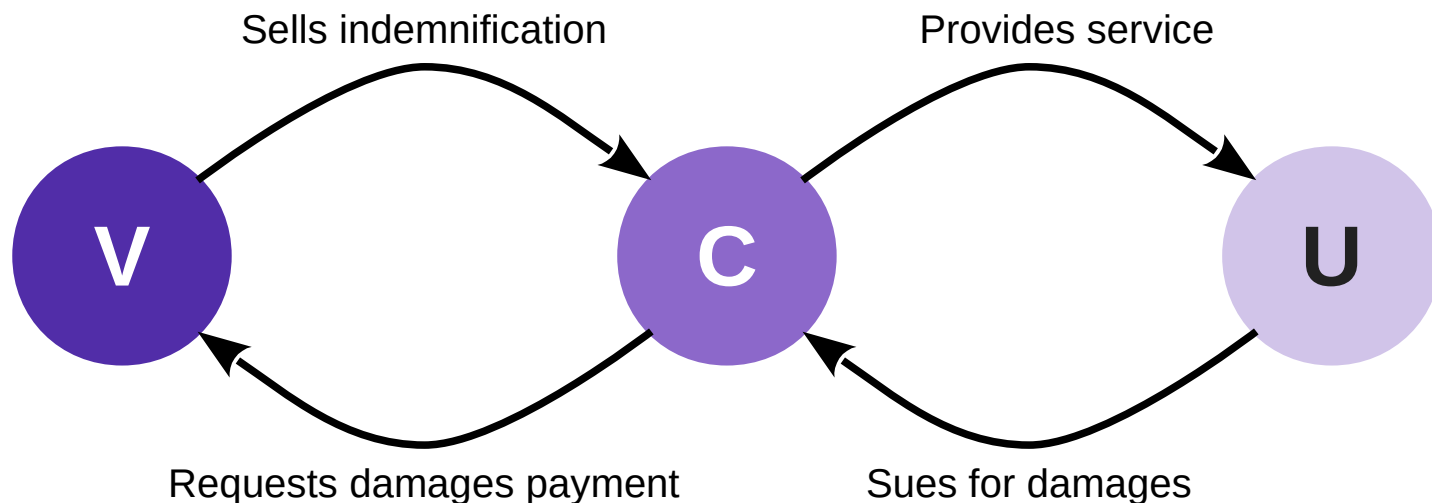- Legally speaking, vendors are making good on "fitness for use"

- Certification is a guarantee of a specifically defined fitness for use
  - Hardware
  - Software

- Is provided by a
  - Certification agency
  - Complementary product vendor

- Is often a purchase requirement

Spotify	Hootsuite
Tetris	Renderman

- Indemnification [1] is an insurance to have damages covered

Spotify	Hootsuite
Tetris	Renderman

Sells indemnification   Provides service

V   **C**   **U**

Requests damages payment   Sues for damages

- Pricing of indemnification is priced like fitness for use

[1]   German: "Schadensfreistellung"

Support Services (Basic Product 4 / 4)

- Support services
  - In-person / on-site
  - Hotline (voice)
  - E-mail
  - Chat
  - Forums

- Pricing can be by
  - Channel
  - Consumption
  - Availability (9x5, 24x7)
  - Quality (first, second, third-level support)

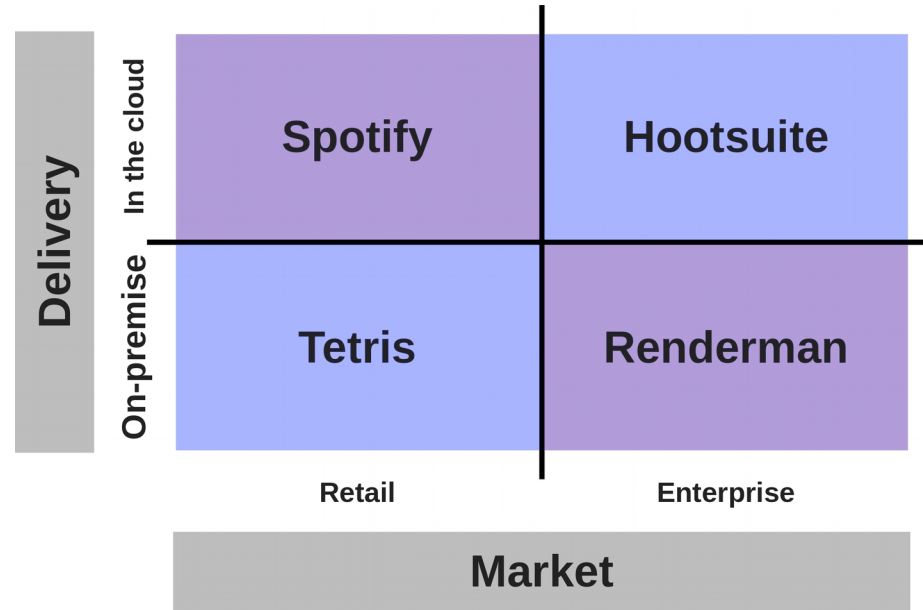|	
Spotify	Hootsuite
Tetris	Renderman

5. Whole Product

Whole Product

- Core product =
  - Core software + additional functions
  - Complementary artifacts
  - Self-help services

- Basic product = core product +
  - Fitness for use / certification
  - Indemnification
  - Support services

- **Whole product** = basic product +
  - **Training**
  - **Consulting**
  - **Operations**

"Some people spend time to save money, some spend money to save time." [M10]

Training (Whole Product 1 / 3)

- There are two variants of training
  - In-house training
    - Vendor holds training at customer location

  - Off-site training
    - Users attend training at vendor location

- Pricing of training
  - Fixed fee
  - Per person
  - By volume

Spotify	Hootsuite
Tetris	Renderman

Consulting (Whole Product 2 / 3)

- Consulting is the provision of
  - Technical implementation services
  - Strategic solution consulting

- Pricing of consulting is by
  - Fixed fee
  - Time and materials

Spotify	Hootsuite
Tetris	Renderman

- Operations is the provision of (the) software-as-a-service

- Pricing is similar to usage rights
  - By consumption
    - User, resources, time, …

  - Structured as
    - Set-up free, subscription fee

  - Duration
    - Limited in time, life-time subscription

Spotify	Hootsuite
Tetris	Renderman

6. Product Architecture

- Products consist of components
    - Software components
    - Hardware components

- Components embed various forms of intellectual property
    - Open source software (copyright)
    - Algorithms (patents)
    - Implied trust (trademarks)

- Products need to conform with legal and de-facto standards
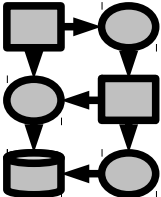   - Implies more licenses to other people's IP is needed

- Who owns what?
  - What third-party components do you need?

- How to license it?
  - At what cost?

- How will it change in the future?
  - Will there be alternatives?

- Is it FRAND [1]? Is it open (source)?
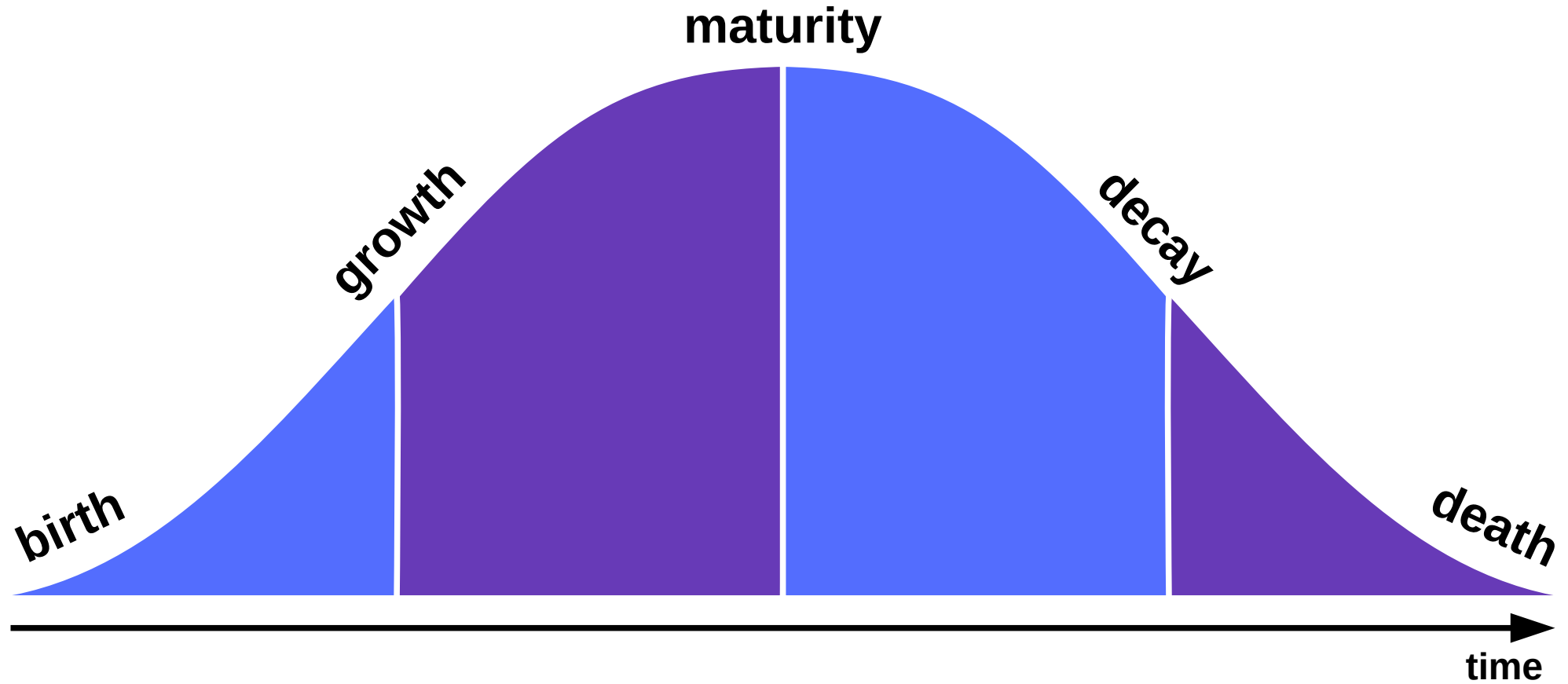
[1]   FRAND = "Fair, reasonable, and non-discriminatory"

An Example IP-View of a Product Architecture

Component	Type	Owner	Rights sold
	Physical parts	Vendor	Ownership
	Source code	Vendor	Usage rights
	MP3 patent	Fraunhofer IIS	Usage rights

7. Product Life-Cycle

Basic Life-cycle Model of Products

maturity

growth

decay

birth

death

time

Advanced Topics

- Product bundling
- Complementarity
- Partnerships

Summary

1. Software as a product
2. Intellectual property
3. Core product
4. Basic product
5. Whole product
6. Product architecture
7. Product life-cycle

Thank you! Questions?

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- Contributions
    - None yet