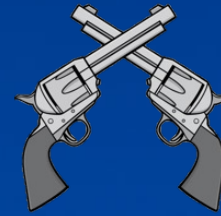




# *A Wild West Story*

*by Magnus Rotvit Perlt Hansen*



Roskilde  
Universitet

## This is not a seminar about VR

Just some thoughts on how we can improve  
designing for contemporary technology

Gothenburg, University West, 10/10 2019



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Associate Professor @ Roskilde University  
Institute of People and Technology  
Informatics

Researching:

- Design and Diffusion of Sustainable, Green IT
- Project Management Complexity through rules
- Through **Design Science Research**



# Today's message

How to create navigable product innovation  
**through establishment of *genres* of technological rules**

*Or in less academic terms:*

”How to make future Wild West scenarios more civilized?”

# Today's "Journey"

VR as an example

A theoretical hot potato

Genres as a means

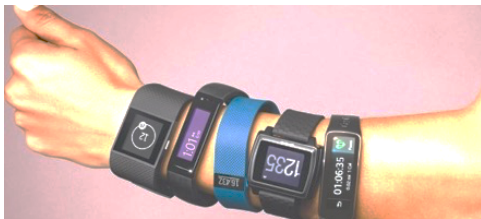
1. The Wild, Wild West of Contemporary Technology Evolution
2. Technological Rules
3. What does it all mean?

# The Wild West of Contemporary Technology

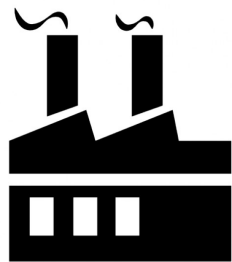
- Total anarchy
- Few technology leaders
- Huge competition

However:

- Individuals know and desire the technology much more rapidly than previously
- Formal bodies are struggling to adopt, adapt and improve



# Historical Diffusion

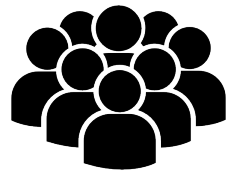


Innovator

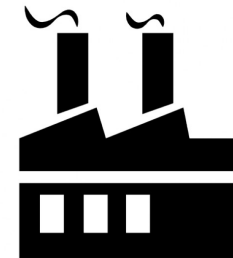


Adopter

# Diffusion now

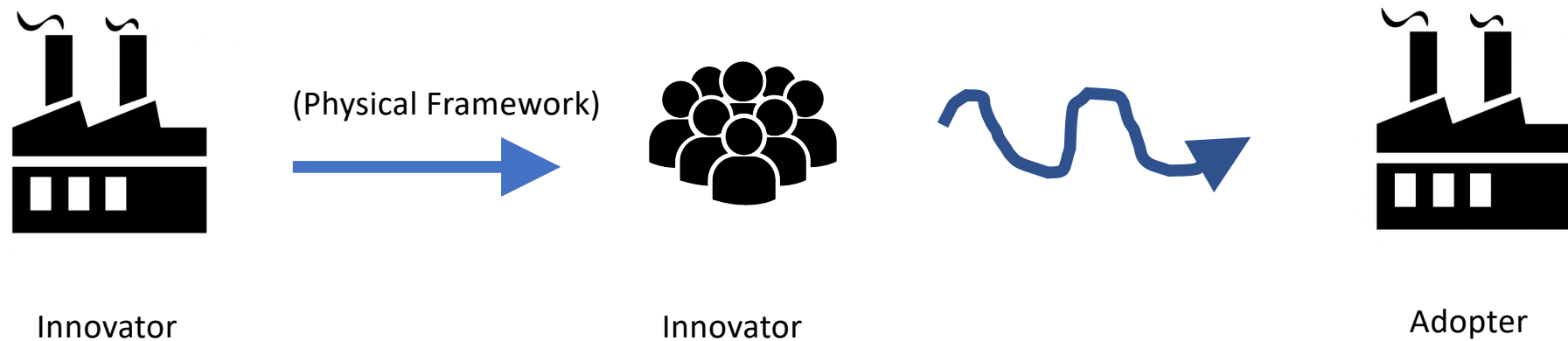


Innovator



Adopter

# Diffusion now – even more precise



*(Chesbrough 2003)*



# An example

- Virtual Reality hardware and software is coming of age



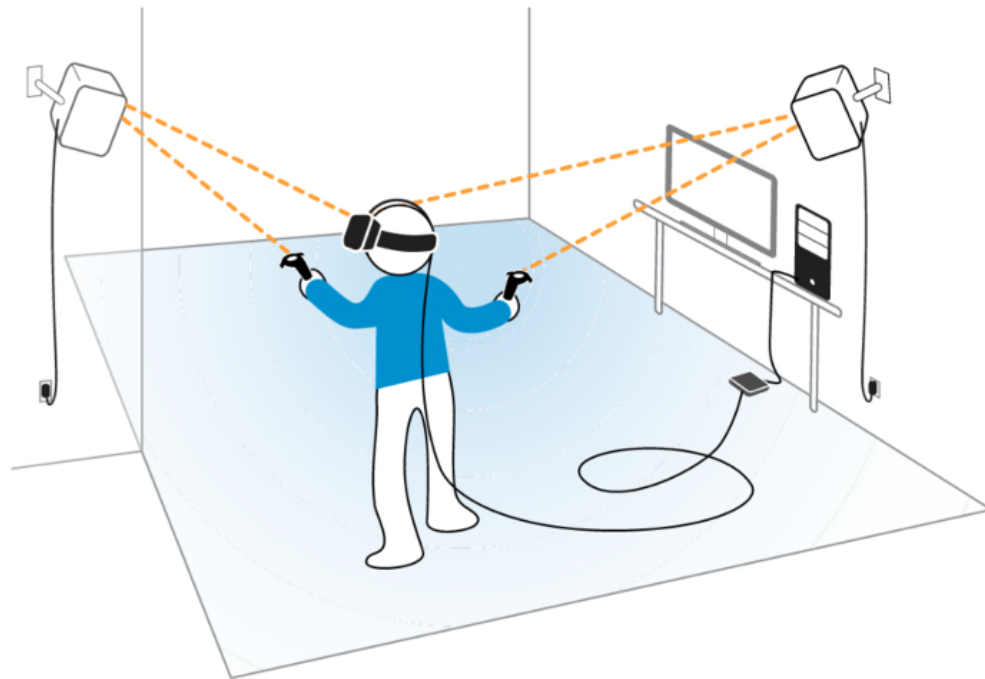
# Basic virtual reality

- Sitting
- Passive
- Little influence and/or agency



# Roomscale virtual reality

- Embodied
- Interactive
- Opportunity for exploration





- But what age are we coming to?



# Why is it a problem?

Rapid diffusion and evolution of technology

Project failure high

New markets and areas

Maturity for design, development and evaluation need to follow

We need a set of rules to design from



(Fantastic)

...And where to find them

# Technological Rules

# Bunge, M. (1967)

- Rules of conduct
- Rules of prescientific work
- Rules of sign
- Rules of science and technology

*(Bunge 1967)*

# Rules

- Are prescriptive norms
- Are grounded if based on a set *law formulas*
- Hold *no truth value*
- Can only be judged by their *effectiveness*

(Bunge 1967)



## **Example**

- If you meet a woman, take off your hat to show respect

## Example

If you want a technology adopted fast, identify and communicate an innovation to the opinion leaders of a social system

("Law" is Rogers' (2003) *Diffusion of Innovations*)

- Practitioners adopt rules but often without knowing *why*
- Researchers *judge* rules in order to understand the underlying *laws* of the rule
- ... and in order to *improve* or *replace* the rule

(Bunge 1967)

# So what?

Well...

The Wild West has very few technological  
rules explicitly grounded in laws

*(Schjerlund et al. 2018)*

# Technological Rules = Design Principles

# Example of a study

- **A roomscale VR experiment in three dimensions** - Schjerlund (2018)

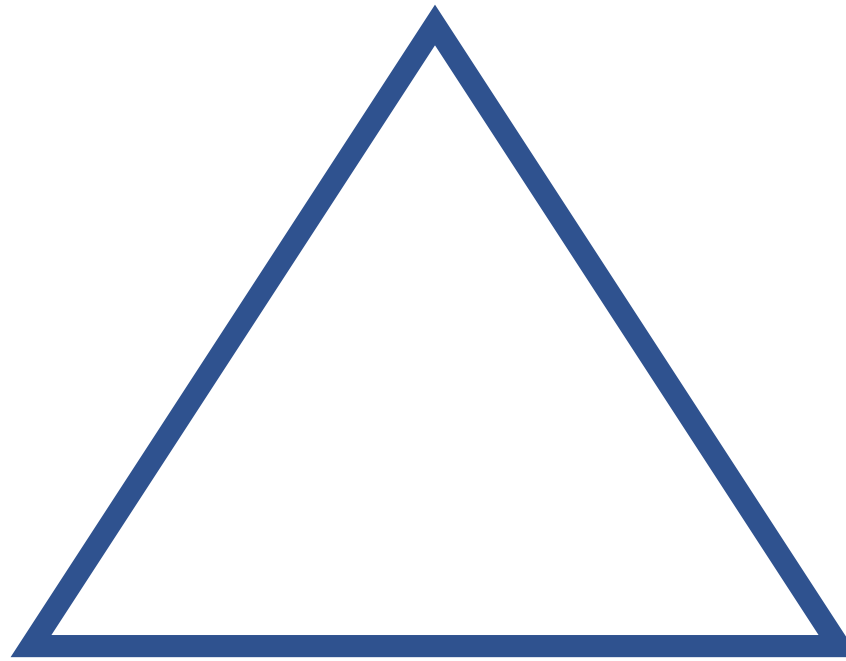
*“What are central design dimensions and design principles for room-scale virtual reality that can be used to design engaging virtual reality experiences?”*

*(Schjerlund et al. 2018)*



Spatiality: depth – WHERE?

Interaction:  
Integration –  
WHAT AND HOW



Narrative:  
Richness - WHY

# Spatiality - where

- Proximity
- Density
- Radial representation
- World space vs interaction space

# Interaction – what and how

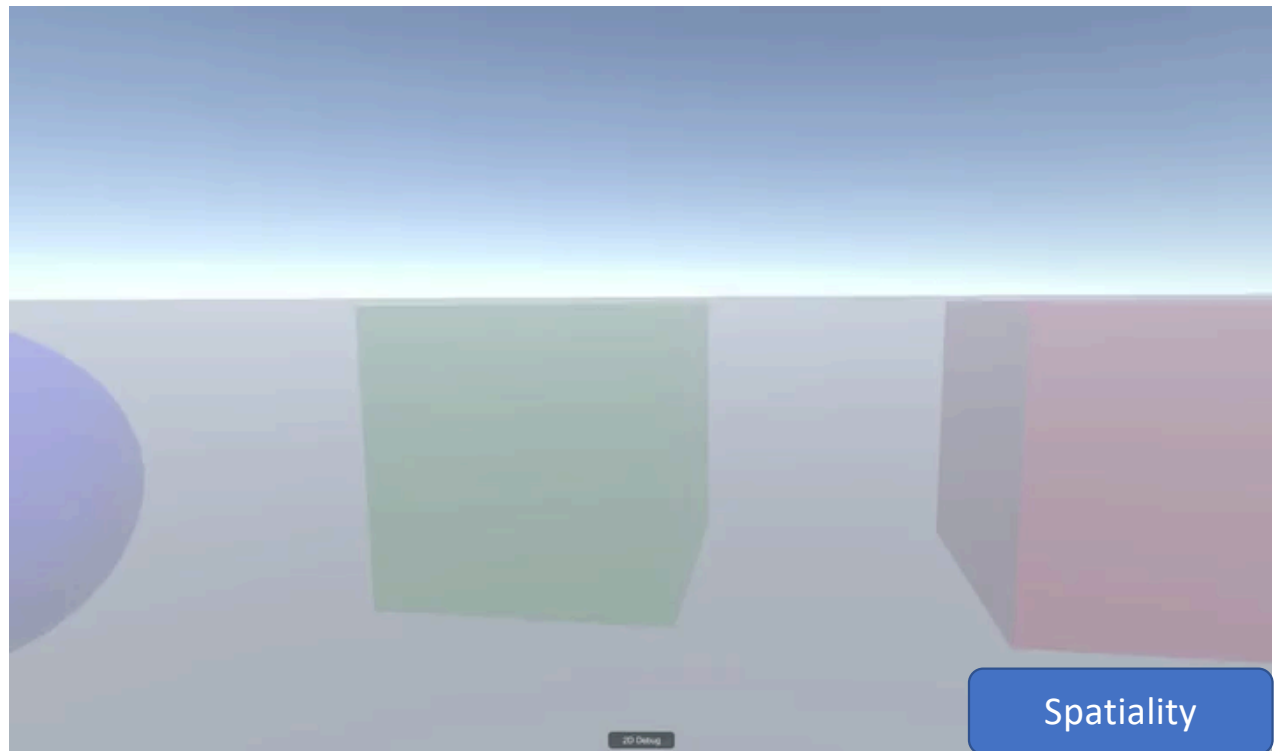
- Natural mapping vs decoupled mapping
- Free interaction vs locked interaction
- Object vs camera interaction

# Narrative - why

- Interactivity and influence vs passivity and linearity
- Concrete visualization vs abstract representation
- Nature-like laws of physics vs unexpected

# Example

Limited movement.  
No world space visualization.



# Example

Controller interaction.

Linear.

Abstract narrative  
object elements.



# Example

Limited movement.  
World space visualized.



# Example

Controller interaction.





# Example

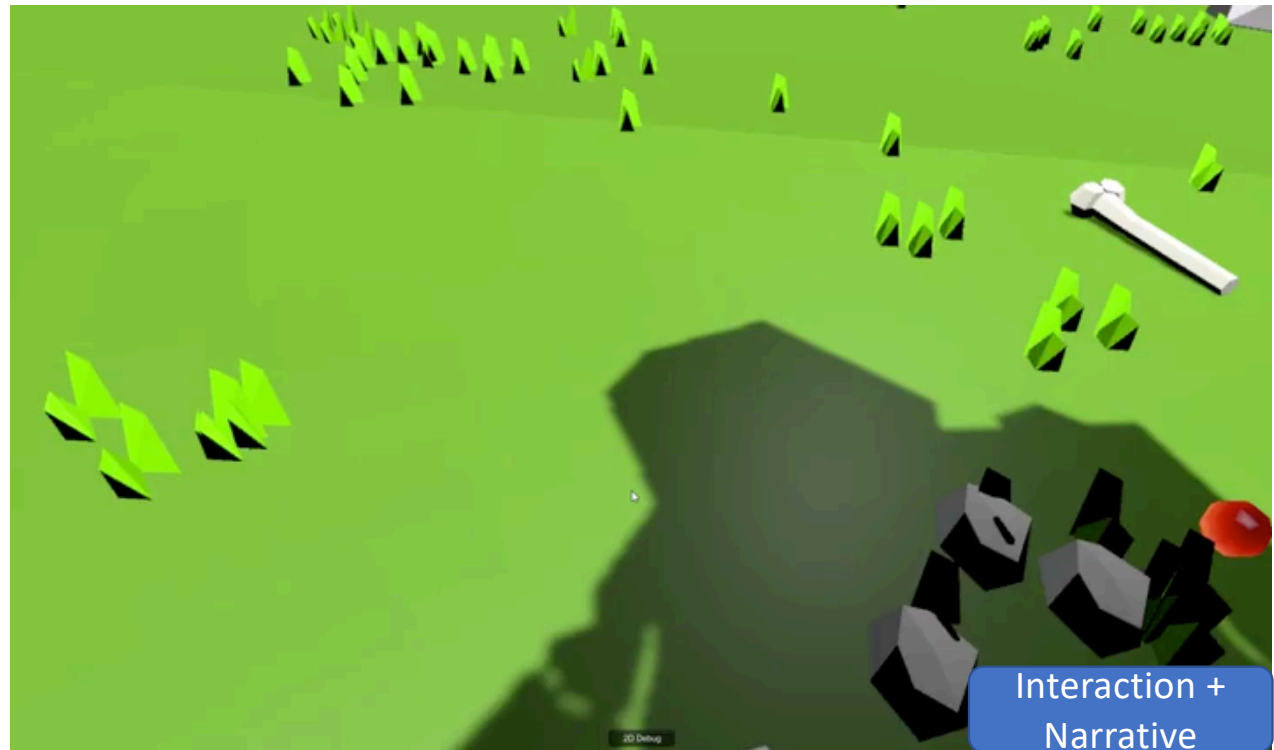
Interactive.  
Concrete narrative  
object elements



# Example

Controller interaction.

Interactive influential.  
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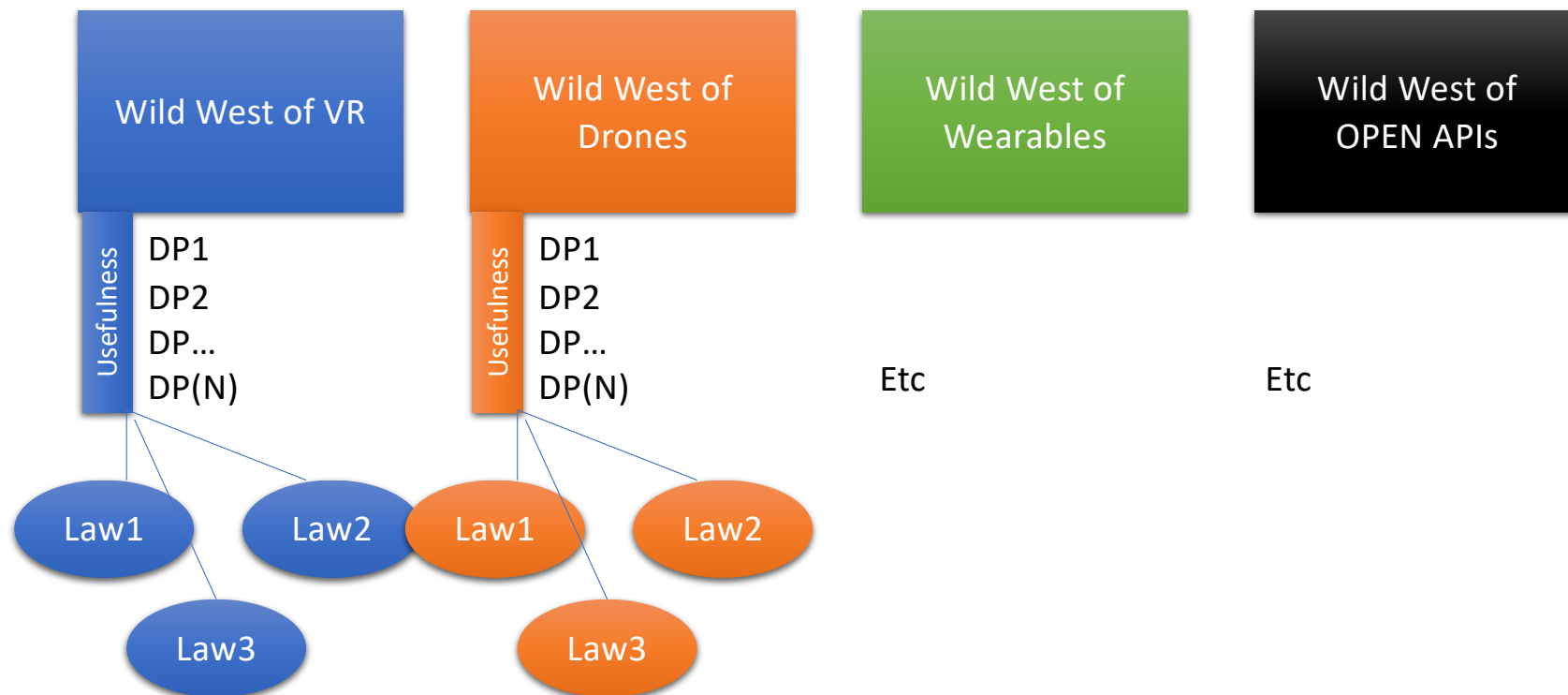


# Designing for *engagement*

- DP1: “Design for **depth of spatiality** through inclusion of both interaction and world space”
- DP2: “Design for **integration** of physical and virtual artefacts **through camera and object interaction**”
- DP3: “Design for **richness of narrative** through representation of concrete visualizations that **match functionality** and contribute to an **interactive plot structure**”

**“Great! Does that not mean that you just solved the Wild West problem?”**

Nope.



# Design Principles Genres

Inspired by Peffers et al. (2018)

# Back to the example: the “messy” study design



Artefact instantiation	Design principle 1 (Design for spatiality)	Design principle 2 (Design for interaction)	Design principle 3 (Design for narrative)
Scene A Condition 1	Limited movement. No world space visualization.	Controller interaction.	Linear. Abstract narrative object elements.
Scene A Condition 2	No movement. No world space visualization.	Interaction through camera controller.	Linear. Abstract narrative object elements.
Scene B Condition 3	Full movement. World space visualized.	No object interaction.	Interactive. Concrete narrative object elements.
Scene B Condition 4	Limited movement. World space visualized.	Controller interaction.	Interactive influential. Concrete narrative object elements.

(Schjerlund et al. 2018)

And indeed this is a common occurrence!

Disclaimer: Genre definitions can be a theoretical minefield

*(Chandler 1997)*

Genres are broadly characterised as categories based on commonalities between bodies of various works based on a single medium

*(Paraphrased from Chander 1997)*

# A proposition of general genre compositions

Narrative

Characters

Themes

Setting

*(Chandler 1997)*

Narrative: how were design principles uncovered?

Characters: who took part?

Themes: what was the content of the design principles?

Setting: what did the design principles revolve around?

Narrative: how were design principles uncovered?

Setting: what did the design principles revolve around?

# Study of Design Principles in action

- 17 papers proposing design principles as a contribution (Iivari et al. 2018)
- Papers were found from IS journals with broad themes, not just VR

Commonalities of the results so far:

Narrative:

1. Finding principles and building from them
2. Building/evaluating a solution and finding principles from them

Setting:

1. Solving technological problems in a context
2. Solving types of technological problems



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Commonalities of the results so far:

Narrative:

11,5

**Finding** principles  
and **building** from them

5,5

**Building/evaluating** a solution  
and **finding** principles from them

Setting:

5,5

Solving **types** of  
technological  
problems

6

Solving  
**contextual**  
technological  
problems

2,5

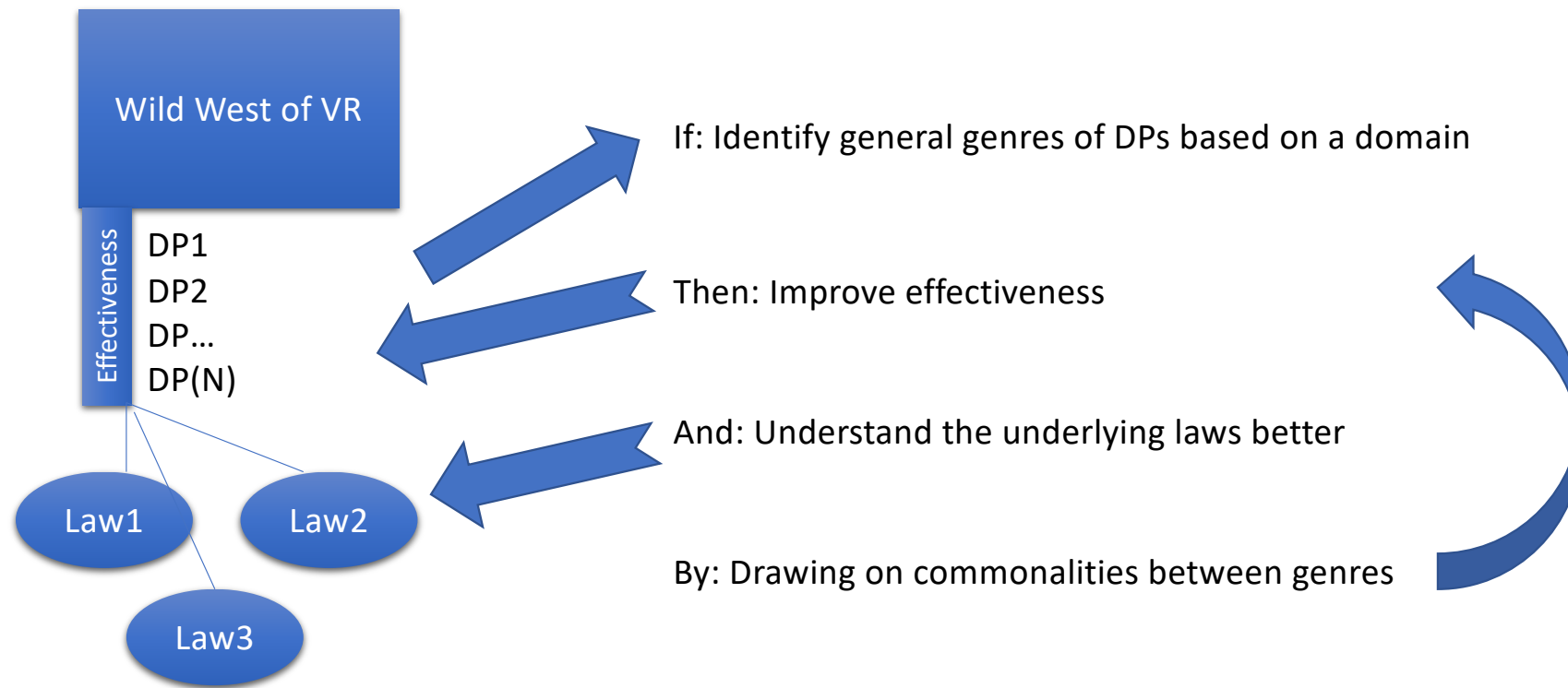
Solving **types** of  
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3

Solving  
**contextual**  
technological  
problems

# So what?

Well, to put it as a "rule"...



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# Thank you!

Questions?

# References

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