

## **WP8 - Dissemination and Exploitation**

**Jeroen Weermeijer**  
**KU Leuven**

**General Assembly meeting [05/05/2023]**



This project has received funding from the European Union's Horizon 2020 research and innovation Programme under grant agreement 945263 (IMMERSE)

# WP8 - Staff



**PhD Candidate @ Center for Contextual psychiatry  
Research Psychologist**

## **Practitioner perspectives on the use of the experience sampling software in counseling and clinical psychology**

Jeroen Weermeijer , Glenn Kiekens, Martien Wampers, Peter Kuppens & Inez Myin-Germeys

Received 30 Apr 2022, Accepted 15 Jan 2023, Published online: 14 Feb 2023

 Download citation  <https://doi.org/10.1080/0144929X.2023.2178235>




## **CHAPTER 6**



## **EXPERIENCE SAMPLING PLATFORMS**

Jeroen Dennis Merlijn Weermeijer, Glenn Kiekens & Martien Wampers

Applying multiverse analysis to experience sampling data: Investigating whether preprocessing choices affect robustness of conclusions

Jeroen Weermeijer , Ginette Lafit, Glenn Kiekens, Martien Wampers, Gudrun Eisele, Zuzana Kasanova, Thomas Vaessen, Peter Kuppens & Inez Myin-Germeys

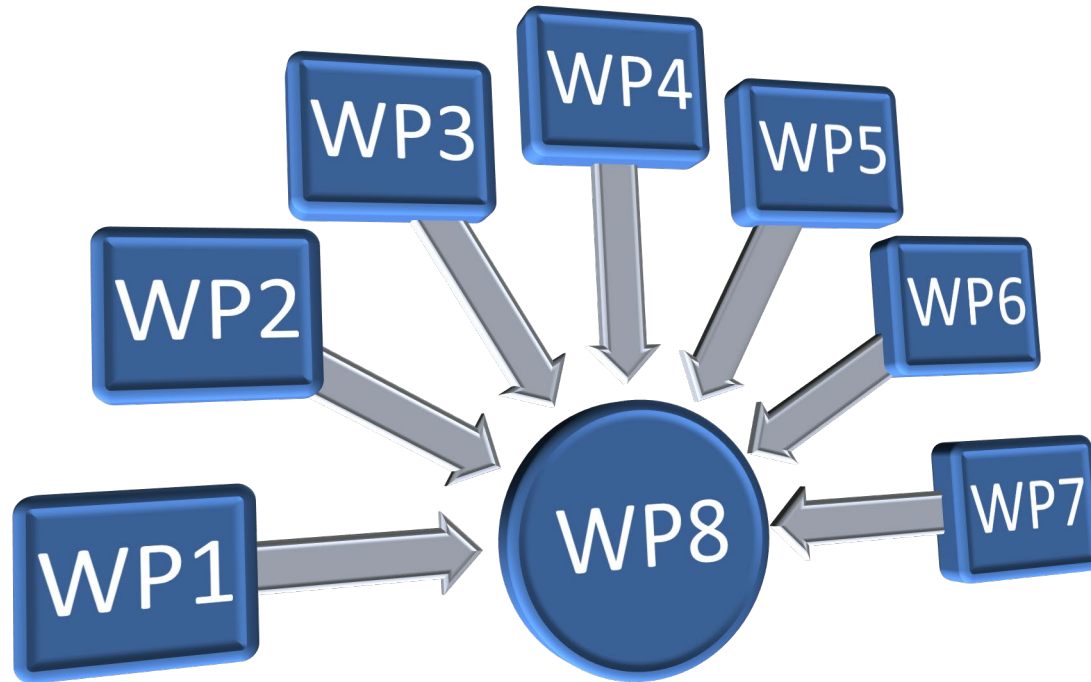
Usability of the experience sampling method in specialized mental healthcare: A pilot study

Jeroen Weermeijer (MSc)<sup>1</sup>, Martien Wampers (PhD)<sup>1</sup>, Lena De Thurah (MSc)<sup>1</sup>, Rafaël Bonnier (MSc)<sup>1</sup>, Maarten Piot (MSc)<sup>2</sup>, Peter Kuppens (PhD)<sup>2</sup>, Inez Myin-Germeys (PhD)<sup>1</sup>, Glenn Kiekens (PhD)<sup>1,3</sup>.



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# WP8 - Affiliates



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# WP8 – Overview of tasks



**Task 8.1. Set-up Exploitation Steering Group**

**Task 8.2. Dissemination plan**

**Task 8.3. Scientific exploitation plan**

**Task 8.4. Commercial exploitation plan**

**Task 8.5 Predictive models of implementation of digital mobile mental health technology**



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# WP8 – Task 8.1 Set-up Exploitation Steering Group



## What?

- **Group of experts to orchestrate and oversee activities of exploitation**
- **Prerequisite for Task 8.3 [scientific exploitation] and 8.4 [commercial exploitation]**

## When?

- **Set-up in month 4**

## With whom?

- **WP2 [Movisens]**



# WP8 – Task 8.1 Exploitation Steering Group



**Current status: ESG created**

## **ESG TASKS**

- 1. Tracking and protecting developed intellectual property**
  - I. **Open innovation outputs** [research output]
  - II. **Proprietary Assets** [source-code of software / algorithms]
- 2. Development of exploitation pathways**
  - I. **Linked to task 8.3 and 8.4** [scientific and commercial exploitation]



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# WP8 – Task 8.1 Exploitation Steering Group



## ESG, formal members

- Inez Myin-Germeys (WP1) Martine van Nierop (WP1); Simon Krause (WP2); Joerg Ottenbacher (WP2); Thomas Ganslandt (WP3); Georgia Koppe (WP4); Luca Marelli (WP6); Ulrich Reininghaus (WP7); Anton Heretik (WP7); Iveta Nagyova (WP7); Matthias Schwannauer (WP7); Jeroen Weermeijer (WP8)

## ESG, informal members: LRD representative



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# WP8 – Task 8.1 Exploitation Steering Group



## ESG – two meetings so far

- **Discussed identified commercial exploitation pathways** [more about that later]
- **Review of market analysis for DMMH-like interventions** [more about that later]

Next meeting, July 3<sup>rd</sup> [pricing plan for DMMH and consulting for therapy builder designs]



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# WP8 – Task 8.2 Dissemination plan



## What?

- **Plan for disseminating research outputs, deliverables and milestones of IMMERSE**
- **Delineates requirements for dissemination**

## When?

- **Living document, continuously updated throughout the project**

## With whom?

- **All WPs**



## Officially promised and delivered

1. Standard Acknowledgement
2. Procedures for planning articles, preregistrations and abstracts
3. Procedures for submitting articles (incl registered reports)
4. Post-review process
5. Open access (Grant Agreement, Article 29)
6. Setting up a Data Governance Board (DGB)
7. Outlining the topics of interest for the Early Career Researchers
8. Define principles of authorships
9. Setting up a dissemination tracking system
10. Dissemination first 2 deliverables
11. Public website overhaul

## Unofficially promised and progress?

12. Public information on studies
13. Phase 1 blog posts
14. Pre-print study protocol
15. Further dissemination of deliverables
16. Increase social media presence
17. Promote early-career researcher work
18. Patient advisory boards
19. Dummy datasets
20. Define main paper outcomes



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# WP8 – Task 8.3 Scientific exploitation plan



## What?

- **DROPS: a system for submitting abstracts to get data access**
  - Delineates who gets data access for planned study
  - Archives what has been (or is being) done by whom
  - Facilitates Open Science (e.g., pre-reg, timestamped dataset)

## When?

- Living system, continuously updated throughout the project

## With whom?

- **WP1 and WP3**



# WP8 – Task 8.3 Scientific exploitation plan

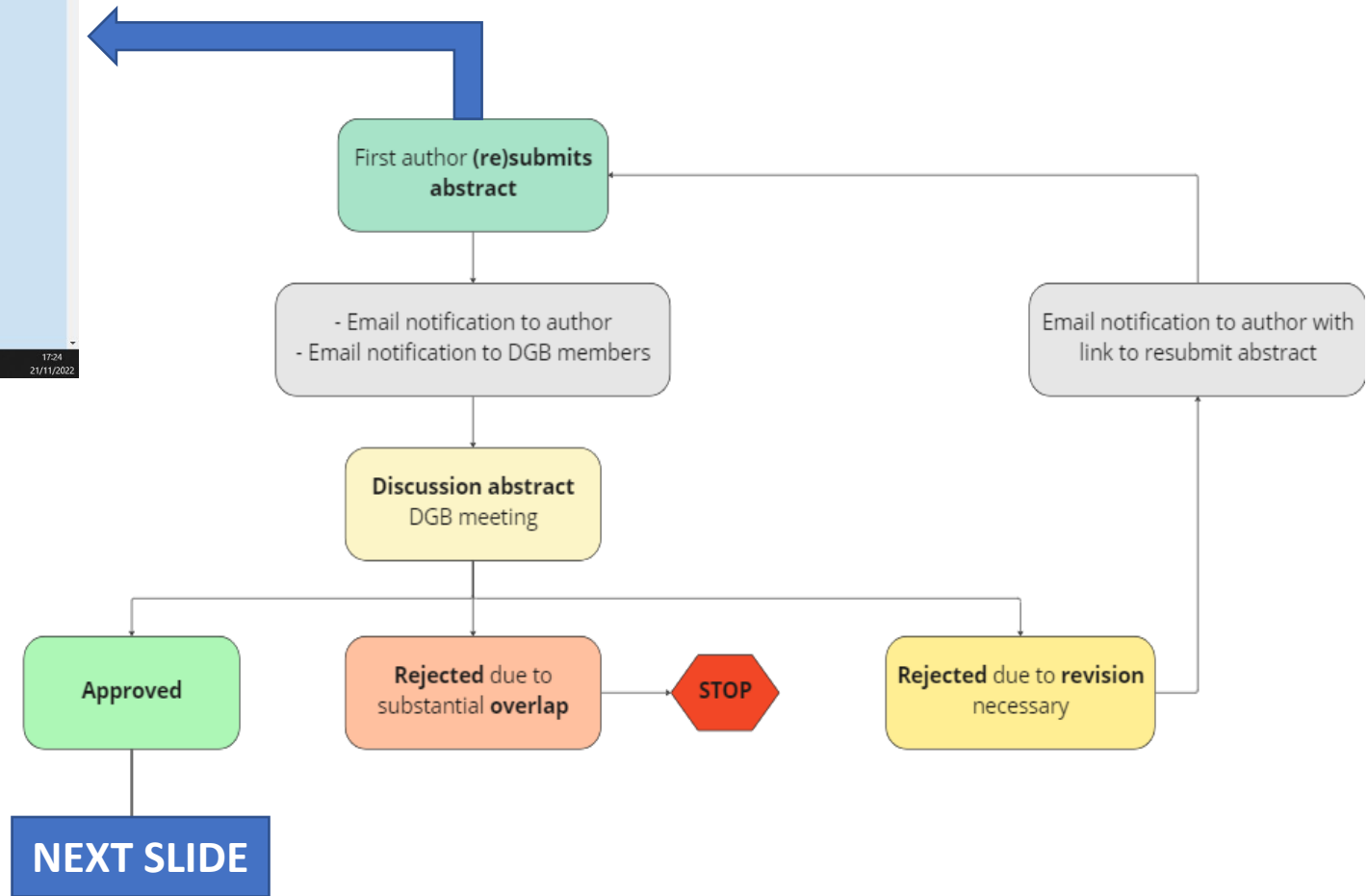
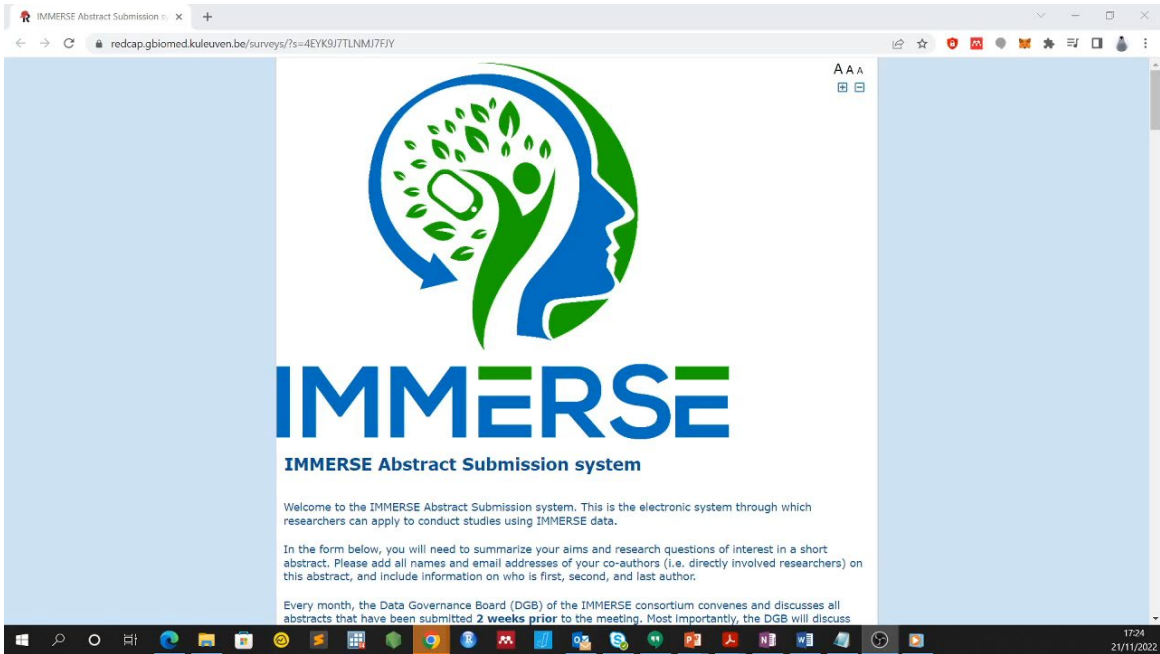


## Status:

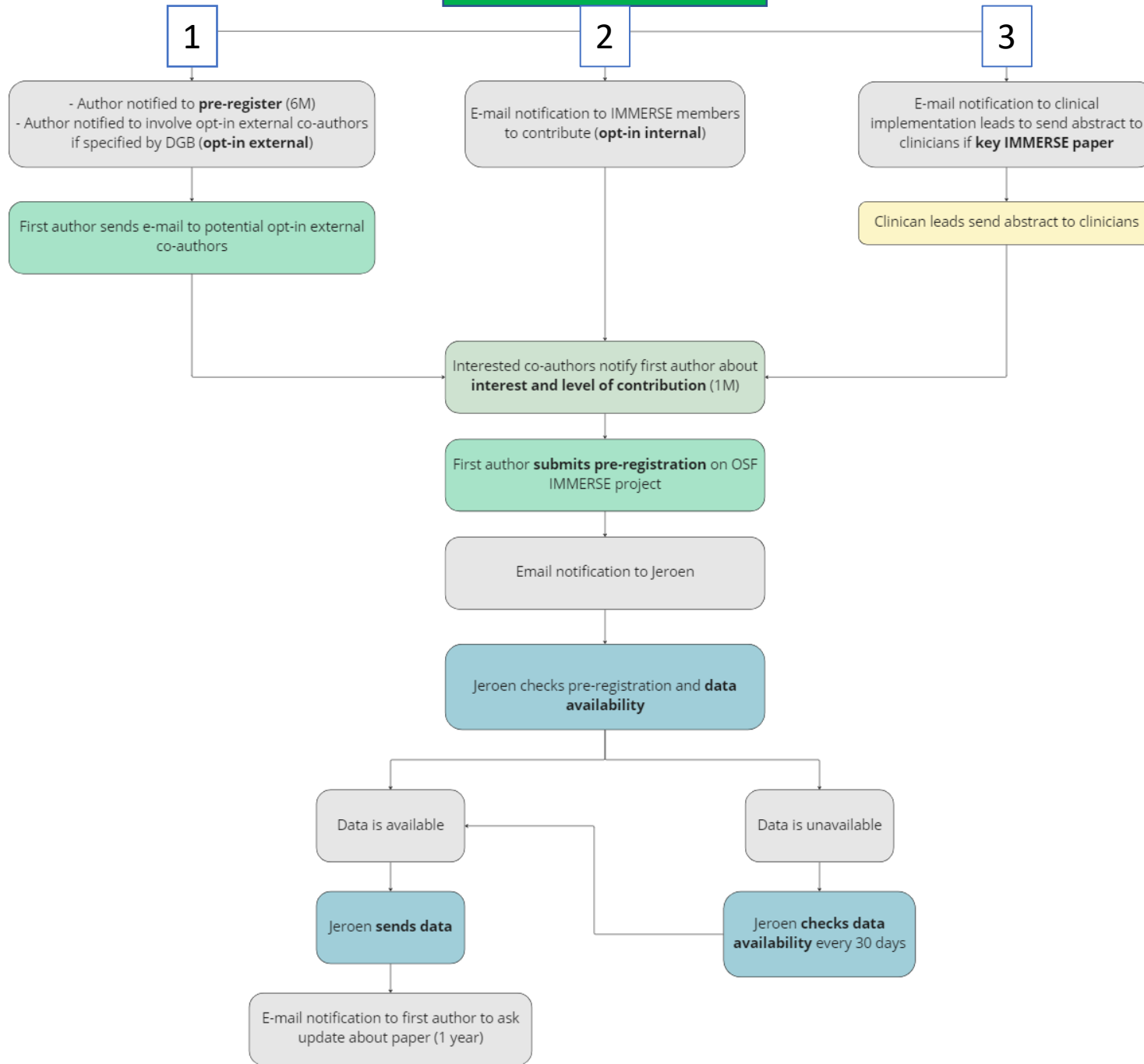
- **DROPS has been developed**
- **A data governance board has been set-up and decides on submitted abstracts**
- **The board meets once a month**
  
- **A short demo...**



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# Abstract approved



Notify

Pre-reg

Data access & Follow-up



# WP8 – Task 8.3 Scientific exploitation plan



## Current update:

- 17 abstracts have been submitted to DROPS
- 12 approved, 5 under revision

## Redcap format

- User feedback indicated a need for a more user-friendly overview
- Synchronous Google Doc

### DROPS

## Abstract Review Documentation

Last update: 13/01/2023

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**Data Governance Board members**

Anita Schick	Ine Van Hoyweghen	Luca Marelli	Michel Wensing
Anton Heretik	Inez Germeyns	Maria Wolters	Simon Krause
Daniel Durstewitz	Iveta Nagyova	Martine van Nierop	Thomas Ganslandt
Georgia Koppe	Jeroen Weermeijer	Matthias Schwannauer	Ulrich Reininghaus
Glenn Kiekens	Johannes Schneider	Michal Hajdúk	Zuzana Katreniaková

**Upcoming Meeting dates**

- 18/05/23
- 15/06/23
- 20/07/23
- 17/08/23
- 21/09/23

**Instructions**

- Navigate using the menu on the left, click on 'Record ID overview' to get started
- [A]= approved
- [R]= under revision
- [N]= new, requires feedback



# WP8 – Overview of tasks



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# WP8 – Task 8.4 Commercial exploitation plan



## What?

- Identify commercial exploitation pathways
- Implement market analysis and conduct business case for selected pathway

## When?

- Continuous throughout the duration of the project

## With whom?

- WP2 and WP7



# WP8 – Task 8.4 Commercial exploitation plan



## Current status (1/2)

- **Commercial exploitation routes have been identified**
  - **Exploitation routes independent of IMMERSE outcome [technology transfer package]**
    - **Medical device regulation consultancy**
    - **Therapy builder software [i.e., software package developed for creating interventions like DMMH]**
    - **DROPS fee-for-service**
  - **Exploitation routes dependent of IMMERSE outcome [WP8 aim]**
    - **DMMH app exploitation as a mHealth product [e.g., reimbursement frameworks, HIBs]**
      - **Preparatory: Explore maturation of previous proof-of-concept mHealth app to facilitate this process (if DMMH trial outcome is positive)**
    - **Algorithms for delineating treatment targets**



# WP8 – Task 8.4 Commercial exploitation plan



## Current status (2/2)

- **Market Analysis: mHealth apps for mental healthcare [Deliverable 8,3]**  
→ completed, reviewed by ESG



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# WP8 – Task 8.4 Commercial exploitation plan



## Current status (2/2)

- **D8.3 Market Analysis: mHealth apps for mental healthcare**
  - ⇒ **Broad / Narrow**
  - ⇒ **PESTEL analysis**
  - ⇒ **Porter's five forces**
  - ⇒ **SWOT analysis**



# WP8 – D8.3 Market Analyses and Strategy

## *Market overview on mHealth*

→ **BROAD scope: mobile technologies, such as smartphones, tablets, and wearables, to deliver healthcare services.**

### **1. Market size**

- **What was the total amount of revenue from sales of, for 2022, mHealth products and services?**

### **2. Growth rate**

- **What do experts say on compounded annual growth rate (CAGR)?**

### **3. Geographical spread of revenue**

- **Where is the money to be made?**

**Solution: market reports!**





**Complete report 100+ pages -> ~ € 5,000**

**Summary 4-5 pages -> free**



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## *Answers to broad scope questions:*

1. **2022 market size: median 57.3 Billion EUR, with a range between 42.1 and 120.1 Billion EUR.**
  - I. **Unclear what percentage attributable to mHealth apps like DMMH**
  - II. **Market sufficiently large to attract investors**
  
2. **median CAGR rate reported was 14,95%, with a range between 10.8% and 34,8% for a median of 9 years and a range of 6 to 10 years.**
  - I. **Outperforms current inflation (~9%)**
  - II. **Outperforms S&P500 average annual rate of return (~10%)**
  - III. **Abundance of growth drivers as compared to growth limiters**
  
3. **Current geographical spread of revenue**
  1. **North America ~40%, EU ~30%**
  2. **However, Asia Pacific mentioned as most potential for growth**

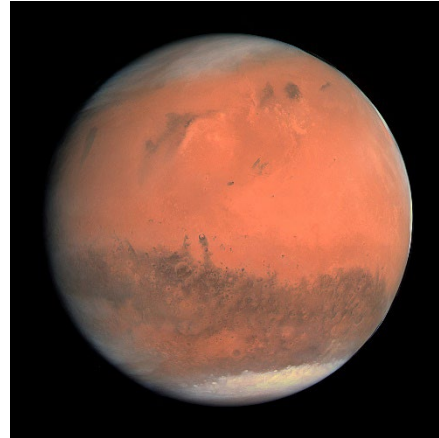


**Broad** → **Narrow**



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# Potential Market size for DMMH



**MaRs: calculate the total amount of potential revenue**

$$\text{Market Size} = \sum_{n=1}^{\text{number of customer types}} (\text{Customer Type } n) \times (\text{Penetration rate } n) \times (\text{value per sale } n)$$



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$$\text{Market Size} = \sum_{n=1}^{\text{number of customer types}} (\text{Customer Type } n) \times (\text{Penetration rate } n) \times (\text{value per sale } n)$$

### Customer types:

- a) Mental health institutions/practitioners
- b) Medium-sized companies
- c) Large companies
- d) Universities

### Penetration rate:

- a) 10 – 40%
- b) 2 – 6 %
- c) 2 – 6%
- d) 2 – 6%

### Value per sale:

- a) €60-120 p/y per practitioner
- b) €600-1,200 p/y
- c) €2,400-4,800 p/y
- d) €1.2-2.4 p/y per student

business product

commercial product



	Mental Health Institutions	Mental health practitioners	Companies	Universities and colleges
Belgium	118*	10.785 Psychologists 1.958 Psychiatrists	4.221 Medium 944 Large	73 Universities and colleges 279.145 Students
The Netherlands	2.042	15.000 Psychologists 3.500 Psychiatrists	9.200 Medium 1.880 Large	105 Universities and colleges 340.000 Students
Australia	161*	10.716 Psychologists 3.615 Psychiatrists	59.355 Medium** 4.533 Large**	43 Universities, ?? colleges 1.622.894 Students
UK	1.026	46.400 Psychologists 13.130 Psychiatrists	35.940 Medium 7.675 Large	285 Universities and colleges 2.182.560 Students
USA	12.275	181.600 Psychologists 25.520 Psychiatrists	36.3269 Medium 51.795 Large	3.982 Universities and colleges 19.400.000 Students
Canada	128*	19.591 Psychologists 4.770 Psychiatrists	22.725 Medium** 2.936 Large**	436 Universities and colleges 1.400.000 Students
Germany	738*	36.514 Psychologists 23.438 Psychiatrists	55.740 medium 11.317 large	422 Universities and colleges 2.950.000 Students
Slovakia	54*	295 Psychiatrists 287 Psychologists	1.129 Medium 224 Large	35 Universities and colleges 131.083 Students
<b>TOTAL</b>	<b>16.542</b>	<b>320.901 Psychologists</b> <b>76.218 Psychiatrists</b>	<b>551.579 Medium</b> <b>81.304 Large</b>	<b>5.381 Universities and colleges</b> <b>28.304.682 Students</b>

\*does not include private enterprises

\*\*Australia defines medium-sized companies as companies with 20 to 199 employees and large companies as companies with more than 200 employees. Canada applies a 100-499, 499+ criterion. These criteria differ from other geographical regions, in which the 50-250, 250+ criteria is used.

*Note: Numbers reported in this table reflect the most recently available historical data that we could identify. They are, at best, interpreted as a rough estimate. True numbers are likely to be higher, provided that the mental healthcare industry is rapidly growing.*



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	Customer Count	Penetration rate	Pricing	Estimate
Mental health institutes	16.542	0,1-0,4	*	*
Psychiatrists and psychologists	397.119	0,1-0,4	€60-120	From €2.382.714 to €19.061.712 per year
Medium-sized companies	551.579	0,02-0,06	€600-1.200	From €6.618.948 to €39.713.688 per year
Large-sized companies	81.304	0,02-0,06	€2.400-4.800	From €3.902.592 to €23.415.552 per year
Universities and colleges	5.381	0,02-0,06	*	*
Students	28.304.682	0,02-0,06	€1,2-2,4	From €679.312 to €4.075.874
			<b>Total:</b>	<b>From €13.583.566 to €86.266.826 per year</b>

**Enough?**

**IMEC iStart program: minimum revenue of 1 Million euros within a three-year timeframe.**

**However, ... note at where most potential revenue is situated**



	Customer Count	Penetration rate	Pricing	Estimate
Mental health institutes	16.542	0,1-0,4	*	*
Psychiatrists and psychologists	397.119	0,1-0,4	€60-120 (x30)	<b>From €71.481.420 to €571.851.360 per year</b>
Medium-sized companies	551.579	0,02-0,06	€600-1.200	From €6.618.948 to €39.713.688 per year
Large-sized companies	81.304	0,02-0,06	€2.400-4.800	From €3.902.592 to €23.415.552 per year
Universities and colleges	5.381	0,02-0,06	*	*
Students	28.304.682	0,02-0,06	€1,2-2,4	From €679.312 to €4.075.874
			<b>Total:</b>	<b>From €82.682.272 to €639.056.474 per year</b>

**Alternative pricing model → reimbursement (government or insurance)**  
**Product is free for practitioners, but cost is billed to the client's insurance (e.g., same as how kidney dialysis is billed following doctor prescription)**  
**Assumption: ~30 clients per year**  
**→ The reimbursement pathway is crucial for business development**



**Industry and Market segment can attract investors! However...**

**→ Macro-environmental factors affecting business success?**

**PESTEL analysis**

**→ Competitive landscape of the market segment?**

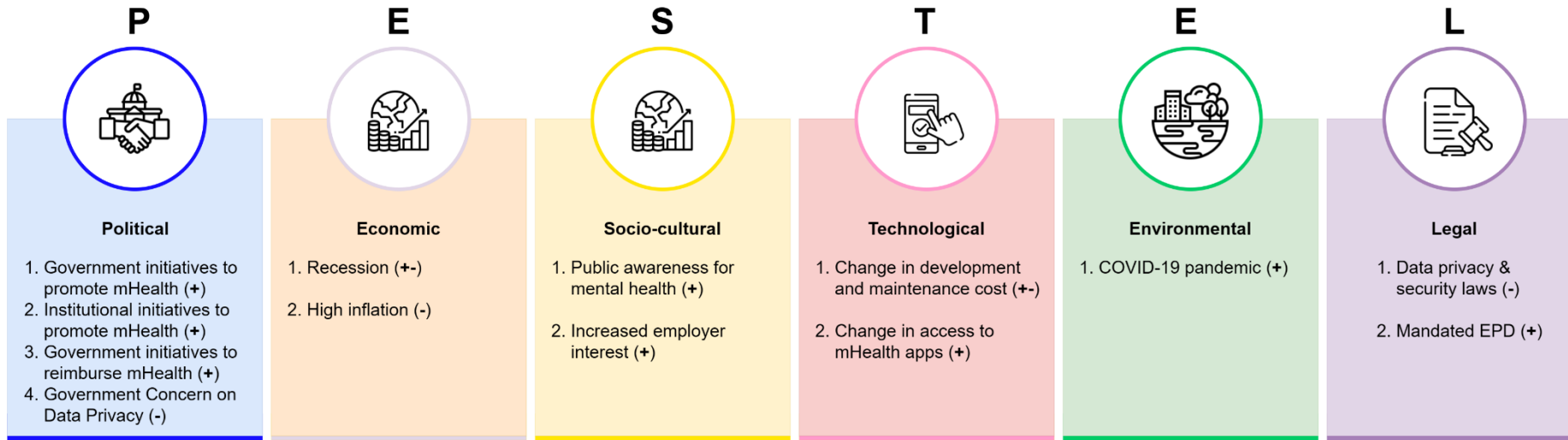
**Porter's five forces framework**

**→ What are strengths, weaknesses, opportunities, and threats to our product?**

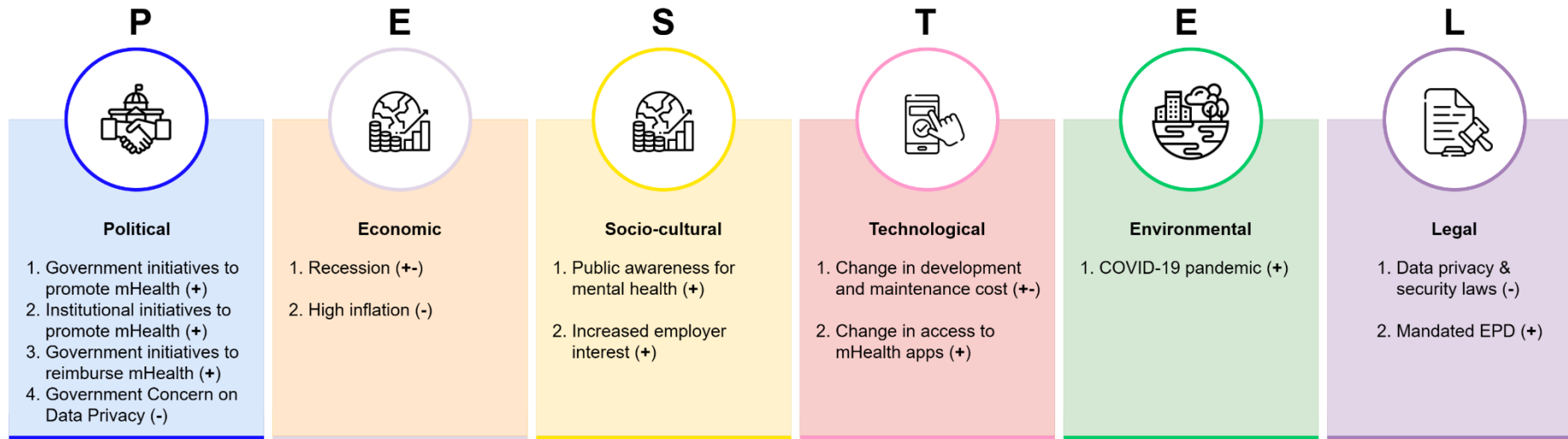
**SWOT analysis**







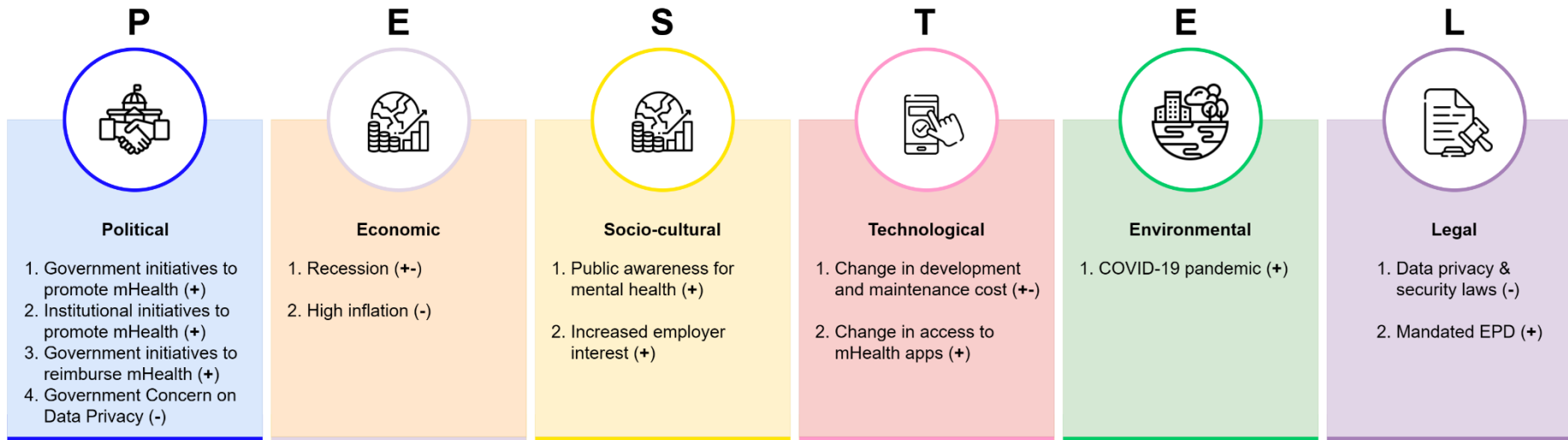
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- Belgium gov. → [mHealthbelgium.be/apps](https://mHealthbelgium.be/apps)
- Dutch gov. → [zorgvannu.nl/innovaties/overzicht](https://zorgvannu.nl/innovaties/overzicht)
- APA → [psychiatry.org/psychiatrists/practice/mental-health-apps](https://psychiatry.org/psychiatrists/practice/mental-health-apps)
- German gov. → [bundgesundheitsministerium.de/en/digital-healthcare-act.html](https://bundgesundheitsministerium.de/en/digital-healthcare-act.html)
- UK gov. → [gov.uk/government/publications/a-plan-for-digital-health-and-social-care/a-plan-for-digital-health-and-social-care](https://gov.uk/government/publications/a-plan-for-digital-health-and-social-care/a-plan-for-digital-health-and-social-care)
- EU → GDPR

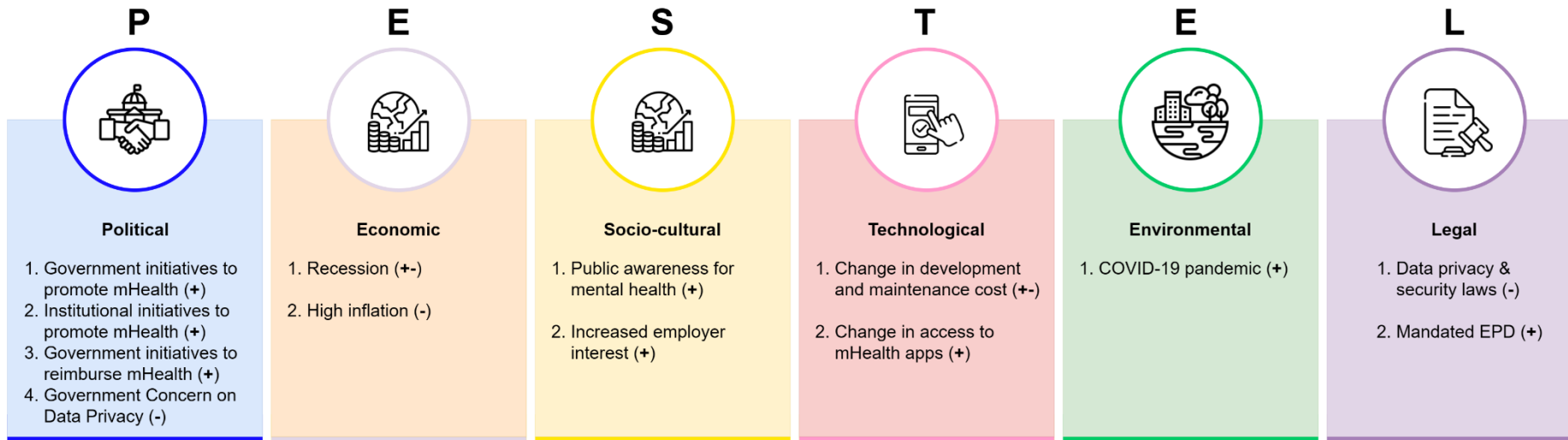


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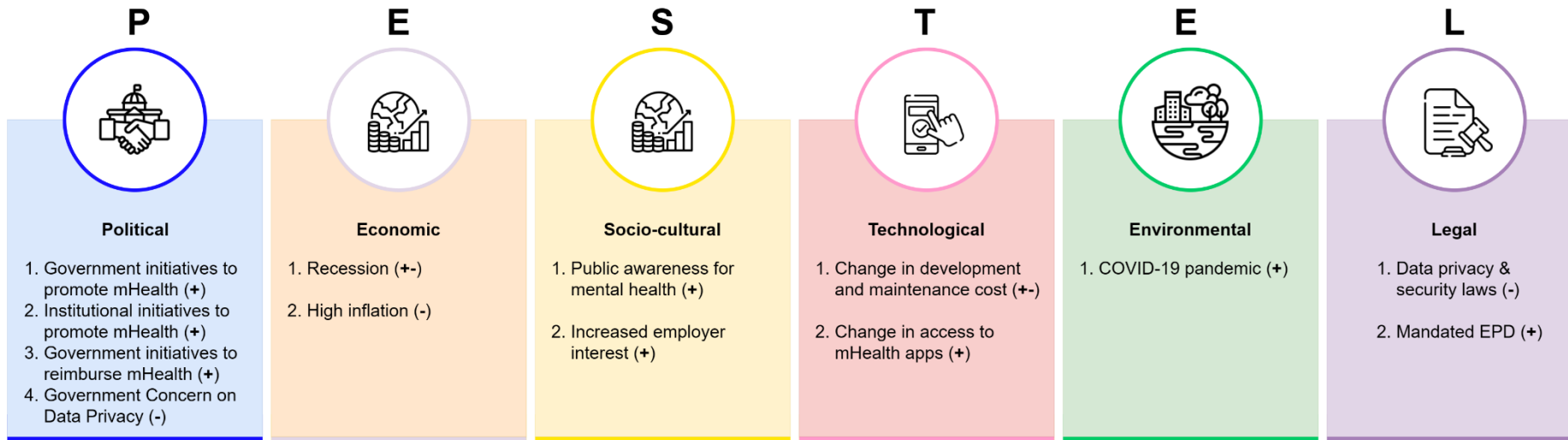
- Recession: Population mental health declines (*Frasquilho et al., 2015*)
  - Increases demand for mental healthcare
  - But... decreased consumer spending
- High inflation:
  - Decreases purchasing power





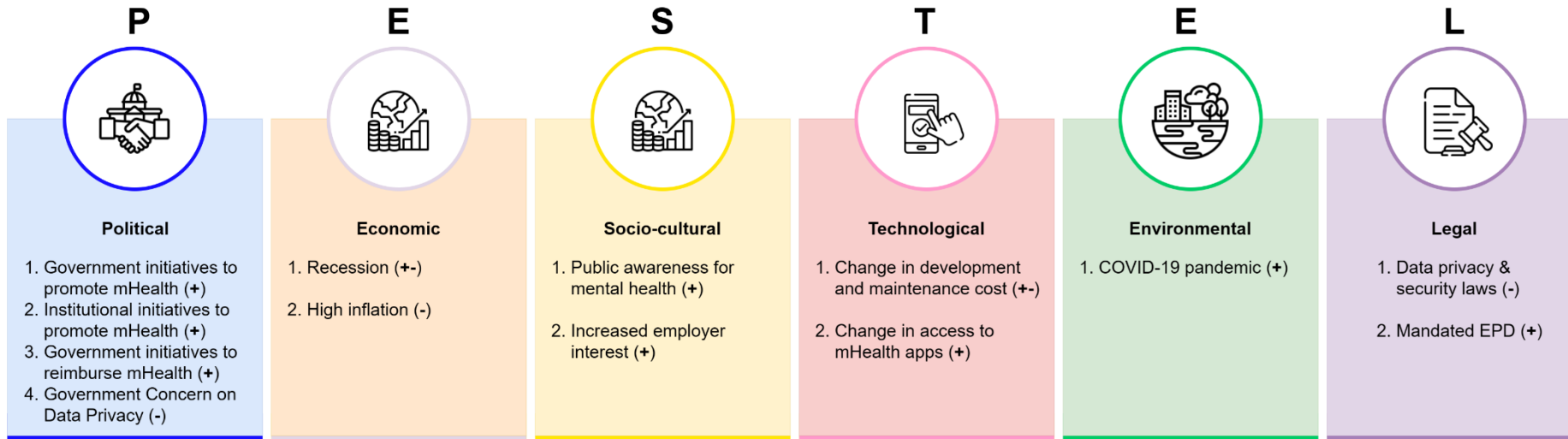
1. Increased public awareness for mental health: media
  - Celebrities (e.g., **Selah Sue**; **Beyonce**)
  - Tragic accidents: (e.g., **2015 Germanwings flight 9525**; **2018 Chongqing bus**)
2. Increased employer interest
  - Negative impact on revenue (e.g., **Ratnawat et al., 2014**)





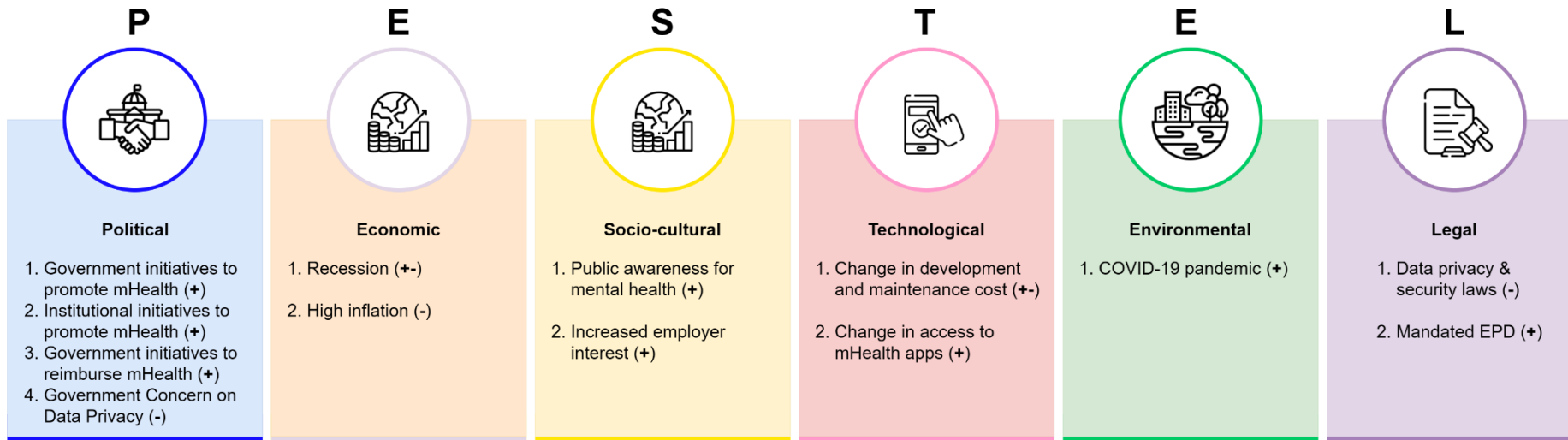
1. Changes in development and maintenance costs
- It's becoming increasingly easier to create apps, this reduces development costs
  - But... regulatory frameworks may increase maintenance
2. Changes in access to mHealth apps
- Increased phone ownership





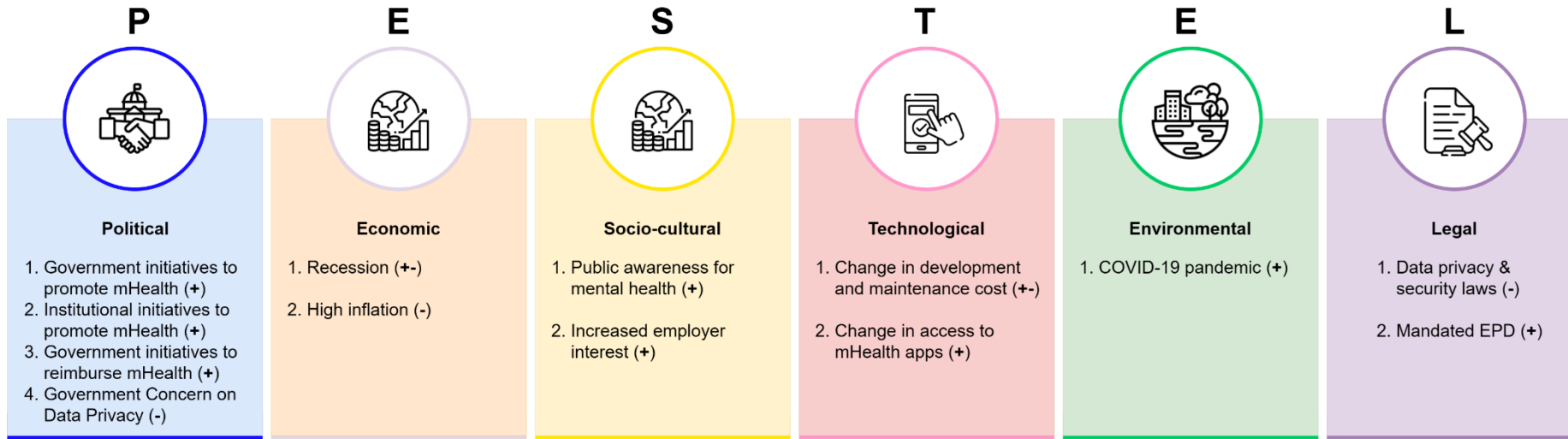
1. COVID-19 pandemic  
 ➤ Digitalization → increased demand for mHealth apps





- 1. Data privacy & security laws
  - 1. EU: **GDPR**
  - 2. US: **HIPAA**
- 2. Mandated EPDs coming up
  - 1. Belgium: **'De kwaliteitswet' & Royal decree**

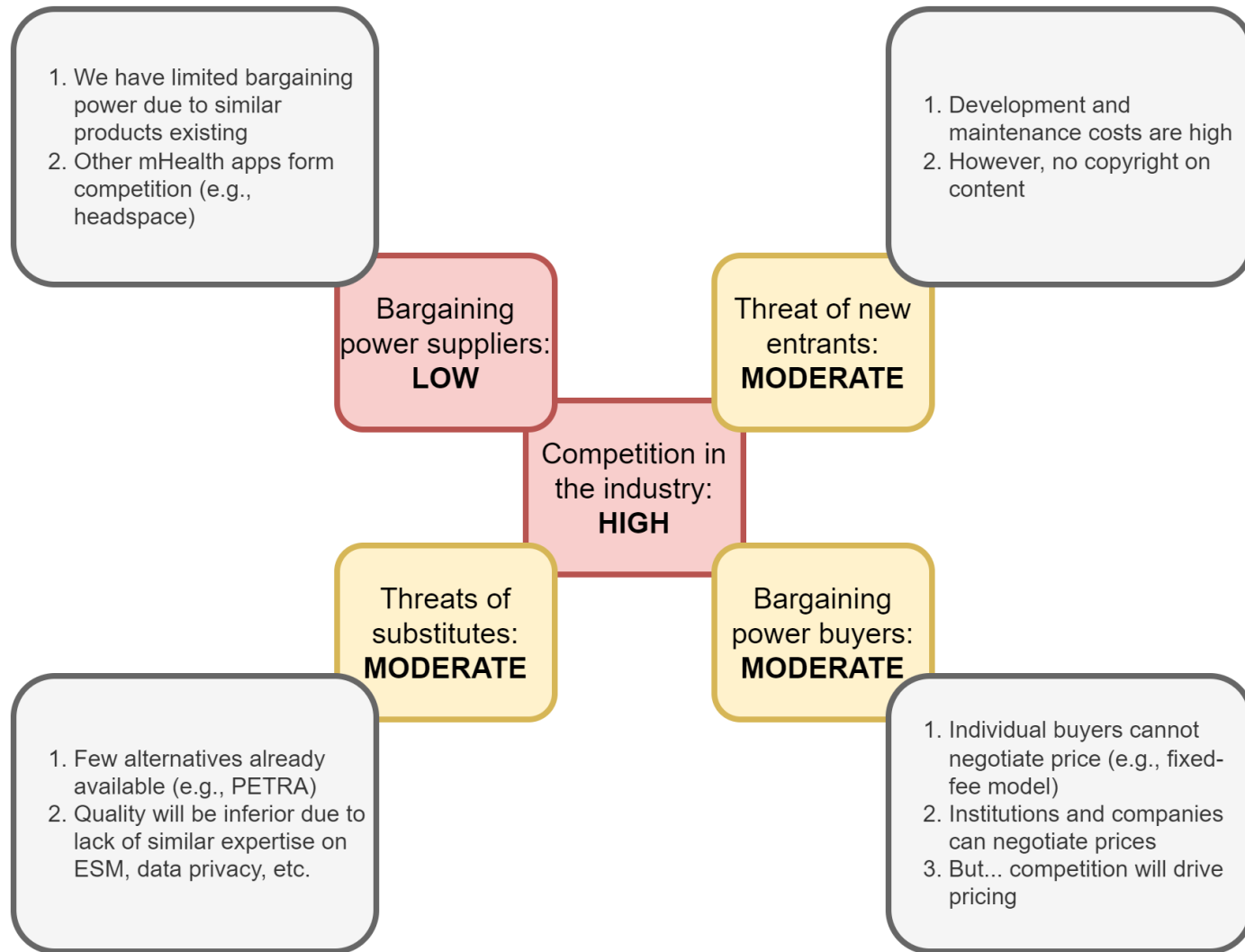




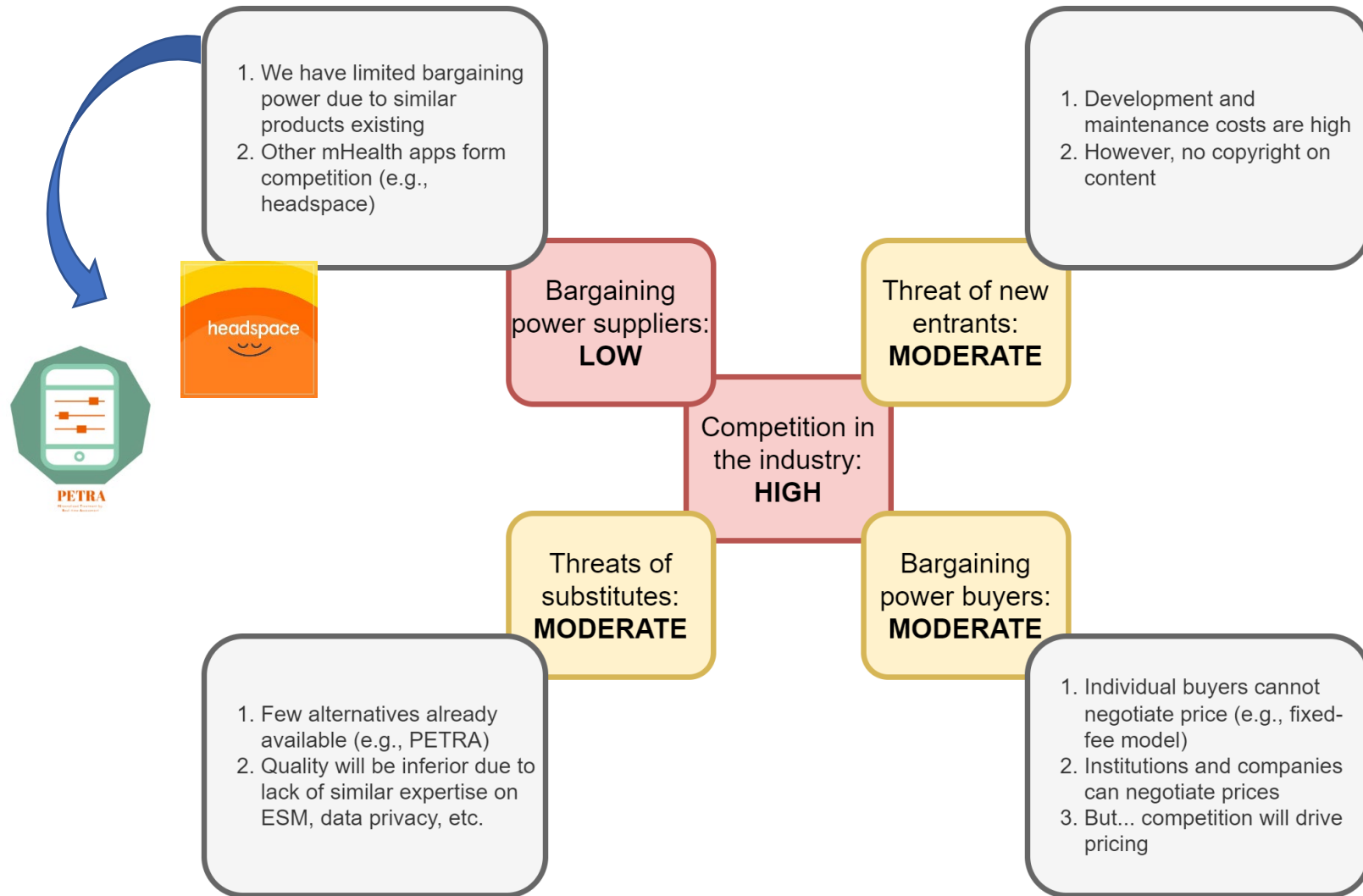
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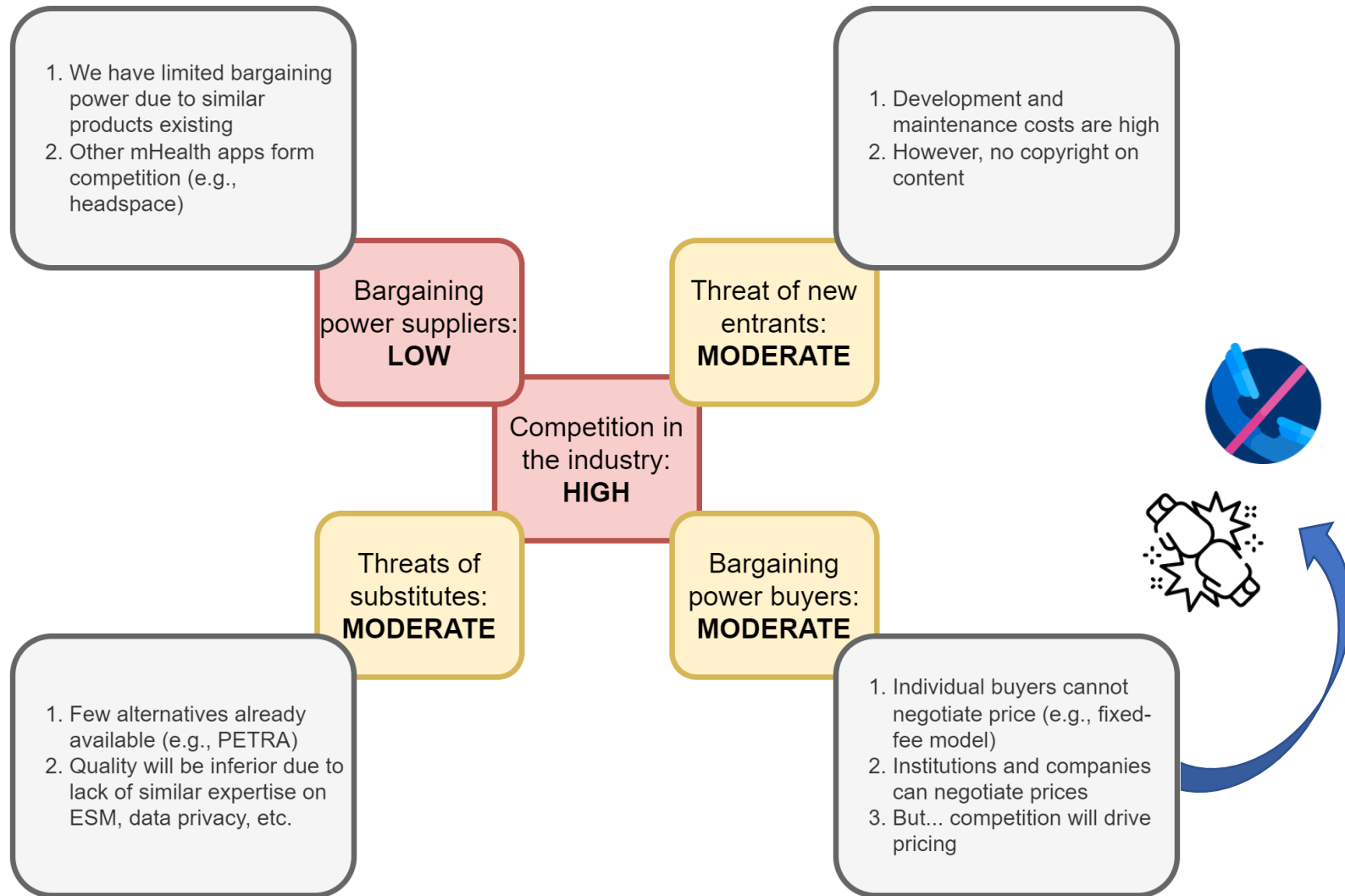
# PORTER'S FIVE FORCES



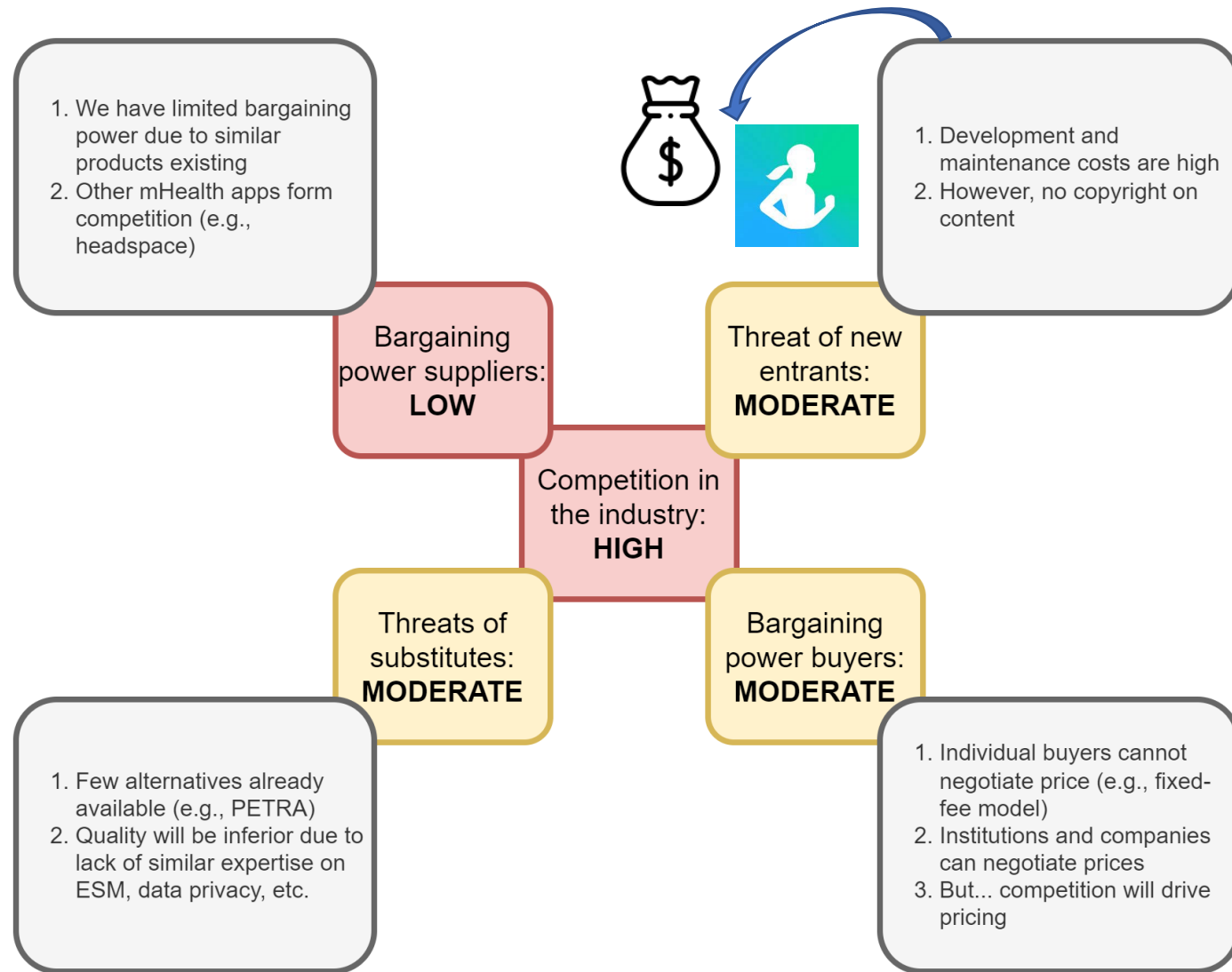
# PORTER'S FIVE FORCES



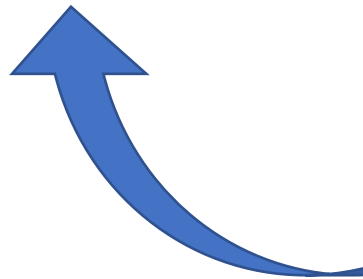
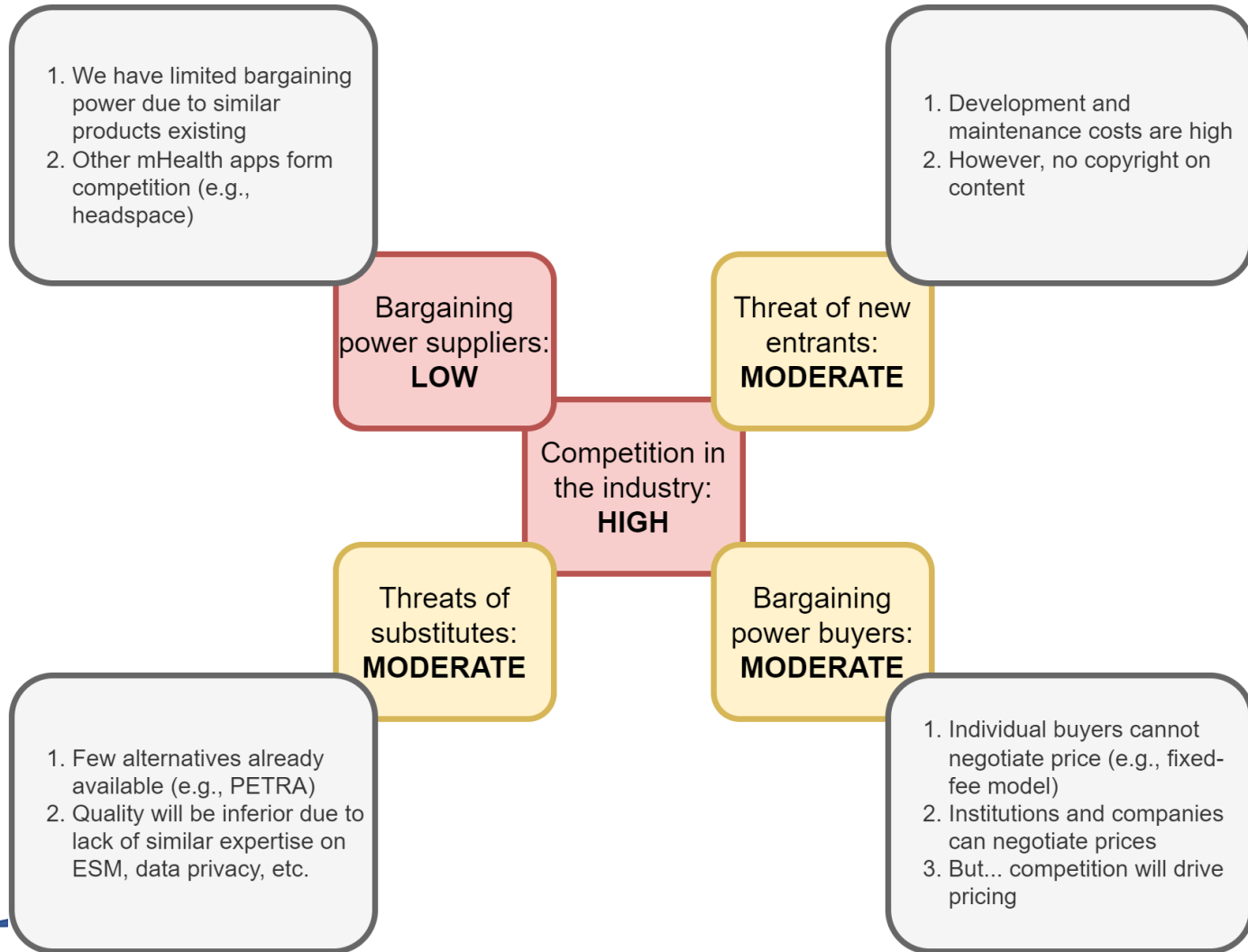
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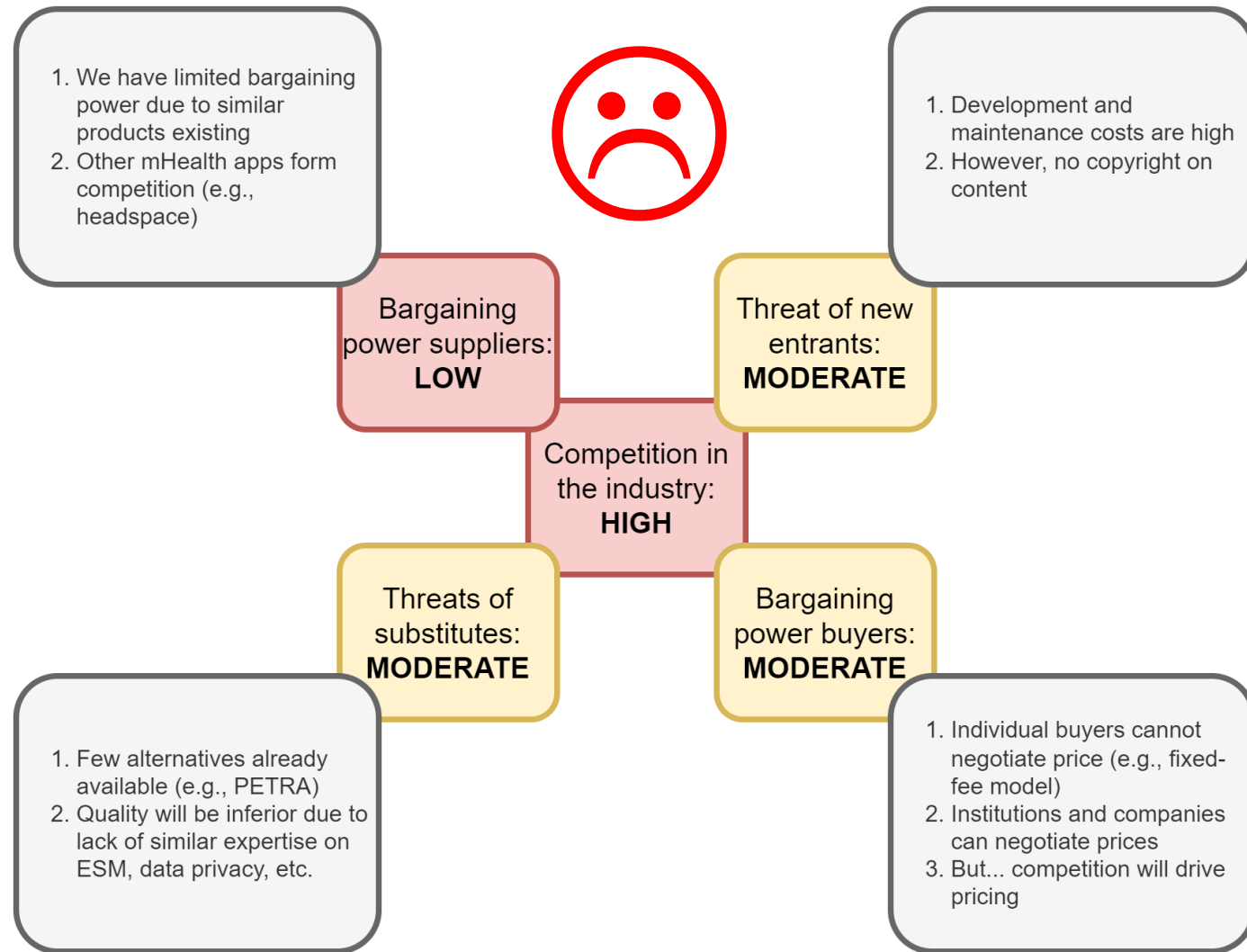
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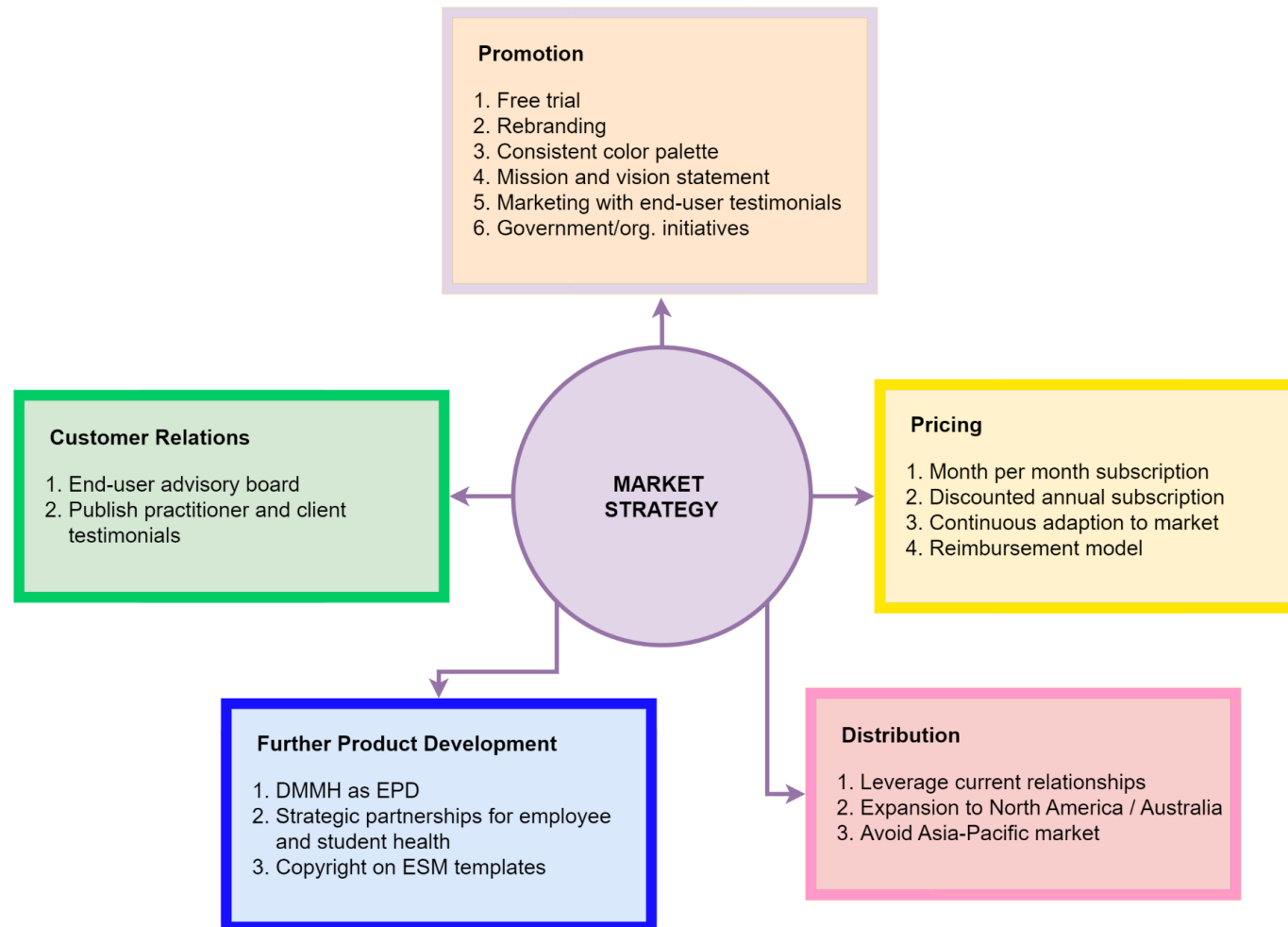
# PORTER'S FIVE FORCES



# DMMH SWOT ANALYSIS



# WP8 – Overview of tasks





# WP8 – Overview of tasks



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# WP8 – Task 8.5 Predictive models of implementation of digital mobile mental health technology



## What?

- Utilize data from the outcome of implementation studies (WP7) and stakeholder involvement (WP5) to construct predictive models of the adoption of the MoMent intervention by initial users, and how local policies and EU-wide regulations (WP6) influence other potential adopters

## When?

- Month 36-48 of the project

## With whom?

- WP5, WP6, WP7



# WP8 – Task 8.5 Predictive models of implementation of digital mobile mental health technology



## Current status:




- Not yet started – task for the future



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# WP8 – Deliverables & Milestones



Milestone / Deliverable No.	Title	Delivery date [project month]	Status
D8.1	Exploitation Steering Committee Charter	4	
D8.2	Dissemination plan	6	
D8.3	Market analysis and strategy	24	
D8.4	White paper on forecasting models	48	
MS14	Market for DMMH mapped	24	



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# WP8 – Upcoming activities



- **Improvement website / twitter**
- **DROPS management**
- **Dissemination of ECR blogs and new deliverables**
- **Horizon 2020 Booster application for aid in dissemination and exploitation**
- **Investigating MDR**
- **Utilize market analysis to develop a business proposal on how to license MOMENT app**
- **Preparatory work for developing predictive models of implementation**



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