



Rada do spraw cyfryzacji

Zespół: Edukacja cyfrowa

2018-03-02

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- **Dominik Batorski**
- **Krzysztof Goczyła**
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- **Jerzy Nawrocki**
- **Katarzyna Śledziwska**
- **Janusz Zawiła - Niedźwiecki**



Proposition of the Informatics *Body of Knowledge*

Jerzy Nawrocki

Konsultacje:

Justyna Skorupska

Dominik Batorski

Krzysztof Goczyła



ACM/IEEE Computer Science Curricula 2013

ACM/IEEE Computer Eng. Curricula 2016

ACM/IEEE Soft. Eng. 2014 Curriculum Guidelines

ACM/AIS IS 2010 Curriculum Guidelines

ACM/IEEE Information Technology ~~2008~~ 2017

EDISON Data Science Framework (Oct. 2016)

ACM/IEEE/AIS/IFIP Cybersecurity Curricula 2017



Strengths

Weaknesses

+ Hierarchical approach (areas, topics, ..)

- Many documents

+ Rich source of knowledge

- Unstable set of areas

- Lack of clear metaphor of Informatics

- Controversy about obligatory vs. elective topics

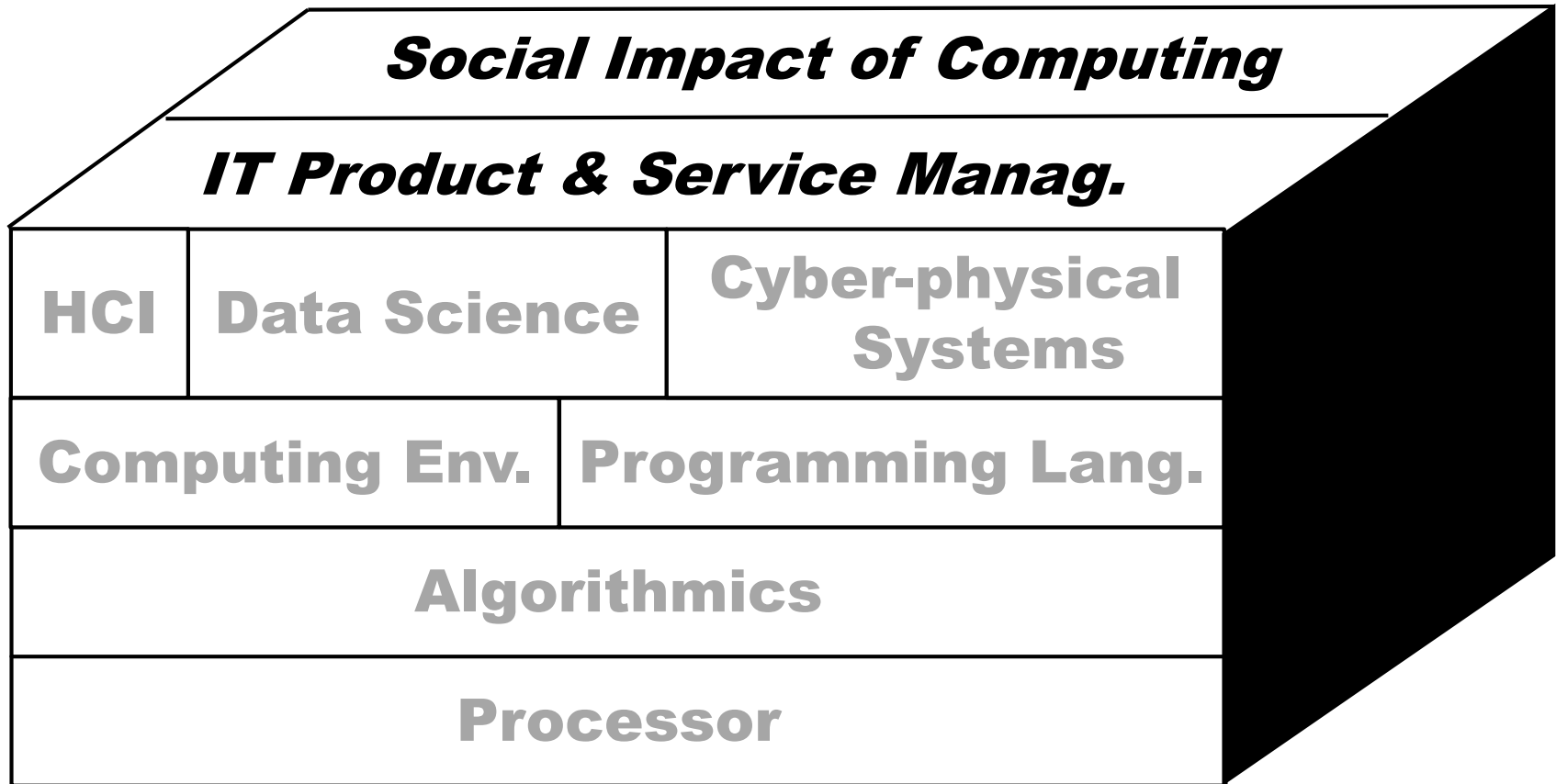


New model of computing areas (Sep. 2017)

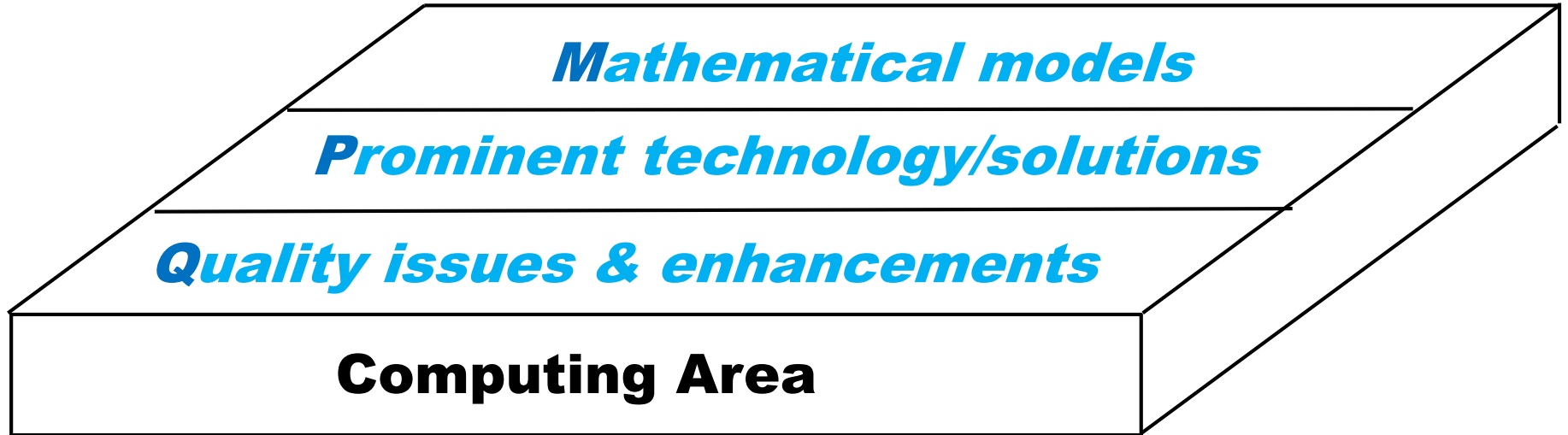
HCI	Data Science	Cyber-physical Systems
Computing Env.		Programming Lang.
Algorithmics		
Processor		



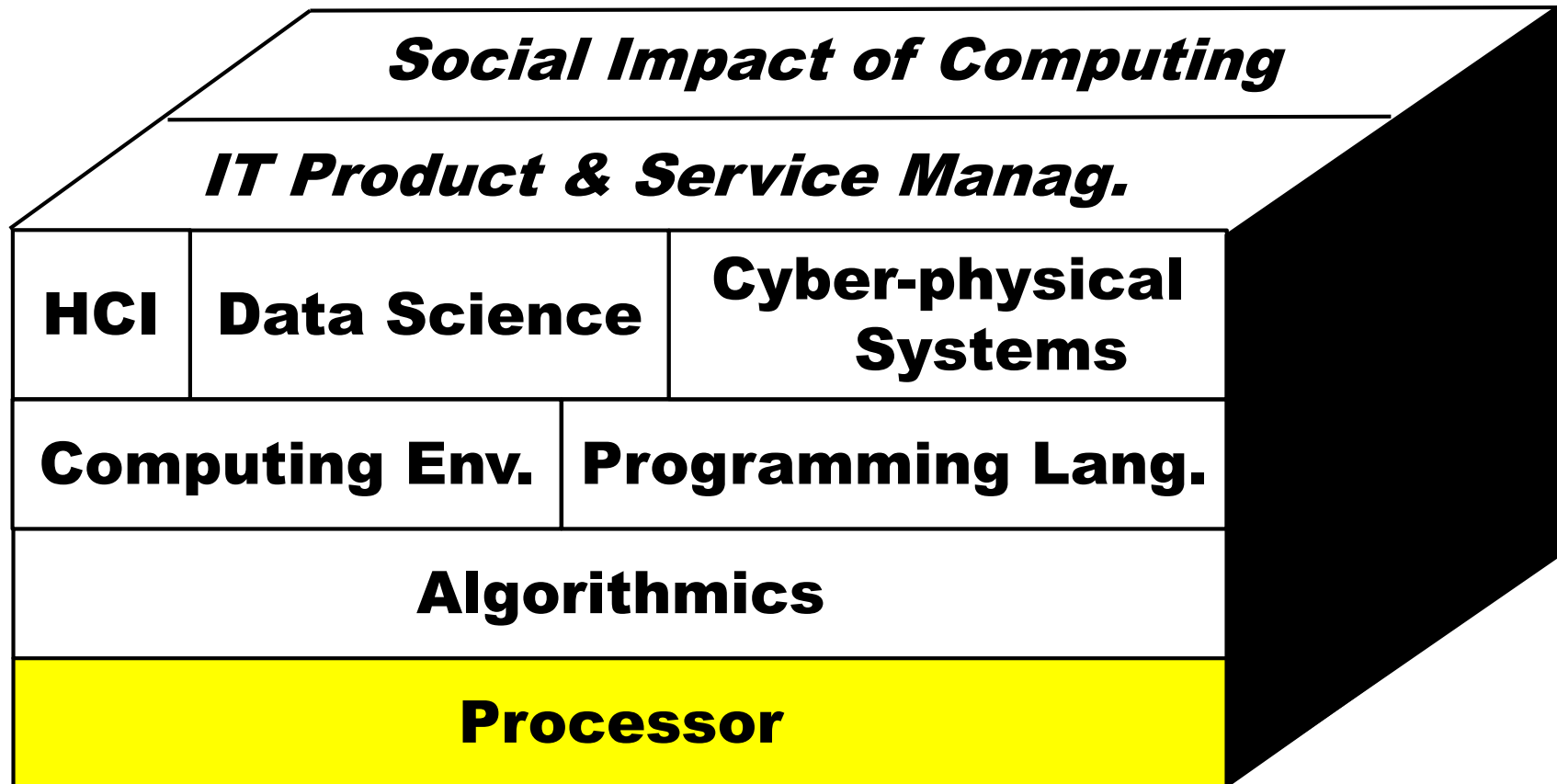
New expanded model of computing areas (Sep. 2017)



Aspects of each computing area



2-dimensional model of computing areas



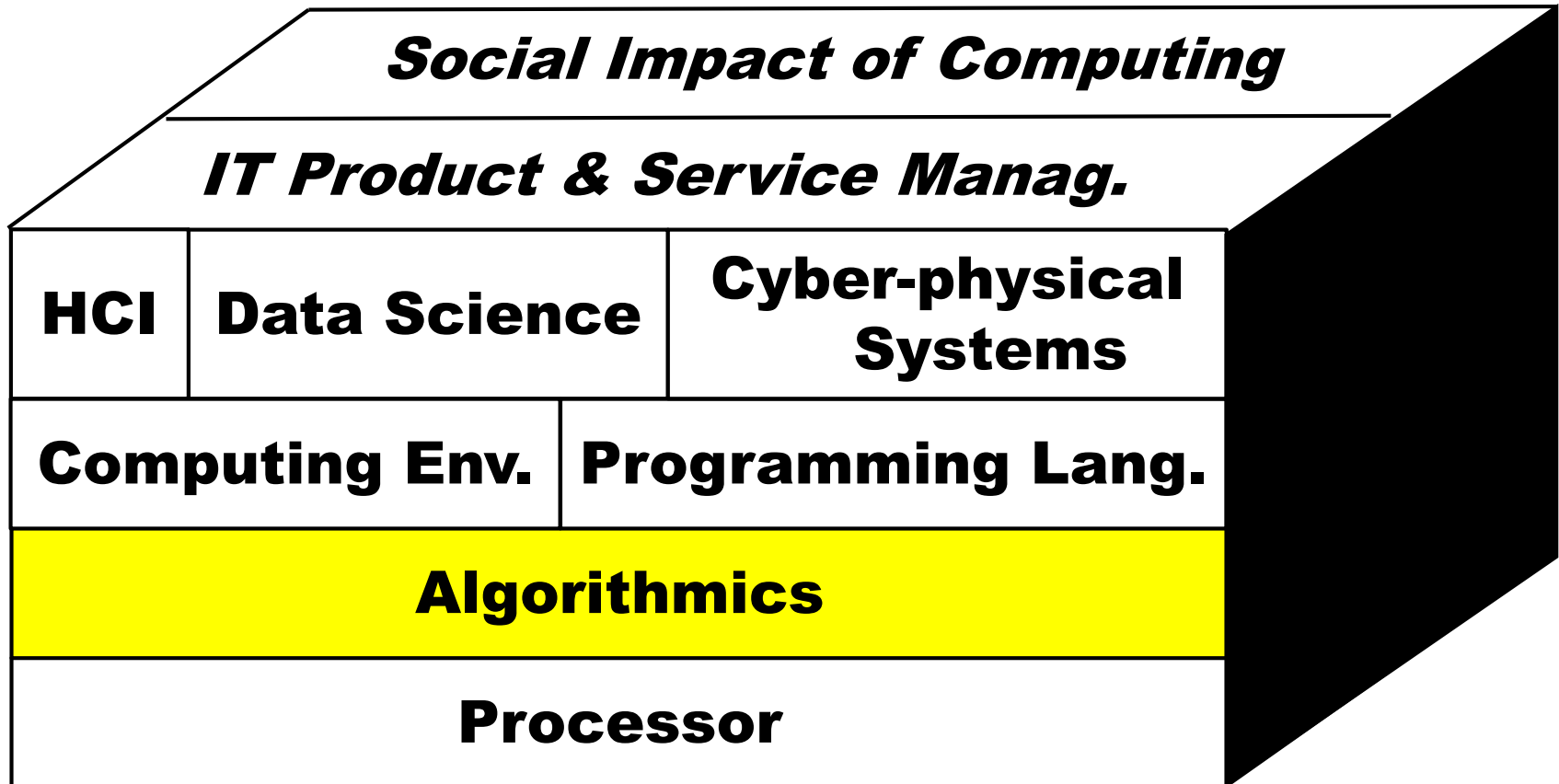
- **Classical processor**
- **Parallel architectures**
- **Non-standard computing machinery**
- **M: Finite state automata (determ./indeterm)**
- **M: Quantum gates**
- **Q: Processing speed, reliability/testability, energy/power issues**
- **P: TTL technology, Intel microprocessors, memory chips, VHDL**



- **Neural networks**
- **Quantum computer**
- **Bio-chemical computing**



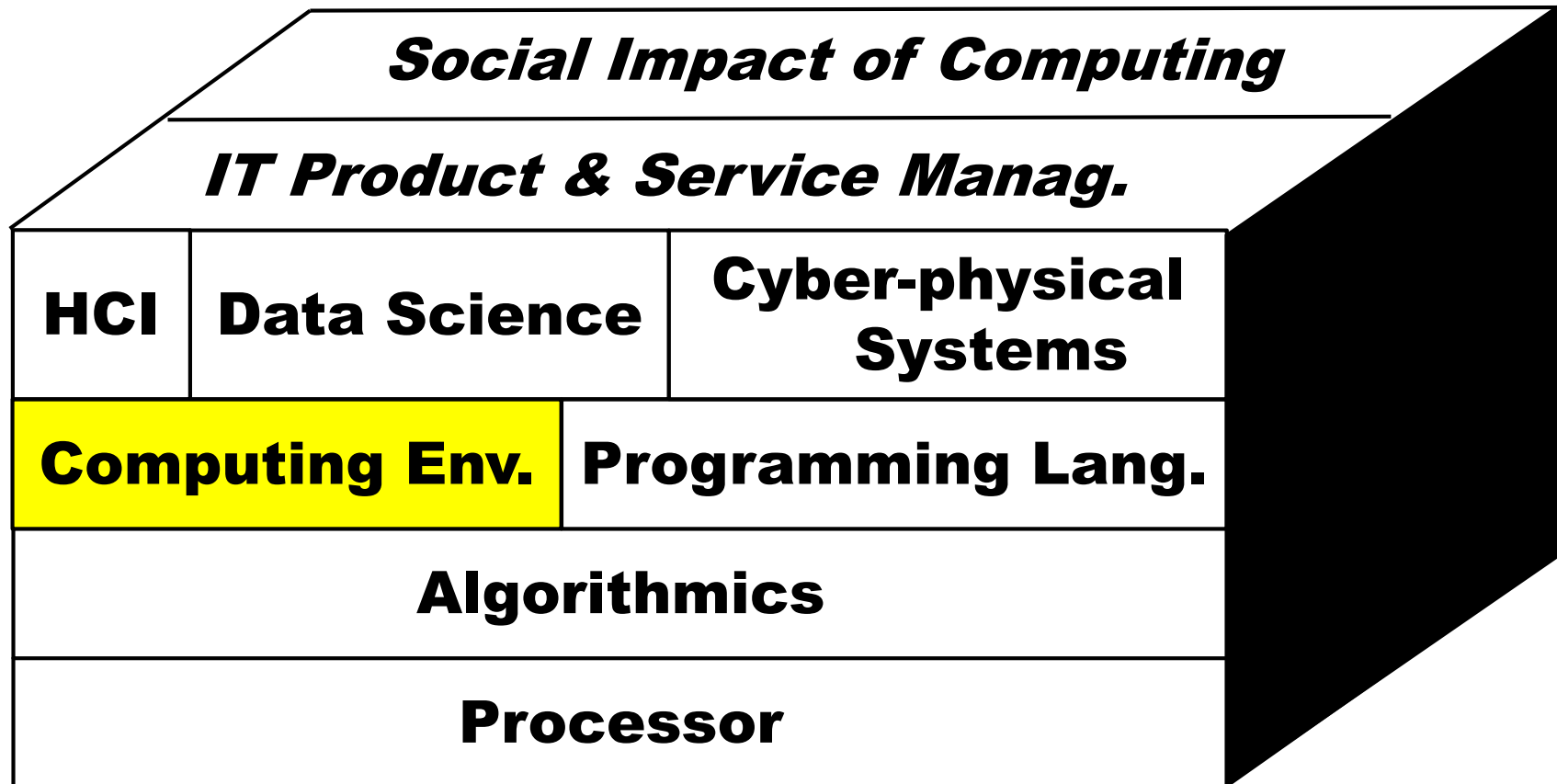
2-dimensional model of computing areas



- **Algorithmic strategies**
- **M: Computability and intractability**
- **P: Fundamental data structures and algorithms**
- **Q: Analysis of algorithms and problems**



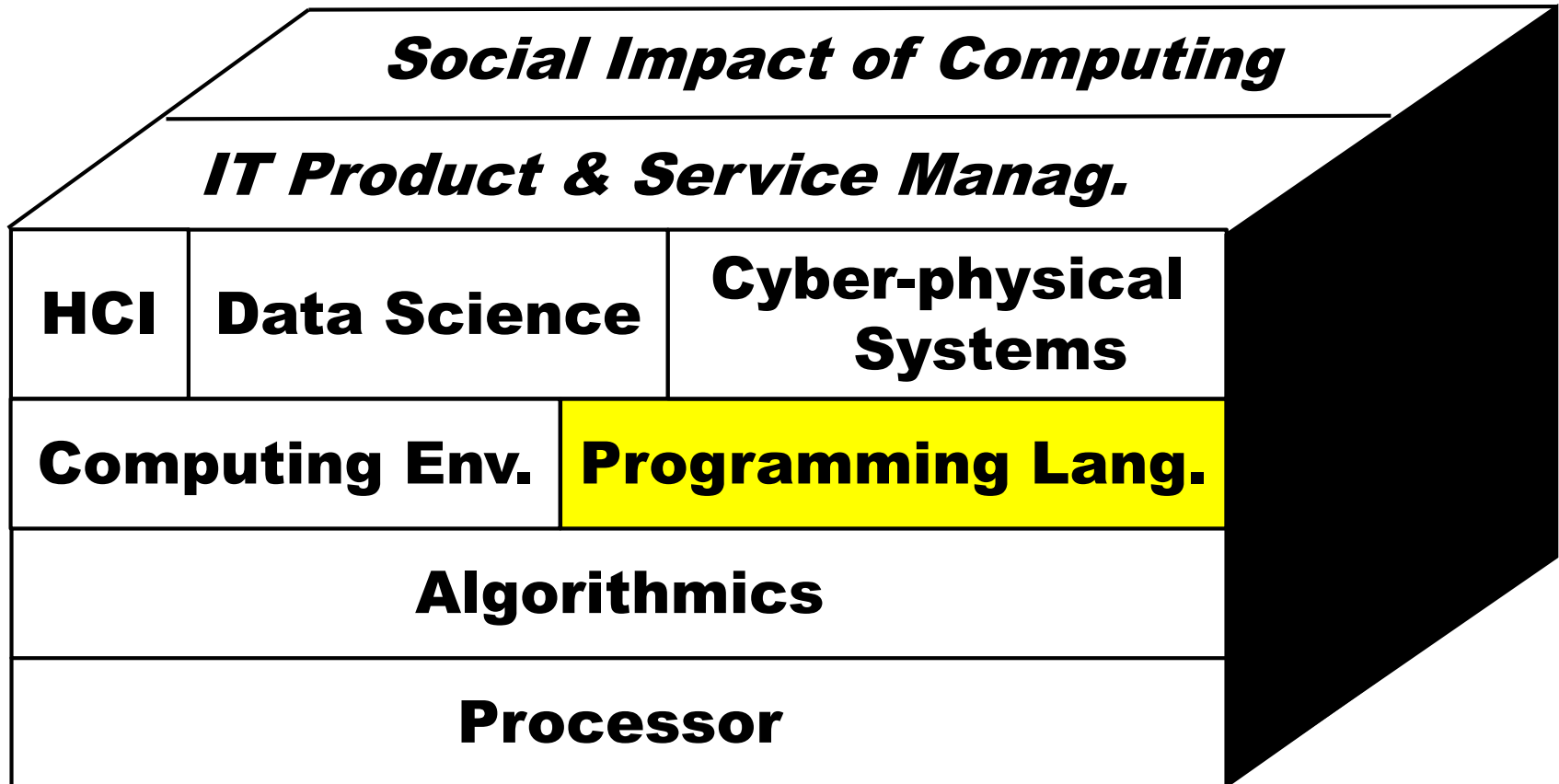
2-dimensional model of computing areas



- **Virtual machines (operating systems)**
- **Computer networks**
- **Cryptography and privacy protection**
- **Distributed systems**



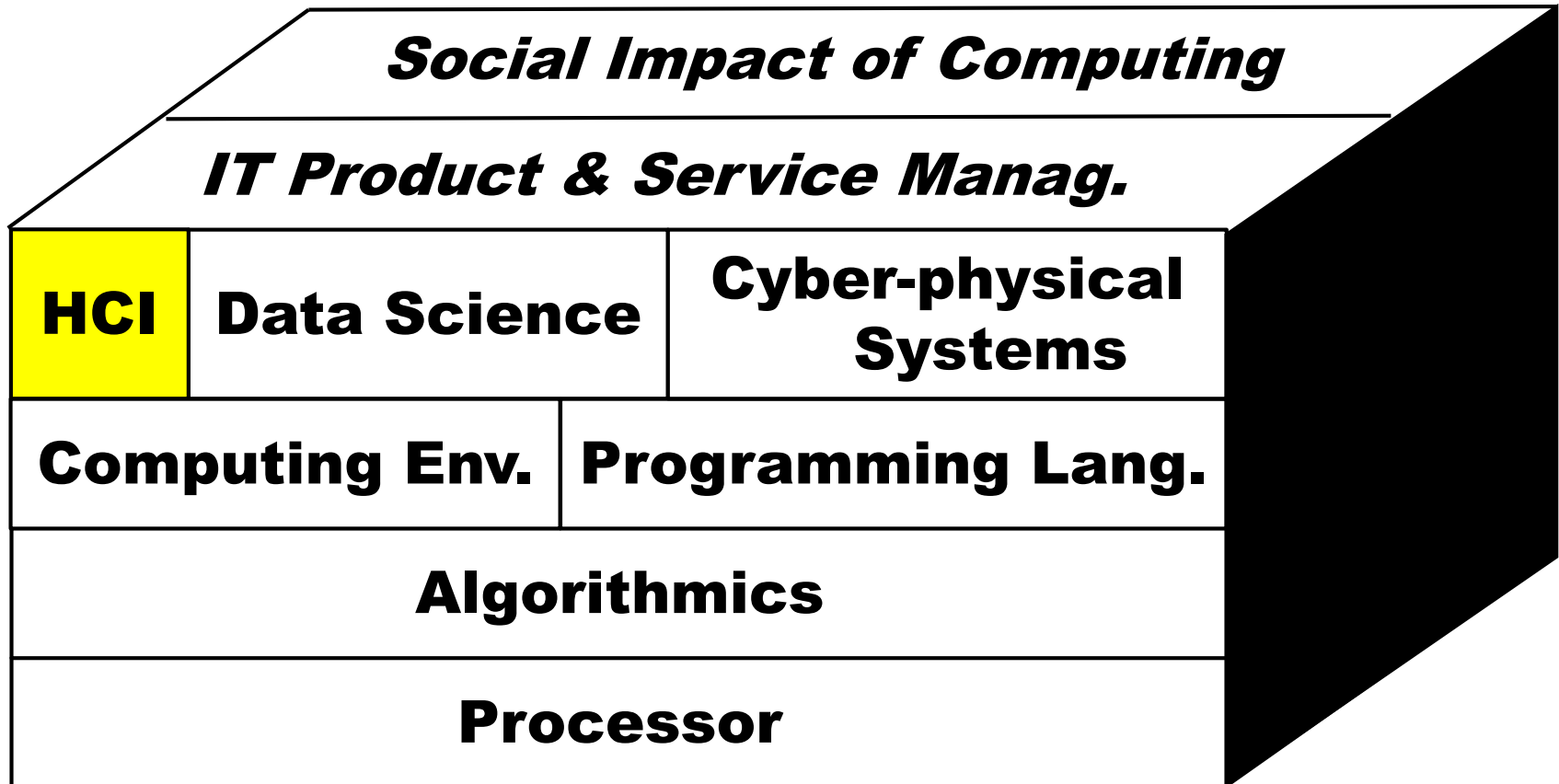
2-dimensional model of computing areas



- **Programming paradigms and language design**
- **Language definition**
- **Language implementation**
- **Program specification and verification**
- **Program analysis and synthesis**



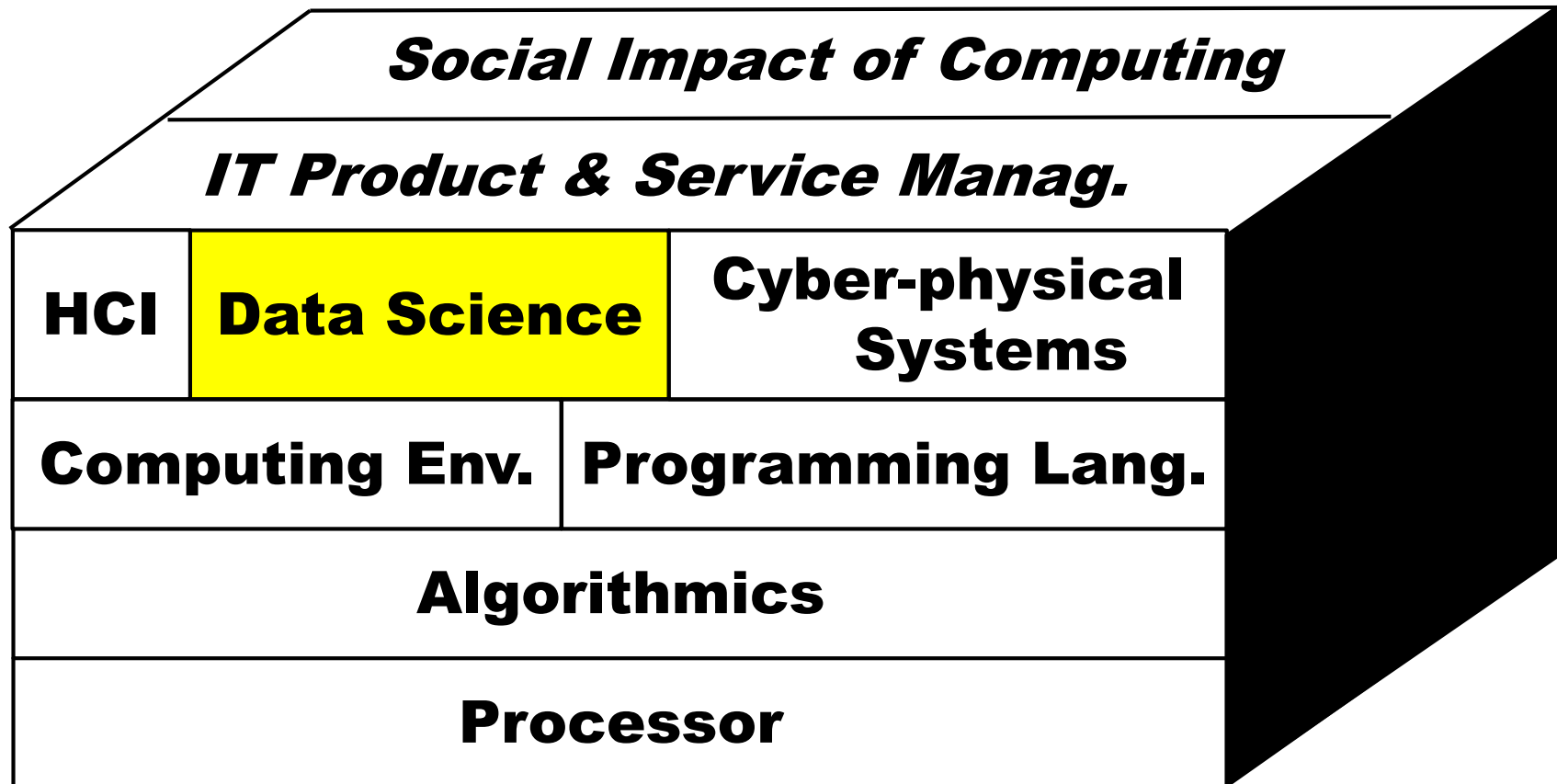
2-dimensional model of computing areas



- **Image analysis**
- **Image generation**
- **Written language analysis and generation**
- **Oral language analysis and generation**
- **Virtual and augmented reality**



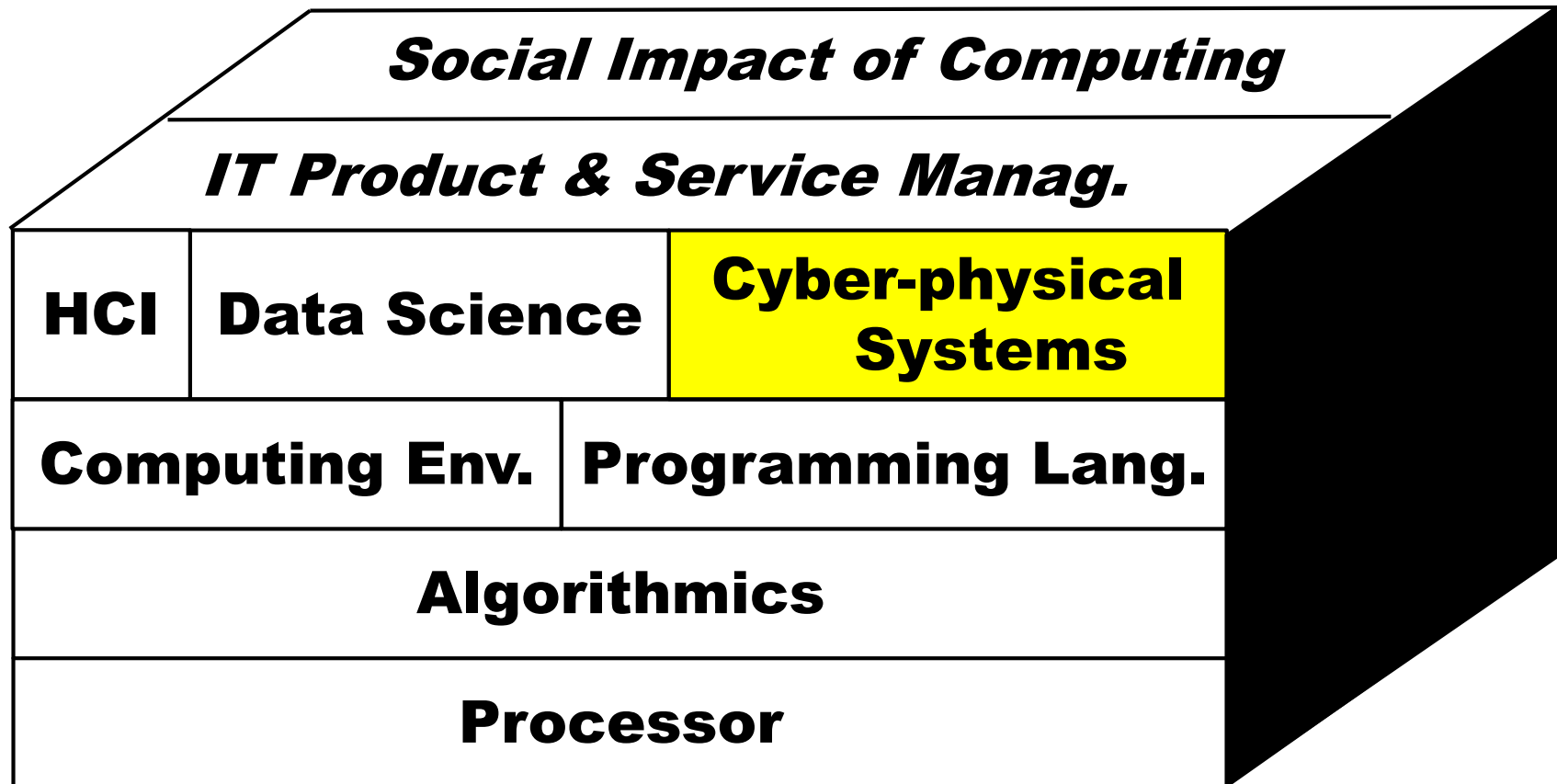
2-dimensional model of computing areas



- **Statistical methods in data analysis**
- **Machine learning**
- **Knowledge representation**
- **Inference**
- **Multi-criteria optimization**
- **Preference models**



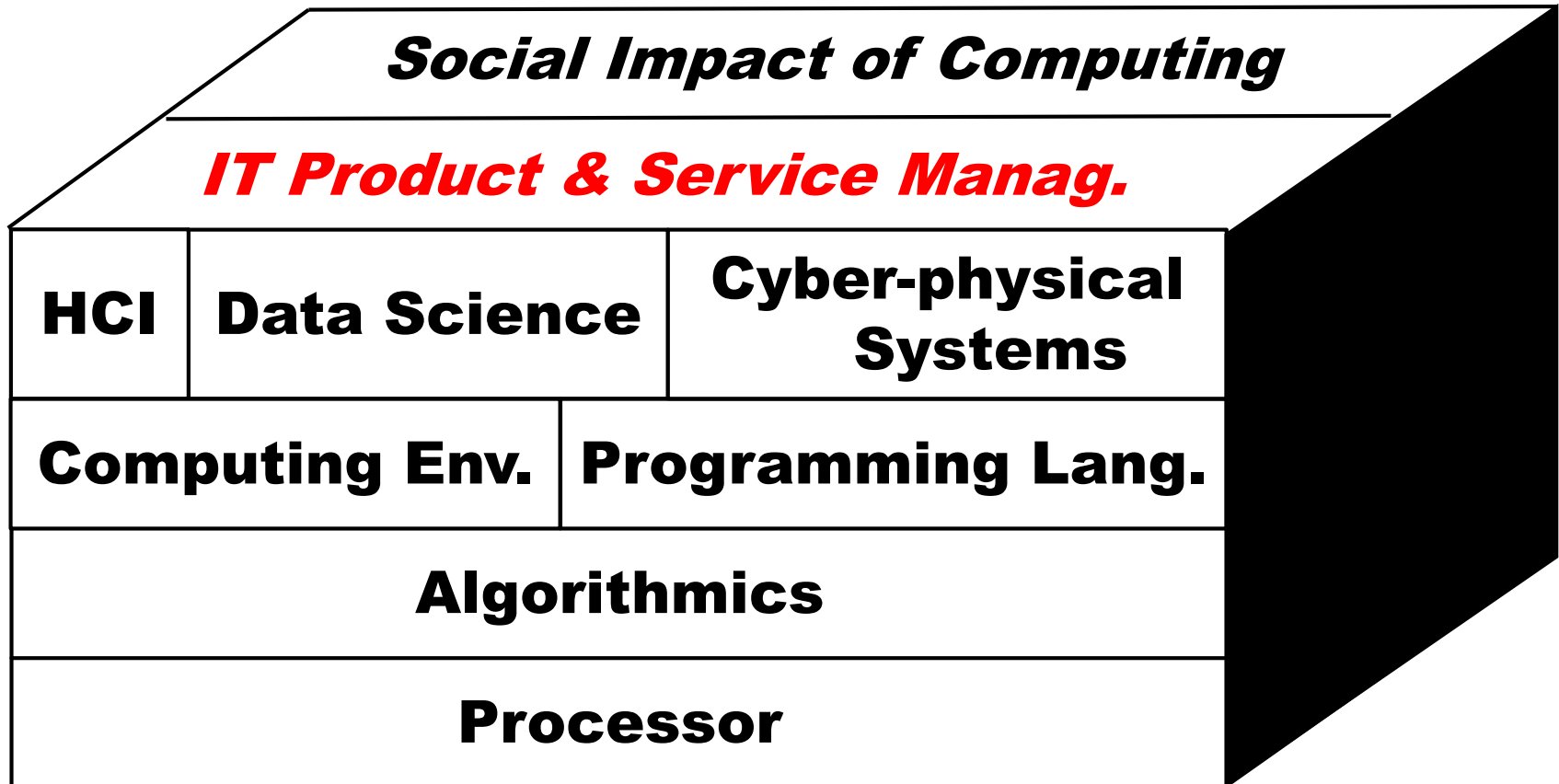
2-dimensional model of computing areas



- **Interfacing with sensors and actuators**
- **Real-time systems (incl. real-time networks, hard-real-time scheduling)**
- **Technical risk management (incl. HAZOP, FTA, reliability models)**



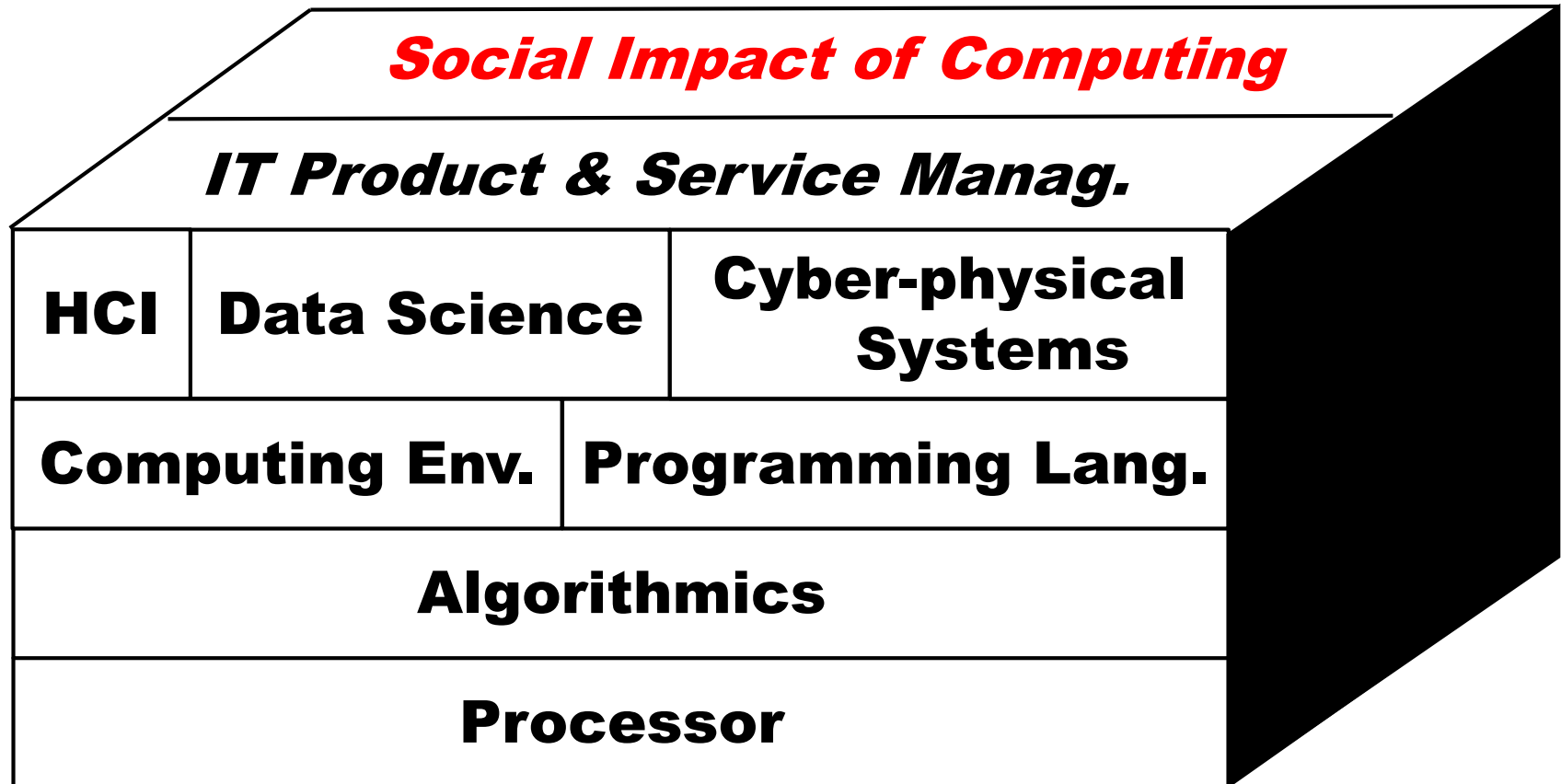
2-dimensional model of computing areas



- **Service management (inlc. ITIL)**
- **Cybersecurity**
- **IT project management**
- **IT product management**



2-dimensional model of computing areas



- **Cyber crime**
- **Cyber-social networks (incl. fake news, recommender systems, privacy)**
- **Entertainment computing**
- **Autonomous systems (cars, weapon)**
- **Privacy issues**



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Ankieta pilotaż



- 1. W jakiej specjalności aktualnie zatrudnia Pani/Pan pracowników z obszaru ICT?**
- 2. Jakich specjalistów ma Pani/Pan zamiar zatrudnić w najbliższych 3 latach?**
- 3. Jakich Pani/Pana zdaniem umiejętności brakuje absolwentom uczelni na kierunkach ICT?**
- 4. Jaki procent Pani/Pana pracowników zatrudnionych w obszarze ICT ukończyło studia wyższe z zakresu ICT?**
- 5. Czy Pana/Pani firma dofinansowywała kursy kształcące lub studia podyplomowe swoich pracowników z obszaru ICT lub ma zamiar dofinansowywać?**
- 6. Branża Pani/Pana firmy**



- **Programista**
- **Tester oprogramowania**
- **Analityk/projektant systemów**
- **Konfigurator/administrator sieci**
- **Analityk danych**
- **Kierownik projektów**
- **Twórca stron/serwisów WWW**
- **Projektant/programista baz danych**
- **Grafik komputerowy**
- **...**



- **Programistycznych**
- **Analitycznych**
- **Miękkich**
- **Zarządczych**
- **Językowych**
- **Narzędziowych i technicznych**
- **Ekonomicznych/finansowych**



- **Elektronika**
- **Usługi telekomunikacyjne**
- **Usługi cyfrowe**
- **Wytwarzanie oprogramowania**
- **Handel elektroniczny**
- **Integracja systemów**
- **Doradztwo w zakresie ICT**
- **...**



**Dziękujemy za
uwagę!**

Zespół Edukacja cyfrowa

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lub bezpośrednio z członkami Zespołu