Предвидение средне-срочного будущего

(2005-2050)

Данила Медведев
TransVision 2005

План презентации

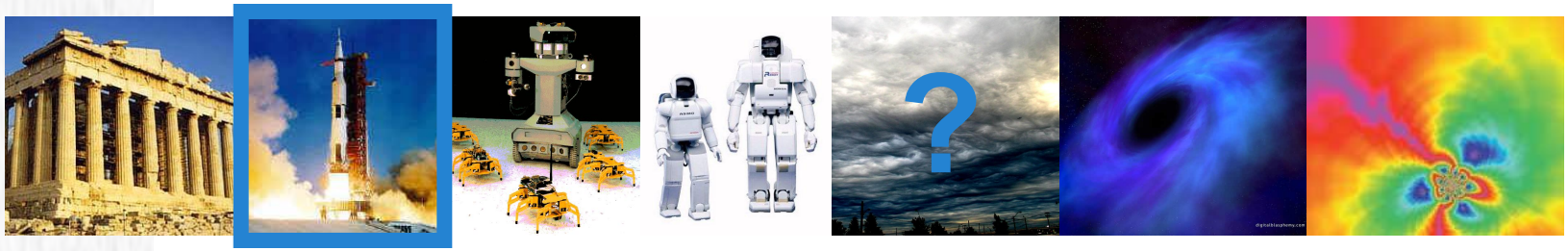
- Зачем?
- Временные периоды
- Как? – существующая система
- Кто? и методологии
- Проблемы размышлений о будущем
- Управление мозаикой: технология
- Социо-экономическое воздействие технологии

Зачем думать о будущем?

- Мы думаем о будущем, потому что:
  - мы по природе **любопытны**
  - это **полезно** (планирование – это естественный элемент нашей жизни, а, чтобы планировать, нам нужно знать будущее)
  - некоторые образы будущего вызывают сильные **эмоции** (страх, волнение), что побуждает нас больше думать о будущем
  - мы приходим к выводу, что будущее будет очень важным/другим и **сознательно** решаем больше о нём думать

Временные периоды

Прошлое | Настоящее | Близкое будущее | Продвинутое будущее | Пре-сингулярность | Сингулярность | Пост-сингулярность

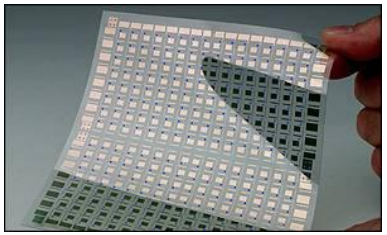


- Эти этапы следует **рассматривать отдельно**, потому что
  - знание о них нам нужно в **разной степени** и
  - по **разным причинам**.

- Загадочное время
  - Пре-сингулярность туманна
  - Пост-сингулярность неопределена

Ближайшее будущее

- Прогнозы на следующее десятилетие активно используются в бизнесе
- Будущее будет “больше одного и того же”. Экраны больше, звонки дешевле, машины экономичнее.



- There are marginal improvements, although a lot of them are driven by qualitative improvements in underlying technology. Some are even driven by small revolutions in fields such as nanotech, biotech, computing, etc.
- Examples – better textiles, shampoos, drugs, cars, etc.
- People easily accept this, but are not inspired. Early adopters pick up the technology, the rest follows soon.

Продвинутое будущее

- The 2005-2030 stage is well thought out.
- It includes "traditional" technologies with low future shock levels. Life doesn't change radically.
- The forecasts exist within the present-day framework:
  - A democratic society with market capitalism.
  - People remain largely human.
  - Social problems are familiar – many old, some new.
  - The effects of disruptive technologies (AI, immortality, intelligent robots, uploading, abundance society) are not felt yet.
- It looks right to people, because it is familiar and corresponds with present trends well. But it's wrong.

Пре-сингулярность

- Pre-singularity time is the most important because of asymptotic exponential growth!

Industrial (1815)

Computer (1963)

Biotech (1990)

AI (2030)

Atomic (1945)

Human changes (2010)

Nano (2020)

Space (1957)

Robotics (2000)

- Many eras are squeezed in a few decades!
- The results determine the singularity.

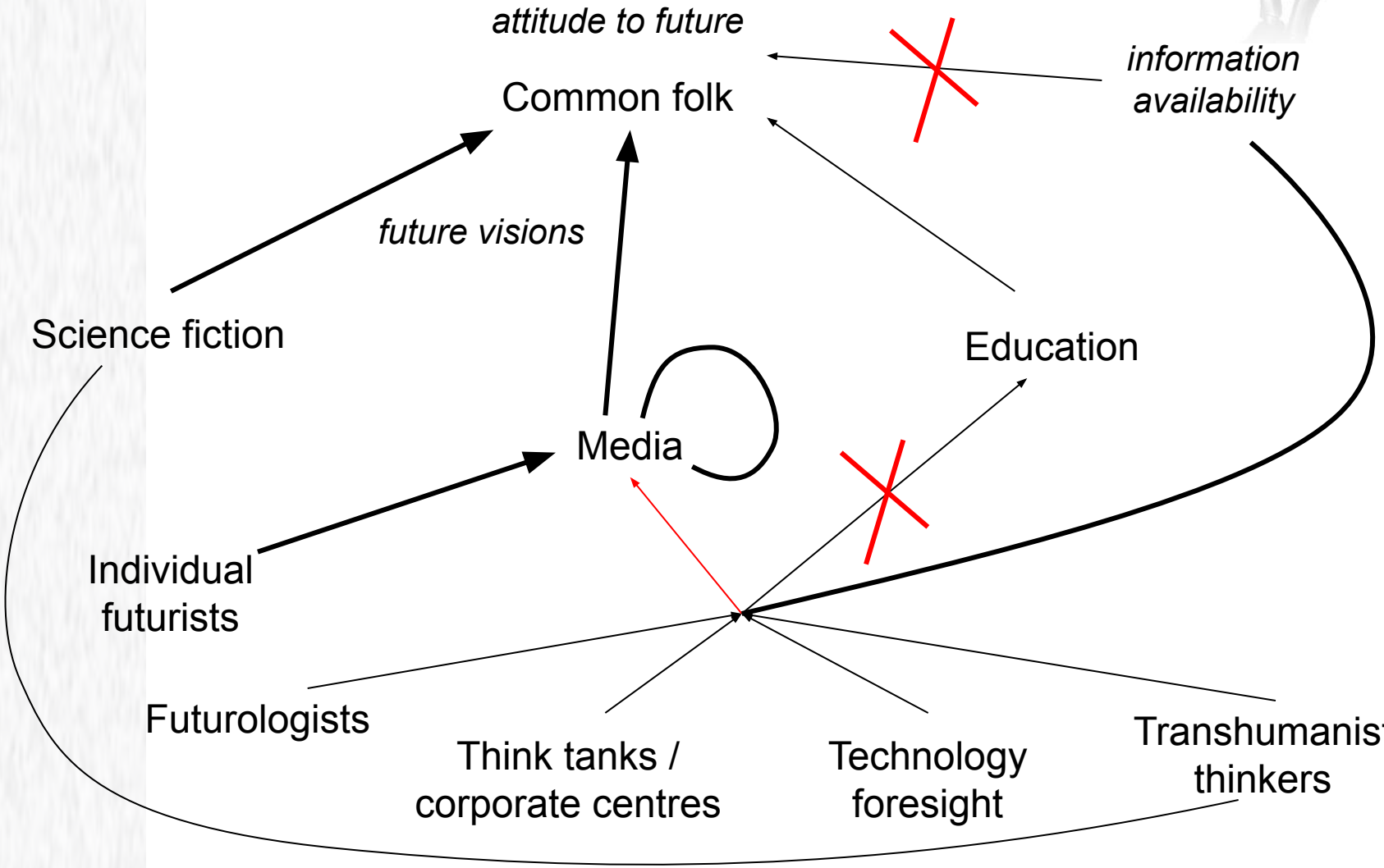
Сингулярность

- Singularity – the most reasonable scenario so far
- In a nutshell:
  - Nanotech + AI = Singularity
- Studying the Singularity (Mitchell Porter):
  - scenarios -> assumptions -> scenario matrix
- Rationally understood, emotionally alien
  - “A worldwide, distributed reasoning system in which there are [billions] of nodes, many of superhuman power. Some will have knowable identity -- say the ones that are currently separated by low bandwidth links from the rest -- but these separations are constantly changing, as are the identities themselves.”

Имеющиеся прогнозы

Временные периоды	Кто?	Точность
Ближайшее будущее	Футурологи, корпоративные центры, мозговые тресты	Достаточная
Продвинутое будущее	Технологическое предвидение, футурологи	Некоторая (ТП)
Пре-сингулярность	Некоторые фантасты	Очень низкая
Сингулярность	Трансгуманисты	ОК
Пост-сингулярность	«Сингулярщики»	Некоторая

Распространение идей



Доступность информации

- All the information is available to everybody
  - fundamental science (textbooks, Internet)
  - news about progress (Internet, TV, press)
  - even the visions and predictions (Internet, books)

- The problems are
  - underexposure

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"*I want unlimited scientific discovery, and I want unlimited applications... We want to live forever, and we're getting there*."

— Bill Clinton, Millennium evening at the White House (October 1999)

"*I did not have sexual relations with that woman*..."

— Bill Clinton, at the conclusion of a press conference in the White House (January 26, 1998)

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- The problems are
  - underexposure
  - lack of interpretation
  - attitude, lack of motivation

- Media picture:
  - among other sensational stories
  - not detailed enough
  - in separate niches (targeted at those who are already interested)
  - based on “the lowest common denominator of futurism”

Обычные люди

- “We don’t need the future” “Not gonna happen anyway”

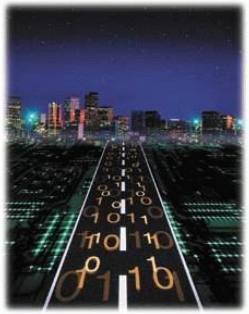
- Ignorance and confidence (from specialists too)
  - Can we assemble an all-dielectric thermally tunable optical filter based on a Fabry–Perot interferometer employing a silicon cavity and silicon based dielectric Bragg reflectors?
  - Can we create human-level AI?
- People presume themselves too much to speak about the future without any qualifications. This, of course, applies to many people here as well, at least in certain areas.

- Attitude towards futurologists: irrational derision ("they get paid for saying crazy baseless things about future" - Pearson, Kurzweil).
- Many people have individual "futuristic ideas“
  - these are not nurtured
  - no outlet for them

Отношение к будущему

- People can be blind to radical changes (they don't care)
- People are scared when told about it (**future shock**)

- The excitement is not really caused by the technology itself, but its **coverage in the media** (memetic ecology).
- Examples:
  - household robots
  - flying cars
  - the information superhighway
- Compare:
  - Mobile phone



Постепенное распространение

1. Access only for rich people. It's seen as a luxury, it's a radical improvement, but it is not inconceivable for an average person from the get go. No strong reaction.
2. Gradual dissemination. People don't make a conscious decision to make the transition to tech-enabled state. They just gradually adopt the new tech. No excitement, only on the personal level.
3. Social changes. People are annoyed by bad things, ignore the good things. Not much excitement. Some claim they can't live without it, but that doesn't translate into a large scale reaction.
4. Wise people comment on the changes. They write about radically new applications – flashmobs, mobloging, always connected lifestyle. These are really important and real changes. But most people don't care one way or another.
5. The technology is adopted. That's it.

- At no point is there particular excitement about the technology.

Образы будущего

- Generic “more of the same” somewhat better future
- Distopian “life will still suck” visions (atomised individuals, western capitalism, environmental degradation, totalitarianism, world war)
- Utopian visions (communism)
- Transhumanist optimism (synergetic view based on nano and AI)

- Differences, because:
  - not everyone knows
  - not all understand the synergy

- Without knowing, the visions are biased on **beliefs** and **ideological preferences**
- The visions are heavily influenced by **clichés** about the future
- Psychological state also plays a role (current **optimism/pessimism** determines the attitude to future)

Кто думает о будущем?

- Научные фантасты
- Футурологи
- Отдельные футуристы
- Корпоративные исследовательские центры
- Мозговые тресты (консультанты)
- Проекты технологического предвидения
- Трансгуманистические мыслители
- «Сингуляритарные» мыслители

Научная фантастика

- Problems:
  - clouded vision (because of Singularity)
  - no coherent pre-Singularity vision
  - most old sci-fi is useless

- Some singulitarian sci-fi
  - Charles Stross, Vernor Vinge, Greg Egan, Damien Broderick, John C. Wright, John Clute, Ken MacLeod, Greg Bear, Chris Moriarty, Kathleen Ann Goonan, Grant Morrison, R. A. Lafferty

Футурология

- Futurology tackles risks, not promises of the future

- “Establishment” futurology, 1960s – started Delphi and scenarios
- Critical futurology, late 1960s – focus on values and policy
- Futures studies, late 1960s – emphasis on alternative futures
- **Technology foresight**, 1970s – Delphi method
- **Oil crisis**, 1973 – sudden drop in interest towards futurology

- Futurology today
  - In their mind we are still in the 1960s
  - Too much emphasis on current problems
  - Essentially useless, besides the general “progress is good” idea
- Technology foresight
  - Developed methodology
  - UNIDO support, structure, organisation

Исследование будущего, WFS, 2004

Десять главных тенденций

- Ecological footprint growing
- Hope in decline
- New nuclear weapons
- Bird flu
- Response to AIDS
- Surplus males in China and India
- Sustainable forest management
- Workforce trends in US
- Transportation innovation
- Novel futures: rapid growth

Десять главных прогнозов

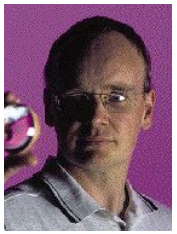
- World population in 2050
- Aging societies
- Greater transparency
- North-south divide
- Al Qaeda's next attack
- Al Qaeda's long-term program
- Global fascism ahead?
- Fiber farms
- Impact of “No Child Left Behind”
- Monster quake in Midwest?

- **Необычайно недальновидные прогнозы, полностью бесполезные в долгосрочной перспективе**

Отдельные футуристы

- These pop-futurologists regularly get into public spotlight
- Their isolated statements play an overly important role, because people are not exposed enough to the future

- Примеры
  - Фрэнсис Фукуяма
  - Элвин Тоффлер
  - Билл Джой (Sun)
  - Ян Пирсон (British Telecom)



- Проблемы:
  - wildly diverging visions with no system behind them
  - influenced by strong personal beliefs and worldviews

Корпоративные центры, мозговые тресты

- Many companies carry out unsystematic attempts to predict the short-term future (5 years) in their field
- Some companies have internal futurology units
  - British Telecom: Foresight and Futurology Unit
  - Swiss Re: Centre for Global Dialogue
- But most of them are worthless…

- No system, just a mishmash of random predictions

- Think tanks
  - are paid real money for their results, so they usually have to stay competitive
  - but they can't spread the results widely and freely
  - the better ones (e.g. Social Technologies) use technology foresight

BT Exact Technologies

- Some of the predictions:
  - Virtual retinal displays, glasses based
  - Fully automatic ships able to navigate and dock automatically
  - ANT based network management
  - Private space mission to examine asteroid with a view to space mining
  - Global electronic currency in use
  - Crime and terrorism mainly computer based
  - Fractal shape-changing robots
  - Plane zorbing, jumping out of planes in inflatables
  - Cheap miniature cameras cause social backlash
  - Fibre optic plants in gardens

- Target year: 2005
- Predictions made: November 2001
- Accuracy for 2005: about 10%, mostly the obvious ones

Технологическое предвидение

- Технологическое предвидение было создано для выявления «зарождающихся» технологий
  - 1960 – методология (Дельфи) разработана RAND
  - 1970 – Япония
  - 1971 – Советский Союз
  - начало 1980-х – социалистическая Франция
  - с тех пор – 20-30 стран
- Преимущества:
  - детальная методология
  - конкретные предсказания
  - научный подход
- Поддерживается ЮНИДО и многими правительствами
- Распространение результатов является важной частью методологии

Предсказания NISTEP

- Примеры из отчётов 1971, 1976 и 1981 годов:
  - *Частичная возможность* работать из дома с помощью использования ТВ, телефонов, факсов и т. п. (прогноз: 1998)
  - Получение данных от беспилотных зондов о Уране, Нептуне, Плутоне и вне Солнечной системы. (1999)
  - *Разработка* оптической коммуникационной технологии, позволяющей резко сократить потребность в меди. (1999)
  - *Возможность* искусственного оплодотворения или искусственная матка. (2001)
  - *Широкое использование* пересадки сердца человеку, благодаря решению проблем имунной реакции отторжения. (2001)
  - *Практическое использование* высокоскоростных (300 км/ч) железных дорог на железных рельсах и колёсах. (2006)
  - *Разработка* искусственного уха. (2007)
- Процент полной и частичной реализации предсказаний трёх прогнозов составил **64%–71%**
- **Конкретные**, полезные и относительно **точные** предсказания

Трансгуманисты

- Ideas mainly spread through books (including sci-fi)
  - It’s the only commercially supported venue
- Societal demand for transhumanist ideas is low
  - FutureTAG (UK) – any results?
- Contacts with futurologists are rare
  - FTA meeting in October 2004 (Helsinki)
- Do individual transhumanist visions combine into a single picture? Or are they separate, disjointed and contradictory?
- Can we build a timeline relatively consistent with all the individual views?

Что мешает предсказаниям?

- Personal biases
  - Knowledge only in a narrow domain
  - **Horizon problem** – ability to predict short-term only
  - Futurologists who are interested in social aspects, don't know technology well enough to base their predictions on firm ground
  - **Future shock** – emotional reaction towards radical changes

- Methodological biases
  - **Single factor** vs. multiple factor forecasts
  - Ignoring radical improvements in favor of incremental improvements
  - Overestimating short-term progress and **underestimating long-term progress**

Проблема горизонта

- Люди не способны достаточно далеко заглянуть в будущее даже в своей области
  - Известные примеры: авиация, радио, ТВ
  - 1970-е: горизонт предвидения у исследователей около 7 лет, у маркетологов около 5 лет

Многофакторные прогнозы

- Many forecasts assume that everything, but one variable X stays the same.
  - Technology foresight at least lists all expected changes in one place.
- For better understanding of the future **complex, but coherent** forecasts are essential. These can better describe people's life as opposed to describing technological developments only.

- **"What will my life be like in 2030?"** – where can I find such a forecast?

Шок будущего

- Related - future shock levels problem (not future shock in Toffler's sense). Singularity is one special case of that.
- People can't fathom the future or accept it.

- Future concerns:
- most concerns that people have today are as *irrelevant* as worries about horseshit were 100 years ago.

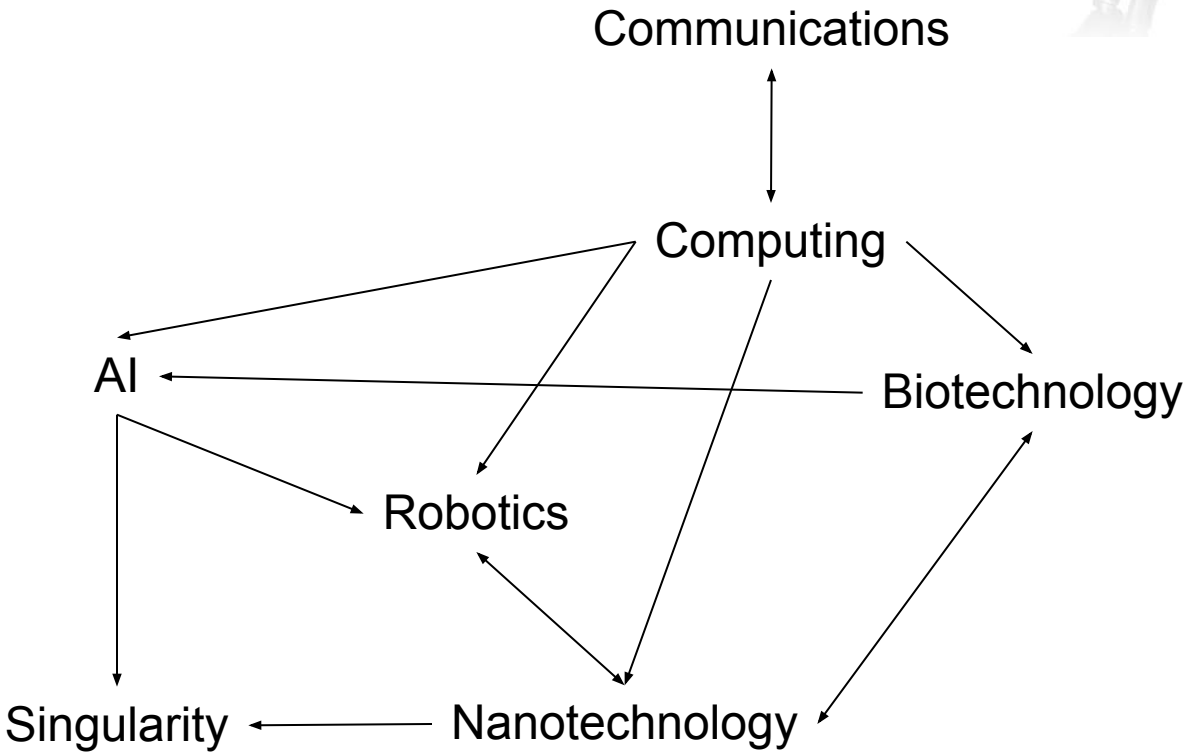
Синергия

- "*Moreover, future technology trends will be marked not only by accelerating advancements in individual technologies but also by a force-multiplying convergence of the technologies—information, biological, materials, and nanotechnologies—that have the potential to revolutionize all dimensions of life. Materials enabled with nanotechnology's sensors and facilitated by information technology will produce myriad devices that will enhance health and alter business practices and models*." (Mapping the Global Future, NIC)

- Synergy also helps:
  - transcede the limitations of technology foresight and notice the looming Singularity
  - paint a complex picture and move to multi factor predictions

- The primary future technologies (nano-, AI, genetics, neuro-, etc.) will together cause the next **metasystem transition**, leading to synergy between individual humans and computers.

Синергия


Communications
Computing
AI
Biotechnology
Robotics
Singularity
Nanotechnology

Сложность и непредсказуемость

- “*An invention acts rather like a trigger because once it's there it changes the way things are and that change stimulates the production of another invention, which in turn causes change an so on*.”
  - Connections – The Trigger Effect

- “*For most people, this Singularity point has already arrived, and the future mix of the ever greater number of ever smarter people and machines will look to them about equally confusing, and just change faster*.”
  - Alexander Chislenko

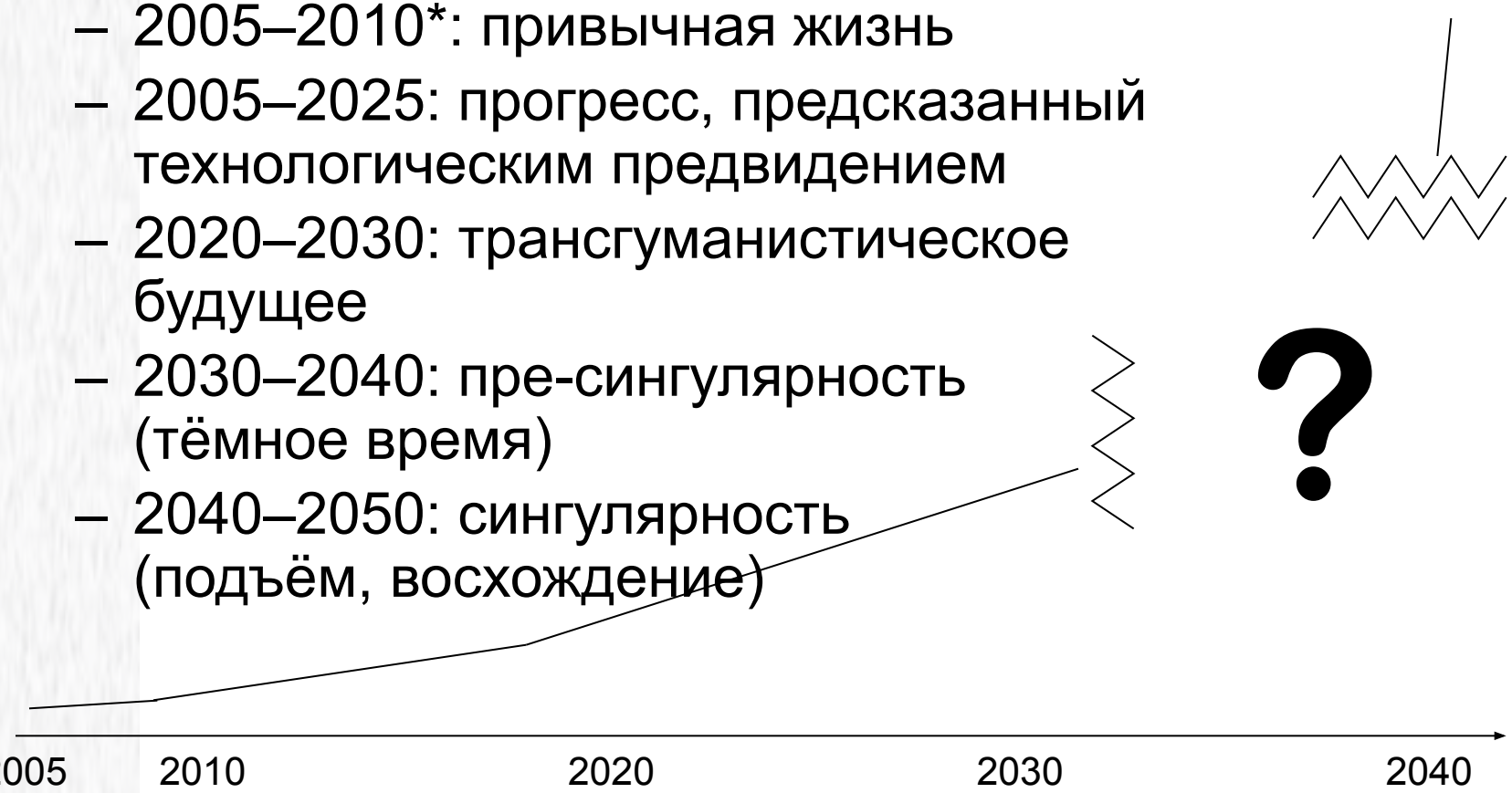
Технологический детерминизм

- Подробная картина будущего может быть построена на базе чётко определённых возможностей (и их пределов), определяемых законами природы, а не на предсказании прогресса

- “Последние пределы” для некоторых областей технологий:
  - Нанотехнологии – ассемблеры
  - Биология – бессмертие
  - Космос – космические лифты, колонизация планет, космические поселения, путешествия к звёздам
  - ИИ – уровень человека и выше
  - Робототехника – полная автоматизация
  - Виртуальная реальность – полный реализм
  - Компьютеры – намного быстрее человеческого мозга, симуляция всего, чего угодно, загрузка
  - Коммуникации – гипервысокоскоростная связь на Земле и не только
- Если что-то действительно полезно, это будет создано

Путь к 2050

- О чём [почти] все [частично] согласны:
  - 2005–2010*: привычная жизнь
  - 2005–2025: прогресс, предсказанный технологическим предвидением
  - 2020–2030: трансгуманистическое будущее
  - 2030–2040: пре-сингулярность (тёмное время)
  - 2040–2050: сингулярность (подъём, восхождение)



* *The years are for illustrative purposes only*

Выводы

- Многие прогнозы упоминают синергетические эффекты, но уходят от анализа их следствий
- Технологическое предвидение совместимо с трансгуманизмом
- Технологическое предвидение работает, хотя проводят его люди «первого уровня шока будущего» (SL1)