

**Küresel Eğilimler 2030:
ALTERNATİF DÜNYALAR RAPORUNA
AKADEMİK BAKIŞ: TEKNOLOJİ**

Doç. Dr. Ahmet KOLTUKSUZ



Küresel Eğilimler 2030

- ✦ Rapor başlıca üç ana bölümden oluşmaktadır.
- ✦ Sırasıyla:
 - Mega Eğilimler (megatrends)
 - Oyun Değiştiriciler (game changers)
 - Potansiyel Dünyalar (potential worlds)



Küresel Eğilimler 2030: Mega Eğilimler

| MEGATRENDS | |
|----------------------------------|--|
| Individual Empowerment | Individual empowerment will accelerate owing to poverty reduction, growth of the global middle class, greater educational attainment, widespread use of new communications and manufacturing technologies, and health-care advances. |
| Diffusion of Power | There will not be any hegemonic power. Power will shift to networks and coalitions in a multipolar world. |
| Demographic Patterns | The demographic arc of instability will narrow. Economic growth might decline in "aging" countries. Sixty percent of the world's population will live in urbanized areas; migration will increase. |
| Food, Water, Energy Nexus | Demand for these resources will grow substantially owing to an increase in the global population. Tackling problems pertaining to one commodity will be linked to supply and demand for the others. |

Küresel Eğilimler 2030: Oyun Değiştiriciler

| GAME-CHANGERS | |
|--|--|
| Crisis-Prone Global Economy | Will global volatility and imbalances among players with different economic interests result in collapse? Or will greater multipolarity lead to increased resiliency in the global economic order? |
| Governance Gap | Will governments and institutions be able to adapt fast enough to harness change instead of being overwhelmed by it? |
| Potential for Increased Conflict | Will rapid changes and shifts in power lead to more intrastate and interstate conflicts? |
| Wider Scope of Regional Instability | Will regional instability, especially in the Middle East and South Asia, spill over and create global insecurity? |
| Impact of New Technologies | Will technological breakthroughs be developed in time to boost economic productivity and solve the problems caused by a growing world population, rapid urbanization, and climate change? |
| Role of the United States | Will the US be able to work with new partners to reinvent the international system? |

Küresel Eğilimler 2030: Potansiyel Dünyalar

| POTENTIAL WORLDS | |
|-------------------------------|--|
| Stalled Engines | In the most plausible worst-case scenario, the risks of interstate conflict increase. The US draws inward and globalization stalls. |
| Fusion | In the most plausible best-case outcome, China and the US collaborate on a range of issues, leading to broader global cooperation. |
| Gini-Out-of-the-Bottle | Inequalities explode as some countries become big winners and others fail. Inequalities within countries increase social tensions. Without completely disengaging, the US is no longer the "global policeman." |
| Nonstate World | Driven by new technologies, nonstate actors take the lead in confronting global challenges. |

Ayrıntılı Bakış 1: Mega Eğilimler - Tektonik Kaymalar

MEGATRENDS

Wider Access to Lethal and Disruptive Technologies

A wider spectrum of instruments of war—especially precision-strike capabilities, cyber instruments, and bioterror weaponry—will become accessible. Individuals and small groups will have the capability to perpetrate large-scale violence and disruption—a capability formerly the monopoly of states.

Ayrıntılı Bakış 2: Oyun Deęiřtiriciler, Yeni Teknolojilerin Etkisi

| GAME-CHANGERS | |
|----------------------------|---|
| Impact of New Technologies | Will technological breakthroughs be developed in time to boost economic productivity and solve the problems caused by a growing world population, rapid urbanization, and climate change? |

✦ Üç temel başlık altında incelenmektedir

1. Bilgi Teknolojileri
2. Otomasyon ve Üretim Teknolojileri
3. Kaynaklar ve Sağlık Teknolojileri

Meraklisina Notlar: Big Data = Devasa Veri

| Büyükük | Kısaltma | 10 tabanı | 2 tabanı |
|---------------------------------------|----------|-----------|----------|
| Kilo Byte (1KB = 1024 harf) | KB | 10^3 | 2^{10} |
| Mega Byte | MB | 10^6 | 2^{20} |
| Giga Byte | GB | 10^9 | 2^{30} |
| Tera Byte | TB | 10^{12} | 2^{40} |
| Peta Byte | PB | 10^{15} | 2^{50} |
| Exa Byte | EB | 10^{18} | 2^{60} |
| Zetta Byte | ZB | 10^{21} | 2^{70} |
| Yotta Byte | YB | 10^{24} | 2^{80} |
| ???? | ??B | $10^{??}$ | 2^{10} |

INFORMATION TECHNOLOGIES

| Technology Focus | Current Status | Potential for 2030 | Issues | Impact |
|--------------------------------|--|---|---|--|
| Data Solutions | Large data sorting and analysis is applied in various large industries, but the quantity of data accumulating is outstripping the ability of systems to leverage it efficiently. | As software and hardware developments continue, new solutions will emerge to allow considerably more data to be collected, analyzed and acted on. | The greatest areas of uncertainty are the speed with which big data can be usefully and securely utilized by organizations. | Opportunities for commercial organizations and governments to "know" their customers better will increase. These customers may object to the collection of so much data. |
| Social Networking | Large numbers of people have embraced social networking and found innovative uses of the networks. | Social networks will evolve as new uses are found. | Service providers must find successful business models to support their growth. Network users have to make tradeoffs between privacy and utility. | Social networks enable both useful and dangerous communications across diverse user groups and geopolitical boundaries. |
| Smart City Technologies | The IT components of a smart city are today poorly integrated and not very efficient. | New and developing cities will have installed semi-integrated IT infrastructures to sustain the myriad of services they provide. | Only an integrated system can maximize the full value of smart city visions. The scale, complexity and high costs of implementing such a system may be too expensive for most cities. | Gains are huge in terms of improved quality of life, increased commercial activity, and lower resource consumption. |

AUTOMATION AND MANUFACTURING TECHNOLOGIES

| Technology Focus | Current Status | Potential for 2030 | Issues | Impact |
|---|--|--|--|---|
| Robotics | Robotics is already in wide use in defense and manufacturing. | Robotics will eliminate human labor in some applications. Blurring between industrial and service robots will occur. | Researchers must reduce the cost of robots and improve their intelligence. As robots spread they will face much greater public scrutiny. | Total automation may become more cost effective than using large levels of labor or outsourcing to developing countries. |
| Remote and Autonomous Vehicles | Remote and autonomous vehicles are in use in defense and mining and exploration. | UAVs will routinely monitor intrastate and interstate conflicts, enforce no-fly zones and survey national borders. | Ensuring autonomous vehicles operate safely and reliably in populated areas will be crucial. | Increased disruption is possible from terrorists' use of UAVs. |
| Additive Manufacturing/3D Printing | Additive manufacturing is in use for creating models and for rapid prototyping in the automotive and aerospace industries. | Additive manufacturing begins to replace some conventional mass-produced products, especially high value products. | Material quality and cost are the limiting factors for the acceptance of additive manufacturing by industry. | Both advanced and developing economies will benefit from the flexibility, speed, and customization of additive manufacturing. |

RESOURCE AND HEALTH TECHNOLOGIES

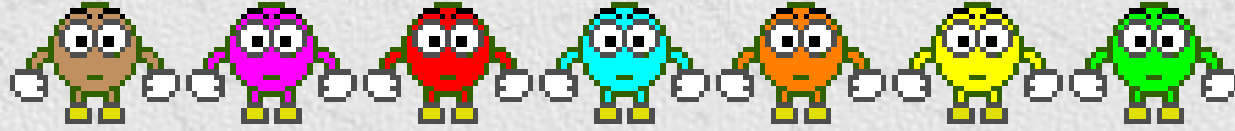
| Technology Focus | Current Status | Potential for 2030 | Issues | Impact |
|------------------------------|---|---|--|---|
| Food and Water | | | | |
| GM Crops | Successful but limited applications are economically successful. | GM crop technology will expand the types of crops able to be modified and the traits able to be transferred to these crops. | Time to market for each transferred trait into each crop is the major hurdle. Many governments have reservations about the safety of GM crops. | GM crop deployments will enable higher yields and address climate-change driven food scarcities. |
| Precision Agriculture | Automation of equipment is suitable only for large-scale farming. | Feasible reductions in scale and price will enable greater application of automated systems and higher yields per hectare. | The cost of equipment and the scalability to small farms is the major barrier. | Major impact will be continued yield and quality improvements for large-scale agricultural operations in developed countries. |
| Water Management | Microirrigation techniques deliver water to roots with 90 efficiency. | Water demand will be high. Cheaper subsurface drip-irrigation together with precision agriculture is likely. Commercial drought-tolerant crops are a possibility. | Microirrigation will be too expensive for widespread use in developing countries. | Insufficient water supplies for residential, industrial and agricultural use will affect a large proportion of the world's population living in water-stressed areas. |

RESOURCE AND HEALTH TECHNOLOGIES

| Technology Focus | Current Status | Potential for 2030 | Issues | Impact |
|-------------------------|--|---|---|--|
| Energy | | | | |
| Bio-Based Energy | Technology of delivering energy from non-food biomass is proven but non-competitive. | Non-food biomass will be a growing alternative source for energy and chemical feedstocks. | Widespread deployment depends on government policies. | If cost-competitive, the technology would provide a useful alternative to fossil fuels. |
| Solar Energy | Photovoltaics has substantial growth potential, but has its limitations. | Advances in photovoltaics, storage technologies, and smart grid solutions needed for solar to be competitive with carbon-sourced energy production. | Research focuses on dealing with negative environmental consequences of the technology. | Successful extension of accessible natural gas and oil reserves will stymie arguments for aggressive climate-change mitigation strategies. |

RESOURCE AND HEALTH TECHNOLOGIES

| Technology Focus | Current Status | Potential for 2030 | Issues | Impact |
|---------------------------|--|--|---|---|
| Disease Management | Molecular diagnostics technologies identify some disease predispositions or presence. | Genetic sequencing enables more personalized healthcare. | Costs per individual diagnostic tests must be reduced to enable widespread adoption. | Will lead to increased life quality, life expectancy, and aging societies. |
| Human Augmentation | Contemporary prosthetic limbs and exoskeletons provide limited functionality to users. | Fully functional limb replacements, enhanced eyesight, and hearing augmentations will be widely available. | Improved understanding of human, brain function, and enhanced portable power sources are necessary. | Very high technology costs could limit availability to the well off, professional athletes, and military. |



**Sabır, ilgi ve zamanınıza çok
TEŞEKKÜR EDERİM.**