

GIST OF KURUSHETRA

HEALTH AND NUTRITION



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CHAPTER 1- ROLE OF TRADITIONAL AND INDIGENOUS KNOWLEDGE IN COMBATING MALNUTRITION IN RURAL INDIA

Malnutrition remains a critical issue in rural India, affecting millions despite the availability of diverse food resources. Traditional and indigenous knowledge, deeply rooted in local customs, offers a potential solution through sustainable diets and agricultural practices. This article explores how indigenous knowledge can combat malnutrition by promoting a balanced, culturally relevant, and sustainable food system.

Nutrient-Rich Diets Rooted in Tradition

- **Balanced Nutritional Intake:** Traditional diets often include a rich variety of grains, pulses, vegetables, and fruits, ensuring a balanced intake of proteins, vitamins, and minerals. These diets, based on local biodiversity, inherently promote nutrition.
- **Health Benefits of Indigenous Foods:** Indigenous foods like millets, leafy greens, and native fruits are packed with nutrients. For example, ragi (finger millet) is high in calcium and iron, and moringa leaves are rich in vitamins A and C, essential for immune function.

Food Security Through Sustainable Agricultural Practices

- **Resilient Farming Techniques:** Indigenous agricultural practices, such as crop rotation, mixed farming, and use of organic fertilizers, help maintain soil fertility and ensure long-term food security.
- **Promotion of Indigenous Crops:** Drought-resistant crops like sorghum and millets are well-suited to the local environment, providing food security even in adverse climate conditions.

Cultural Relevance and Acceptance

- **Integration with Local Traditions:** Traditional foods align with local cultures and religious practices, increasing their acceptance. For instance, festival foods often include highly nutritious ingredients, ensuring regular consumption of balanced meals.
- **Preservation of Traditional Knowledge:** Preserving indigenous knowledge ensures the continued use of traditional farming and dietary practices, safeguarding both food security and cultural heritage.

Adaptability to Local Environment

- **Climate-Resilient Food System:** Traditional knowledge is adapted to local environmental conditions, making indigenous crops more resilient to climate variability, crucial in combating malnutrition during droughts and floods.
- **Utilization of Wild Foods:** Wild edibles such as berries, roots, and tubers are nutrient-dense and readily available, often serving as emergency food sources during lean periods.

Sustainable Food Systems and Environmental Stewardship

- **Conservation of Biodiversity:** Indigenous knowledge promotes the cultivation of diverse crops, maintaining agricultural biodiversity and contributing to a more resilient ecosystem.
- **Low Environmental Impact:** Traditional farming methods emphasize sustainability, reducing the need for chemical inputs and lowering the overall environmental footprint of food production.

Health Benefits and Disease Prevention

- **Medicinal Properties of Indigenous Foods:** Many traditional foods also have medicinal properties. For example, turmeric is known for its anti-inflammatory benefits, while gooseberries are high in antioxidants, boosting overall health.
- **Traditional Dietary Practices and Gut Health:** Fermented foods like buttermilk and pickles improve gut health, which is crucial for nutrient absorption and overall wellness.

Empowerment and Gender Roles in Nutrition

- **Women as Custodians of Traditional Knowledge:** Women play a central role in preserving and passing down traditional food knowledge, contributing to household nutrition and food security.

- **Role in Maternal and Child Health:** Women's knowledge of indigenous foods is vital in ensuring proper nutrition during pregnancy and lactation, improving maternal and child health outcomes.

Community-Led Initiatives and Knowledge Sharing

- **Revival of Traditional Foods through Community:** Communities are reviving traditional food systems through collective efforts, such as seed banks and farmer groups, which promote the use of indigenous crops.



- **Knowledge Sharing and Capacity Building:** Workshops and awareness programs are empowering rural populations to rediscover and apply traditional dietary knowledge in combating malnutrition.

Integration with Modern Nutritional Interventions

- **Complementary Role in Government Programs:** Indigenous knowledge can complement modern interventions like the Integrated Child Development Services (ICDS) by incorporating traditional foods into mid-day meals and health programs.
- **Incorporation into Public Health Campaigns:** Public health campaigns can benefit from integrating traditional food knowledge to create culturally relevant, effective nutritional interventions.

Challenges in Incorporating Traditional and Indigenous Knowledge in Combating Malnutrition

- **Erosion of Traditional Knowledge:** The gradual loss of indigenous knowledge due to modernization poses a major challenge.
 - **Solution:** Government and community-led initiatives should focus on documenting and promoting traditional practices, along with integrating them into school curricula and public health campaigns.
- **Lack of Market Access for Indigenous Crops:** Many indigenous crops face market challenges due to limited demand and low economic value.
 - **Solution:** Promoting value chains for these crops through government support, farmer cooperatives, and linking with organic markets can improve their marketability and economic viability.
- **Stigma and Perception of Traditional Foods:** Traditional foods are often viewed as inferior compared to modern processed foods.
 - **Solution:** Public campaigns highlighting the health benefits of indigenous foods can help change these perceptions and increase their consumption.
- **Lack of Integration with Modern Nutrition:** The disconnect between traditional knowledge and modern nutrition science limits the impact of indigenous practices.

- o **Solution:** Greater collaboration between nutritionists, policymakers, and indigenous communities can lead to the incorporation of traditional foods into mainstream nutrition strategies.
- **Climate Change and Environmental Degradation:** Environmental degradation and changing climate conditions threaten the survival of many traditional crops.
 - o **Solution:** Promoting climate-resilient farming practices and crop diversification can mitigate these impacts and ensure the sustainability of indigenous food systems.

Conclusion

Traditional and indigenous knowledge holds immense potential to combat malnutrition in rural India. By integrating these time-tested practices with modern nutrition interventions, we can create a holistic approach to improving food security, nutrition, and sustainability. However, addressing the challenges related to knowledge erosion, market access, and climate change is crucial for harnessing the full potential of this valuable resource.

CHAPTER 2-THE DIGITAL SHIFT IN HEALTHCARE: NAVIGATING TECHNOLOGICAL TRANSFORMATION

The healthcare sector is experiencing a significant transformation, driven by advancements in digital technologies such as **Artificial Intelligence (AI)**, **Big Data**, **Internet of Things (IoT)**, and **cloud computing**.

- **Industry 4.0** has introduced an era of innovation, reshaping traditional healthcare delivery systems and management practices.
- Klaus Schwab's Fourth Industrial Revolution (2016) highlighted how these technologies have the potential to revolutionize healthcare globally, improving efficiency, enhancing patient care, and reducing costs.

Digital Transformation in Healthcare:

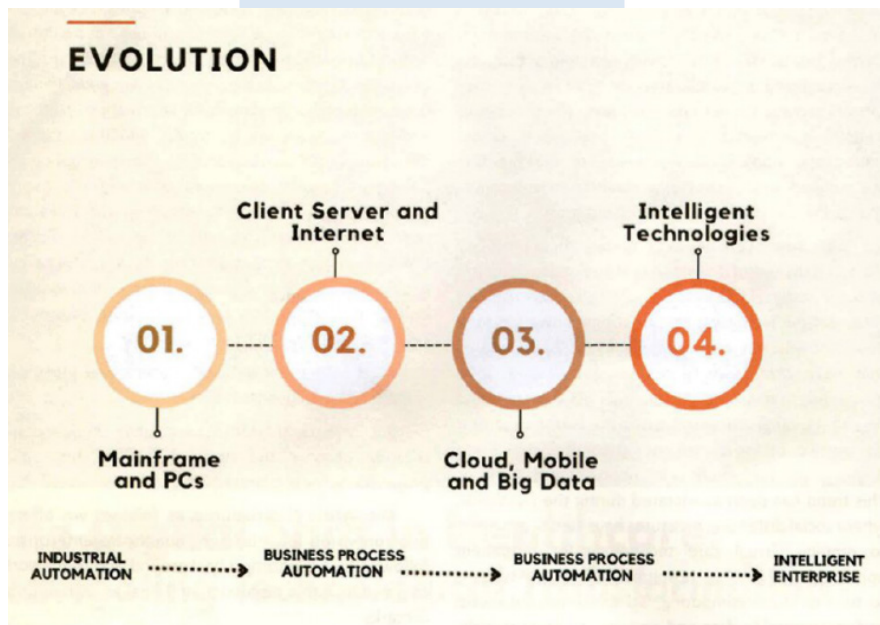


Figure 1: Evolution of Information Technologies from digital era into the intelligence era

- Healthcare has long been one of the most resource-intensive sectors. With rising population demands and increasing health challenges, the need for innovation is greater than ever.
- Digital transformation in healthcare refers to **integrating cutting-edge technologies to create efficient, value-based care systems**.
- In recent years, technological advancements such as **AI and machine learning** have enhanced **diagnostic accuracy, reduced human error, and enabled personalized medicine**.
- Furthermore, **Big Data analytics** has opened new avenues for preventive care by predicting patient outcomes based on large data sets.
- The **COVID-19 pandemic** accelerated the adoption of **telemedicine and virtual healthcare**, making remote consultations and monitoring common practices worldwide.

Key Technologies Shaping the Future of Healthcare

- **Artificial Intelligence (AI):** AI algorithms are revolutionizing diagnostics, automating tasks like radiology scans, and aiding clinical decision-making. AI also plays a crucial role in drug discovery and personalized treatment plans.
- **Big Data:** With the collection of large datasets from Electronic Health Records (EHRs), medical devices, and patient-reported outcomes, Big Data is transforming patient care. Advanced analytics enables healthcare providers to predict disease trends and make data-driven decisions to optimize care.
- **Internet of Things (IoT):** IoT connects medical devices and healthcare systems, allowing real-time monitoring of patients through wearables and sensors. This is especially valuable for managing chronic diseases such as diabetes and hypertension.
- **Telemedicine and Remote Monitoring:** Virtual healthcare systems, supported by telecommunication networks like 5G, have made healthcare accessible to rural and remote areas. Patients can consult doctors from their homes, reducing the need for in-person visits and easing the burden on healthcare infrastructure.

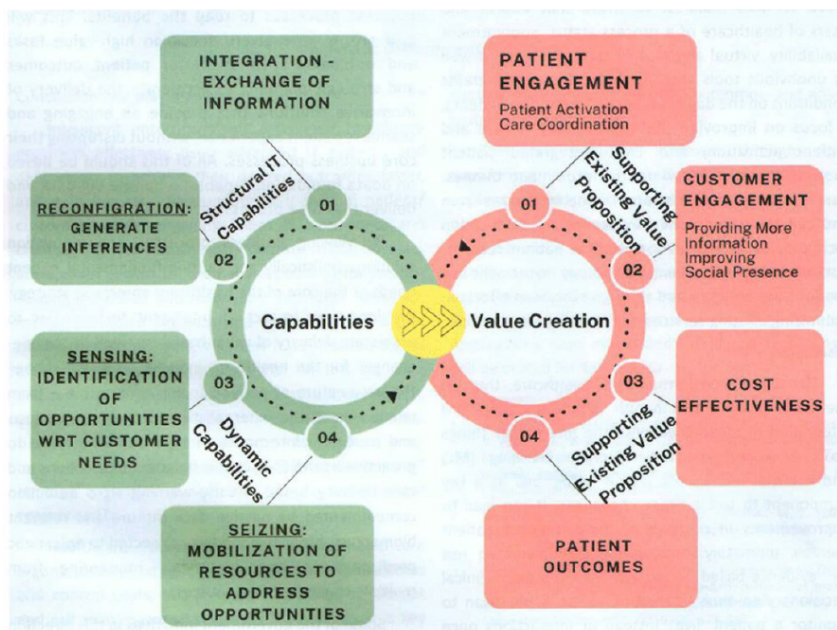


Figure 2: Proposed theoretical framework for digital transformation in healthcare

Improving Healthcare Access and Outcomes

- **Enhanced Access:** In a country like India, where healthcare infrastructure is unevenly distributed, telemedicine has made healthcare more accessible. It bridges the gap between urban specialists and rural populations, reducing the need for travel and waiting times.
- **Patient-Centric Care:** Digital tools empower patients by providing access to personal health records and enabling self-monitoring through apps and wearables. This shift from reactive to proactive care emphasizes prevention and early intervention, improving long-term outcomes.
- **Lowering Healthcare Costs:** AI and automation help streamline processes, reducing inefficiencies and lowering healthcare costs. This is crucial for a resource-constrained country like India, where healthcare affordability remains a challenge.

Challenges to Digital Transformation in Healthcare

- **Regulatory Barriers:** Healthcare is highly regulated due to the sensitive nature of patient data and the critical nature of medical procedures. Compliance with data privacy laws, such as the General Data Protection Regulation (GDPR) in Europe and India’s Data Protection Bill, is essential to ensure patient confidentiality.
- **Interoperability Issues:** Healthcare systems across the world often operate in silos, making it difficult to integrate diverse digital tools. Interoperability challenges hinder seamless data sharing between different healthcare providers and limit the effectiveness of Big Data analytics.

- **Digital Divide:** In developing countries like India, digital healthcare solutions can exacerbate the existing digital divide. Limited internet access and digital literacy in rural areas can prevent the equitable distribution of technology-driven healthcare services.
- **Technical Debt and Legacy Systems:** Many healthcare organizations are constrained by legacy IT systems that cannot easily adapt to modern technologies. Migrating to newer, more efficient platforms requires significant investment and time.



Healthcare Policy and Government Initiatives

- **National Digital Health Mission (NDHM):** Launched in 2020, the NDHM aims to create a unified digital health infrastructure across the country. It includes the development of unique health IDs for individuals, enabling better access to medical records and integrated healthcare services.
- **eSanjeevani Telemedicine Service:** During the COVID-19 pandemic, India's Ministry of Health and Family Welfare launched eSanjeevani, a telemedicine platform that provides free virtual healthcare consultations. The service has been instrumental in extending healthcare to underserved areas.
- **Ayushman Bharat Digital Mission:** This flagship program seeks to leverage digital tools to enhance healthcare delivery. It focuses on improving health infrastructure, creating a digital health ecosystem, and ensuring universal health coverage.

Way Forward: Building Intelligent Healthcare Systems

The future of healthcare lies in building intelligent healthcare enterprises that seamlessly integrate technology into every aspect of patient care. This transformation must be guided by the following principles:

- **Patient-Centric Approach:** The healthcare system of tomorrow should prioritize patient needs and deliver personalized care. Leveraging AI and Big Data will enable tailored treatment plans based on patient genetics, lifestyle, and medical history.
- **Value-Based Care:** Moving away from volume-based care, healthcare providers should focus on outcomes and efficiency. This can be achieved by investing in analytics tools that measure patient outcomes and reduce waste in healthcare processes.
- **Integration and Interoperability:** Ensuring that all digital health tools are interoperable and connected will allow for the seamless exchange of information, improving coordination among healthcare providers.

- **Bridging the Digital Divide:** To ensure equitable access to digital healthcare, the government must invest in infrastructure and digital literacy programs. Public-private partnerships can also play a role in expanding healthcare access to underserved regions.

Conclusion

The digital transformation of healthcare offers unprecedented opportunities to enhance patient care, improve access, and reduce costs. However, realizing its full potential requires addressing regulatory, technical, and socio-economic challenges. With the right policies and investments, digital healthcare can revolutionize India's healthcare system, making it more resilient, patient-centric, and efficient. By embracing these innovations, we can build a healthcare system that not only responds to current challenges but also anticipates future ones, ultimately improving the health and well-being of all citizens.

CHAPTER 3- THE ROLE OF AGRICULTURE IN PROMOTING HEALTH AND NUTRITION

Agriculture plays a critical role in ensuring food security, promoting public health, and addressing malnutrition and non-communicable diseases (NCDs). As global challenges like food scarcity and climate change intensify, it becomes essential to harness the potential of agriculture in fostering nutrition and public health outcomes. Below are key areas that highlight agriculture's contribution to health and nutrition:

Agriculture as a Source of Nutrient-Dense Foods



**Ministry of Agriculture & Farmers Welfare
Government of India**

NATIONAL FOOD SECURITY MISSION

INCREASE FOOD PRODUCTION: ENHANCE FOOD SECURITY

Important Points

- NFSM provides 'Cropping system based Training' to farmers.
- Crop/Subject matter specialists of ICAR Institute/SAUs /KVKs train trainers/farmers.
- Focus is on crop management practices and awareness about high yielding varieties/hybrids and practices.
- Central assistant of Rs.14000/ training (Rs.3500/session) is provided.
- Under NFSM, at least 30% funds allocated for women farmers.

- Agriculture provides a variety of nutrient-rich foods, essential for maintaining health and well-being. Fruits, vegetables, legumes, and whole grains, along with animal-based foods, deliver essential nutrients, vitamins, minerals, proteins, and healthy fats that support immunity, growth, and chronic disease prevention.
- Biofortified crops, which are genetically enhanced to contain higher levels of micronutrients, further address hidden hunger and improve dietary diversity. Initiatives like HarvestPlus exemplify how agriculture can tackle nutrient deficiencies globally.

Link Between Agricultural Practices and Dietary Diversity

- In countries like India, agriculture's diverse practices promote dietary diversity, which is essential for optimal nutrition.
- Mixed farming, agroforestry, and multi-cropping systems ensure a steady supply of nutrient-dense foods year-round. Pulses, cereals, fruits, and vegetables grown together provide balanced nutrition, especially in rural regions.



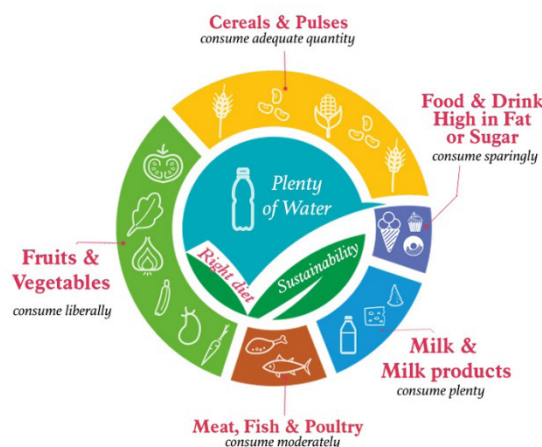
- Policies such as the **National Food Security Mission (NFSM)** and **Mission for Integrated Development of Horticulture (MIDH)** have enhanced the production of nutrient-rich crops, improving food security and dietary diversity across the nation.

Agricultural Policies and Public Health

- Agricultural policies directly impact public health by influencing food production, availability, and quality. In India, the National Food Security Act ensures access to staple foods for over 800 million people, while the POSHAN Abhiyaan focuses on improving maternal and child nutrition through agriculture.
- Policies promoting organic farming, such as Paramparagat Krishi Vikas Yojana (PKVY), contribute to producing healthier, toxin-free foods, further reducing risks of chronic diseases like cancer.

Sustainable Agriculture and Food Security

- Sustainable agriculture is essential for long-term food security. With environmental degradation and climate change threatening food production, sustainable farming practices such as Zero Budget Natural Farming (ZBNF) and climate-resilient crops like millets are crucial.



- These methods not only ensure food availability but also protect natural resources and improve nutritional outcomes.
- The resurgence of millet cultivation, recognized in the International Year of Millets 2023, demonstrates the importance of traditional, resilient crops in addressing malnutrition and climate change.

Agriculture’s Role in Combating Non-Communicable Diseases

- Agriculture is vital in reducing the global burden of NCDs like diabetes, heart disease, and cancer. By promoting the cultivation of nutrient-dense crops such as fruits, vegetables, and whole grains, agriculture can help prevent these diseases.

The 'Panchamrita' of Zero Budget Natural Farming

- Jivamrita**: Boosting microorganisms & earthworms in the soil
- Bijamrita**: Protecting young roots from fungus & soil-borne diseases
- Acchadana**: Covering plants to suppress weed growth & retain moisture
- Whapasa**: Encouraging reduced irrigation
- Intercropping**: Growing one crop alongside another to attract variety of beneficial insects

- Additionally, organic farming and biofortified crops contribute to healthier food production, mitigating risks associated with harmful agricultural inputs like chemical pesticides.

Conclusion

Agriculture’s role in promoting health and nutrition is undeniable in today’s world of complex challenges. By focusing on sustainability, nutrition-sensitive farming, and innovative agricultural policies, agriculture can be a powerful tool in combating malnutrition, ensuring food security, and improving public health. India’s commitment to integrating agriculture with public health goals offers a path toward a healthier, more resilient future for its population and the world.

CHAPTER 4- HEALTH MANAGEMENT IN RURAL INDIA: ROLE OF HEALTH TECH STARTUPS

The healthcare sector in India is evolving rapidly, contributing significantly to the economy through various segments like hospitals, medical devices, telemedicine, medical tourism, health insurance, and more. As healthcare coverage expands, there is a notable increase in investments from both public and private players.

- At the forefront of this transformation are health-tech startups, which are reshaping healthcare delivery by integrating technology into patient care. These startups leverage advanced technologies such as artificial intelligence (AI), telemedicine, data analytics, and wearables to create innovative solutions for healthcare challenges, making healthcare more efficient and accessible.

The Need for Innovation in Indian Healthcare

- Despite increased public healthcare expenditure—rising to 2.1% of GDP in FY23 from 1.6% in FY21—India still falls behind the global average in terms of healthcare funding and doctor availability per 1,000 citizens.

- The healthcare sector faces challenges of infrastructure gaps, particularly in rural and tier-3/tier-4 cities, and ensuring affordability for the masses.
- The pressing need for innovation is apparent in creating an interconnected, cost-effective, and efficient healthcare system to improve accessibility and quality care across the nation.
- Government initiatives, like Ayushman Bharat launched in 2018, have been instrumental in improving healthcare access.
- However, large sections of rural India continue to struggle with access to basic medicines and treatment. Health-tech startups have emerged as key players in addressing these shortcomings, particularly in making healthcare services more accessible and efficient.

Advantages of Health-Tech Startups

- Health-tech startups are transforming healthcare operations, using AI and machine learning for diagnostics, predictive analysis, and even personalized medicine.

The ABDM Ecosystem



- By streamlining administrative tasks, improving resource allocation, and enhancing diagnostic accuracy, they have reduced the workload on doctors and hospitals, allowing for more patient-centric care.
- According to the Department for Promotion of Industry and Internal Trade (DPIIT), over 10,000 healthcare startups were registered in 2023, 47% of which came from tier-2 and tier-3 cities.
- The surge in health-tech startups, particularly those focusing on telemedicine, has grown exponentially, driven in large part by the COVID-19 pandemic.
- These startups have made healthcare services accessible to rural populations by bridging the gap between urban and rural healthcare infrastructure.

Telemedicine and its Impact

Telemedicine has been a key driver in the rise of health-tech startups. Remote consultations, enabled by telehealth platforms, have become popular during and after the pandemic, allowing patients in rural areas to access expert advice without the need for physical travel.

- The Indian telemedicine market is projected to grow at a compound annual growth rate (CAGR) of 31% between 2020 and 2025, while the e-pharmacy market is expected to grow at a CAGR of 44%, reaching \$4.5 billion by 2025.
- By eliminating geographical barriers, telemedicine offers rural and urban patients equal access to healthcare services, thus reducing disparities and improving overall health outcomes.
- The integration of teleconsultation, telepathology, and teleradiology has been transformative in the Indian healthcare landscape.

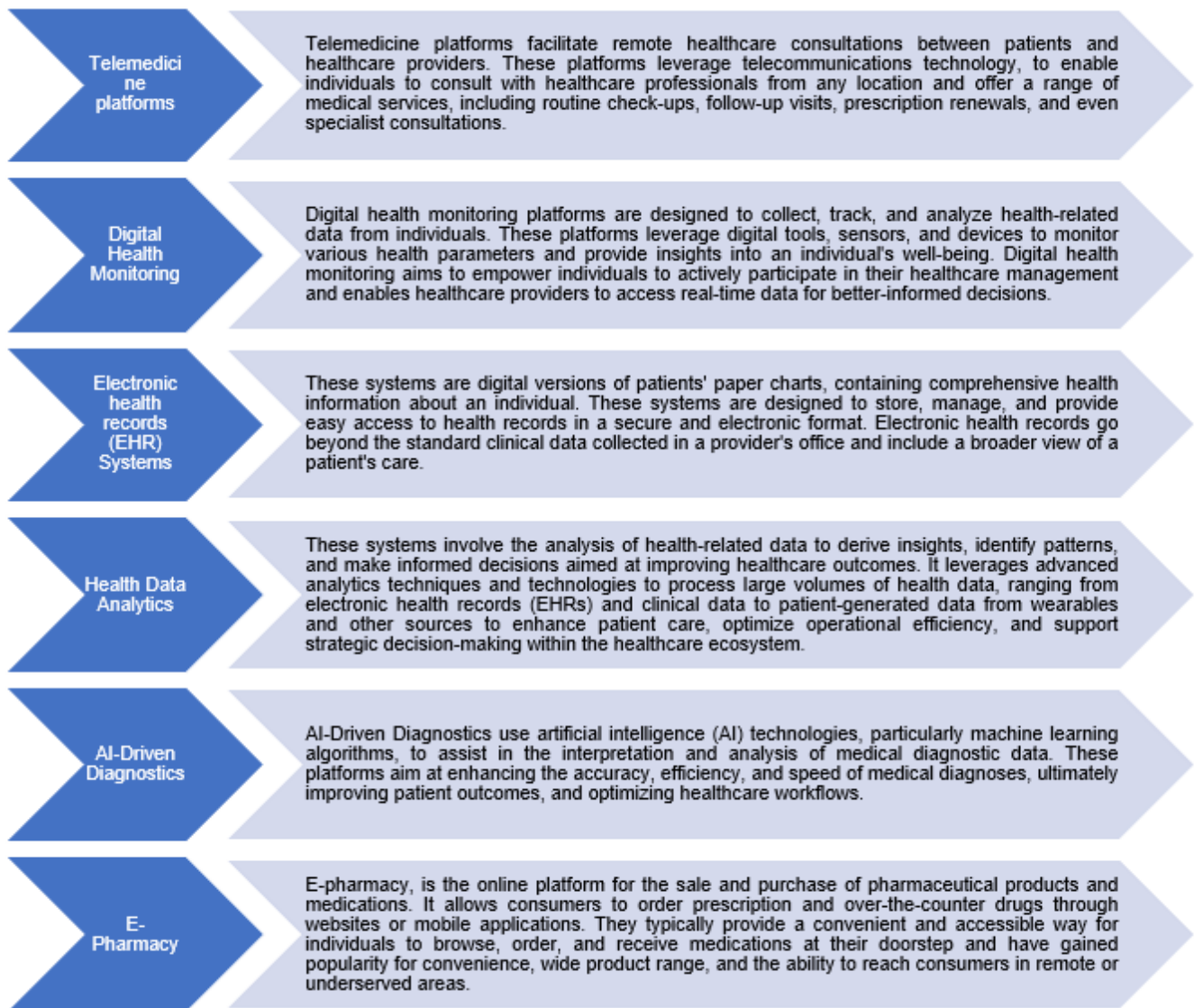
Government Initiatives: National Digital Health Mission (NDHM)

The Indian government has launched several initiatives to promote health-tech and digitization in healthcare. The **National Digital Health Mission (NDHM)** aims to digitize healthcare by creating registries for healthcare facilities, providers, laboratories, and pharmacies.

- This initiative is expected to improve clinical decision-making and provide patients with easy access to their health records.

Other government-led efforts include:

- **Health ID:** A unique health identifier for each citizen.
- **Digi Doctor:** A comprehensive database of doctors and their qualifications.
- **Health Facility Register (HFR):** A centralized database of healthcare facilities for public and private use.
- **Personal Health Records (PHR):** A digital repository of an individual’s health history.
- **Electronic Medical Records (EMR):** A system for storing patient health records digitally.



Conclusion

Health-tech startups are playing a crucial role in transforming India’s healthcare sector, addressing challenges related to accessibility, affordability, and quality. The growing adoption of telemedicine, AI-driven diagnostics, and digital health records is helping to bridge the gap between rural and urban healthcare. Supported by government initiatives like the National Digital Health Mission, the health-tech industry is poised for significant growth, projected to reach a market size of US\$ 50 billion by 2033. As the synergy between technology and healthcare strengthens, India’s healthcare system is set to undergo a transformative change, improving health outcomes nationwide and contributing to better overall quality of life.

UPSC Mains Practice Questions.*(Around 250 words)*

- Q1. India faces a dual burden of malnutrition, where both undernutrition and overnutrition coexist." Discuss the major factors contributing to this paradox and suggest policy measures to address both ends of the spectrum.
- Q2. Critically analyze the effectiveness of India's Integrated Child Development Services (ICDS) scheme in addressing malnutrition among children. How can the scheme be reformed to improve its outcomes?
- Q3. Analyze the role of the National Digital Health Mission (NDHM) in transforming healthcare access and delivery in India. How can it contribute to addressing the healthcare needs of marginalized populations?

