Disclosures

None

Objectives

1. Describe the impact of AI-driven digital transformation.

2. Analyze the key challenges and strategic considerations for successful AI integration within healthcare organizations.

3. Formulate a digital transformation roadmap incorporating AI technologies to drive operational excellence and improve patient outcomes in healthcare settings.

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Mainframe and PCs
1960s–1980s

Client server and internet
1990s–2000s

Cloud, mobile and big data
2000s–2010s

Intelligent technologies
2010s–2020s

Enabling technologies

- Transistors & silicon revolution
- Large scale mainframe computing adoption
- Emergence of PC's
- Plant floor automation

- Widespread PC adoption
- Broadband internet
- ERP and business process technologies

- Mobile & smartphone ubiquity
- Cloud computing
- Social networks
- Big data

- Machine learning (ML) and artificial intelligence (AI)
- Internet of things (IoT) and distributed computing
- Blockchain

Customer value creation

Industrial automation

Business process automation

Digital transformation

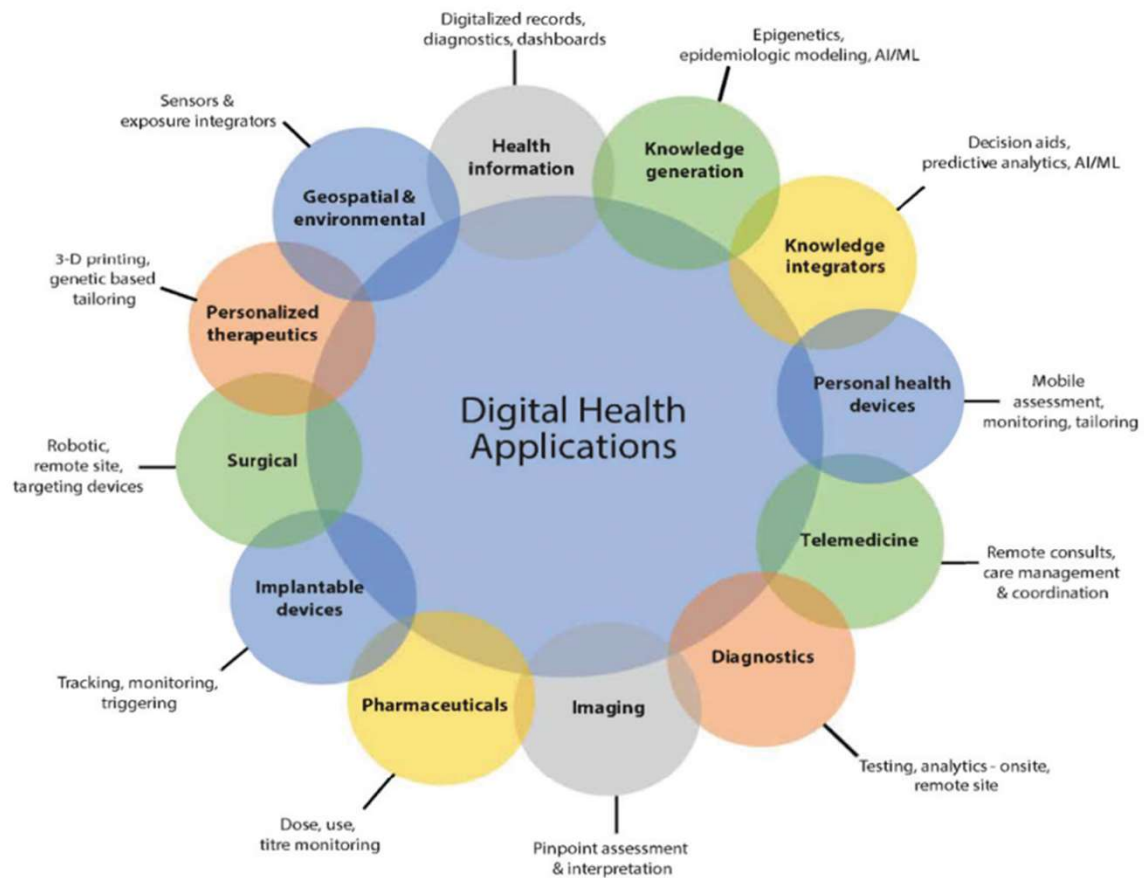**Intelligent enterprise**

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FIGURE 1 | Evolving Applications of Digital Technology in Health and Health Care
SOURCE: National Academy of Medicine. 2019. *Digital Health Action Collaborative, NAM Leadership Consortium: Collaboration for a Value & Science-Driven Health System.*
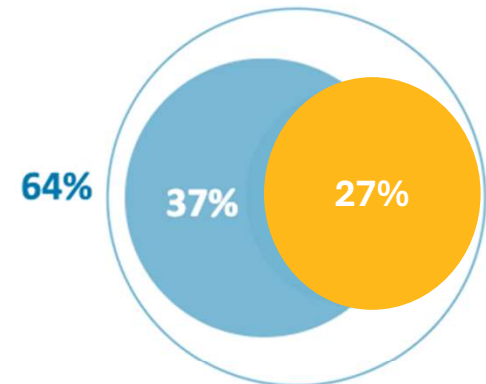
Level Setting

It is genuinely challenging to set a comprehensive GenAI strategy today.

" How much do you agree with the following statements about generative AI at your organization "

- ● Agree
- ● Strongly agree
- ○ Agree/Strongly agree

It's difficult to set a long-term strategy with rapid pace generative AI is evolving

64% 37% 27%

My organization has focused more on short-term experimentation in generative AI, rather than forming a long-term strategic vision.

59% 33% 25%

Base: 150 US health payer and delivery decision-makers at the director level or higher who are responsible for generative AI strategies at their organization
Note: Showing top two responses; total percentages may not equal separate values due to rounding.
Source: A commissioned study conducted by Forrester Consulting on behalf of EXL, March 2024

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Level Setting

Data drives GenAI's power but can also complicate adoption.

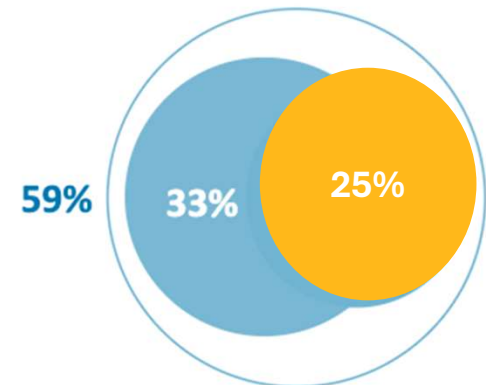" How much do you agree with the following statements about generative AI at your organization "

● Agree   ● Strongly agree

○ Agree/Strongly agree

My organization has lots of data, but it's not yet prepared to leverage it effectively for generative AI.

81%   42%   39%
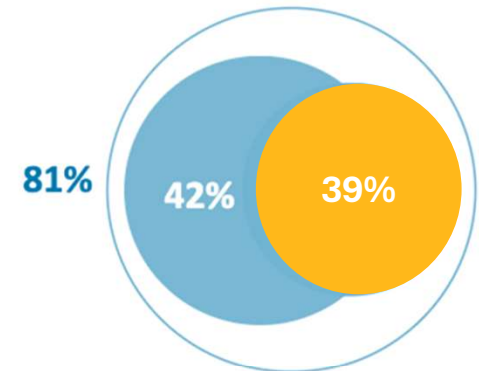
The volume and types of data my organization works with is constantly expanding
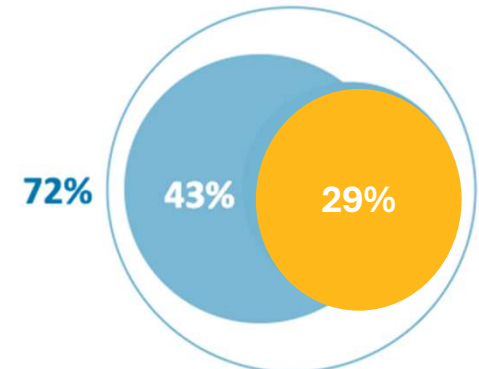
72%   43%   29%

Base: 150 US health payer and delivery decision-makers at the director level or higher who are responsible for generative AI strategies at their organization
Note: Showing top two responses
Source: A commissioned study conducted by Forrester Consulting on behalf of EXL, March 2024

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Level Setting

It's time to move from experimentation to implementation.

" What kind of impact will/has generative AI have/had on your organization's ability to meet its key business goals? "

- Transformative positive impact
- Significant positive impact
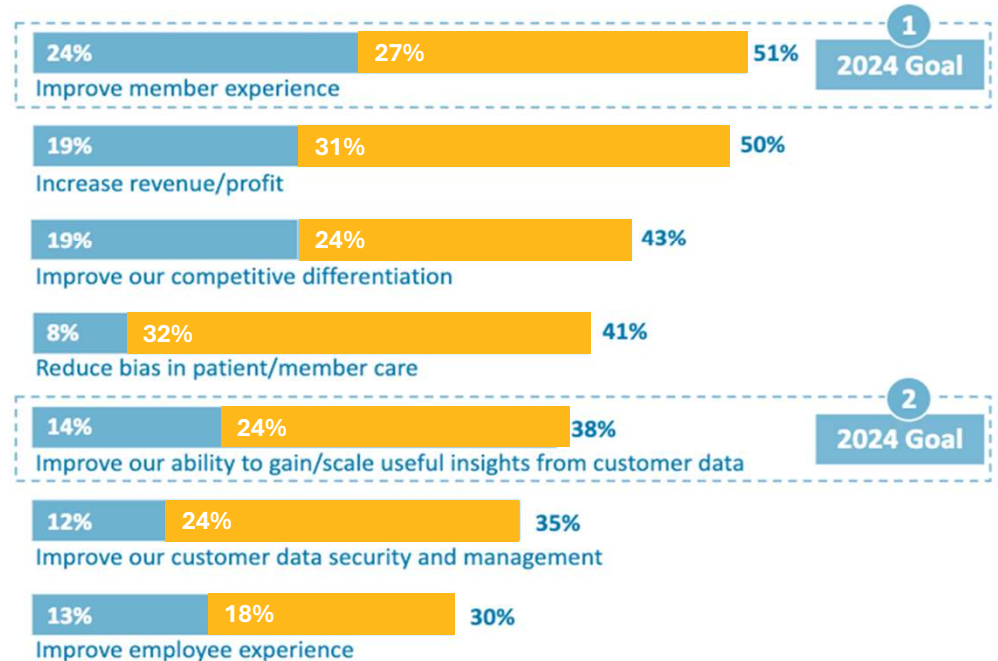
Improve member experience	24%	27%	51% — **1 2024 Goal**
Increase revenue/profit	19%	31%	50%
Improve our competitive differentiation	19%	24%	43%
Reduce bias in patient/member care	8%	32%	41%
Improve our ability to gain/scale useful insights from customer data	14%	24%	38% — **2 2024 Goal**
Improve our customer data security and management	12%	24%	35%
Improve employee experience	13%	18%	30%

Base: 150 US health payer and delivery decision-makers at the director level or higher who are responsible for generative AI strategies at their organization
Note: Showing seven responses; total percentages may not equal separate values due to rounding.
**Source:** A commissioned study conducted by Forrester Consulting on behalf of EXL, March 2024

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Is Digital Health Needed to Solve the Problem?

01 Cost

02 Bias

03 Maintenance

04 Effort

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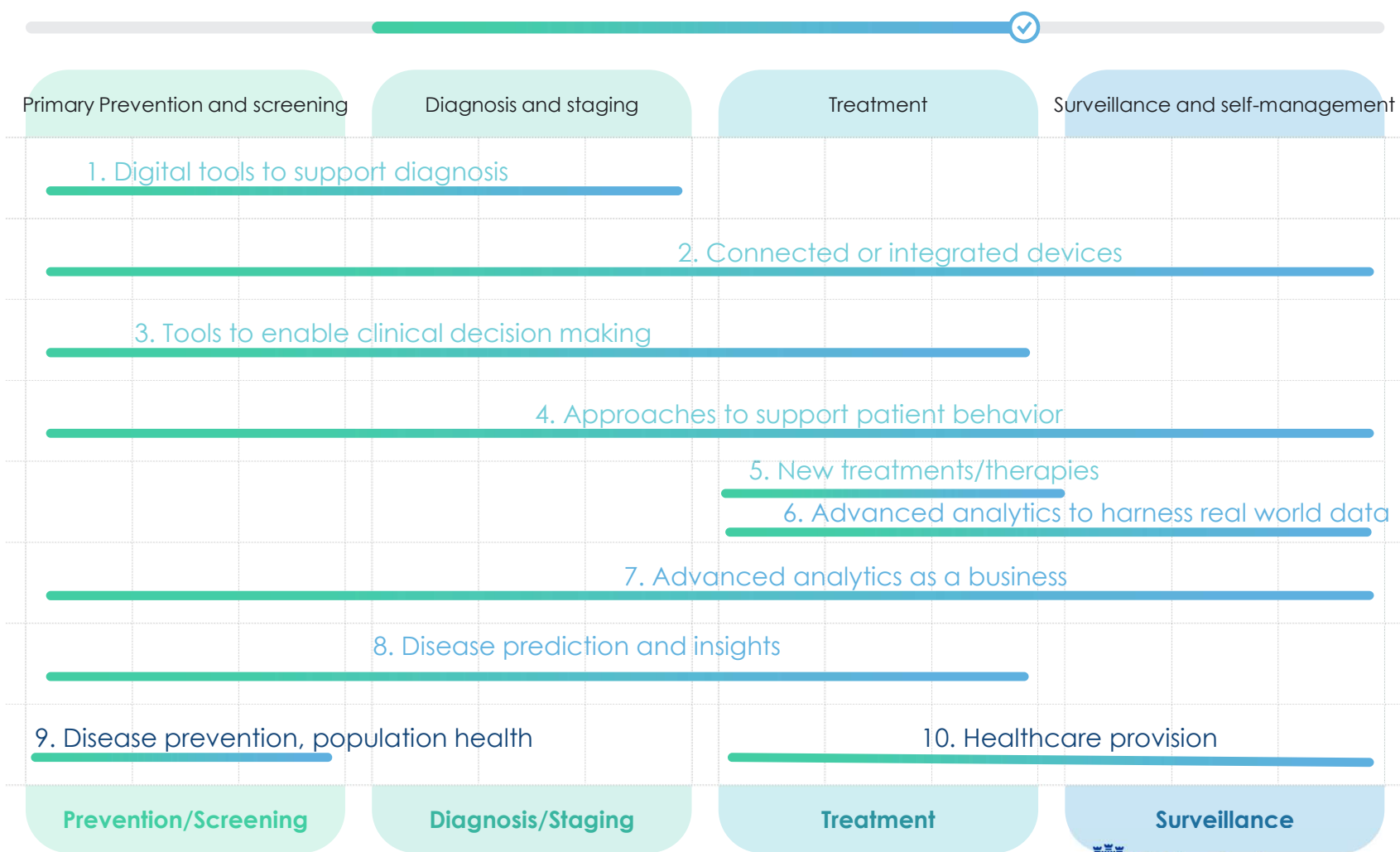
1-5 Products and Tools

6-8 Data

9-10 Services

Primary Prevention and screening | Diagnosis and staging | Treatment | Surveillance and self-management

1. Digital tools to support diagnosis

2. Connected or integrated devices

3. Tools to enable clinical decision making

4. Approaches to support patient behavior

5. New treatments/therapies

6. Advanced analytics to harness real world data

7. Advanced analytics as a business

8. Disease prediction and insights

9. Disease prevention, population health

10. Healthcare provision

Prevention/Screening | **Diagnosis/Staging** | **Treatment** | **Surveillance**

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Statistics

Global healthcare spending is projected to reach $10 trillion by 2024.

AI has the potential to reduce this spending by up to $360 billion.

By 2030, there will be a global shortage of over 10 million healthcare workers.

AI can help bridge this gap by automating tasks and supporting healthcare professionals.

Chronic diseases are on the rise, accounting for 75% of global healthcare costs.

AI-powered tools can improve chronic disease management and prevention.

McKinsey Deloitte Journal of Computer Information Systems McKinsey
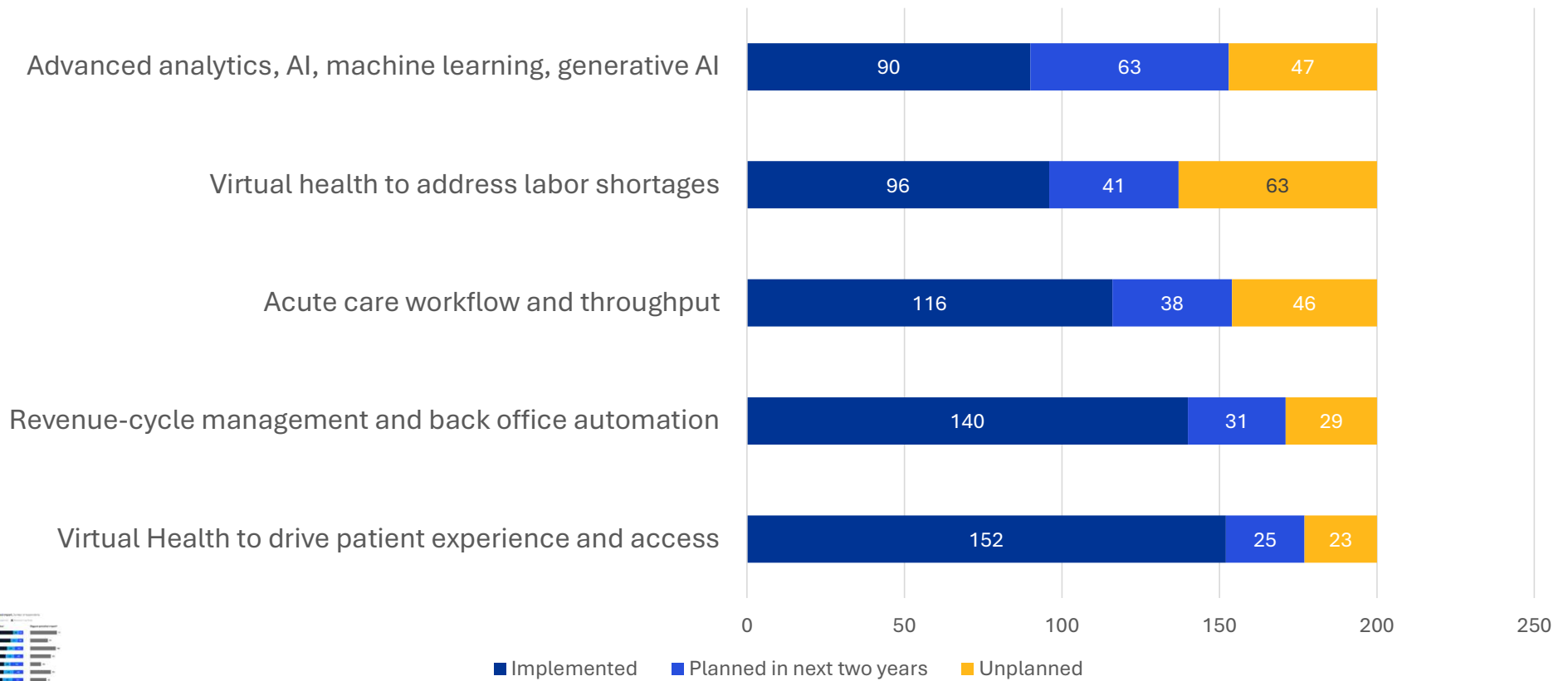
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Digital Investment Priority Areas and Perceived Impact

	Implemented	Planned in next two years	Unplanned
Advanced analytics, AI, machine learning, generative AI	90	63	47
Virtual health to address labor shortages	96	41	63
Acute care workflow and throughput	116	38	46
Revenue-cycle management and back office automation	140	31	29
Virtual Health to drive patient experience and access	152	25	23

■ Implemented ■ Planned in next two years ■ Unplanned

McKinsey

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Why should you invest?

- **Improved patient outcomes:** AI can lead to earlier and more accurate diagnoses, personalized treatments, and better disease management.

- **Increased efficiency and reduced costs:** AI can automate administrative tasks, optimize resource allocation, and improve operational workflows.

- **Enhanced patient experience:** AI-powered tools can provide 24/7 access to care, personalized support, and improved communication with healthcare providers.

What the data shows?

Growth in Spending

- **Employers**
- **Health Systems**
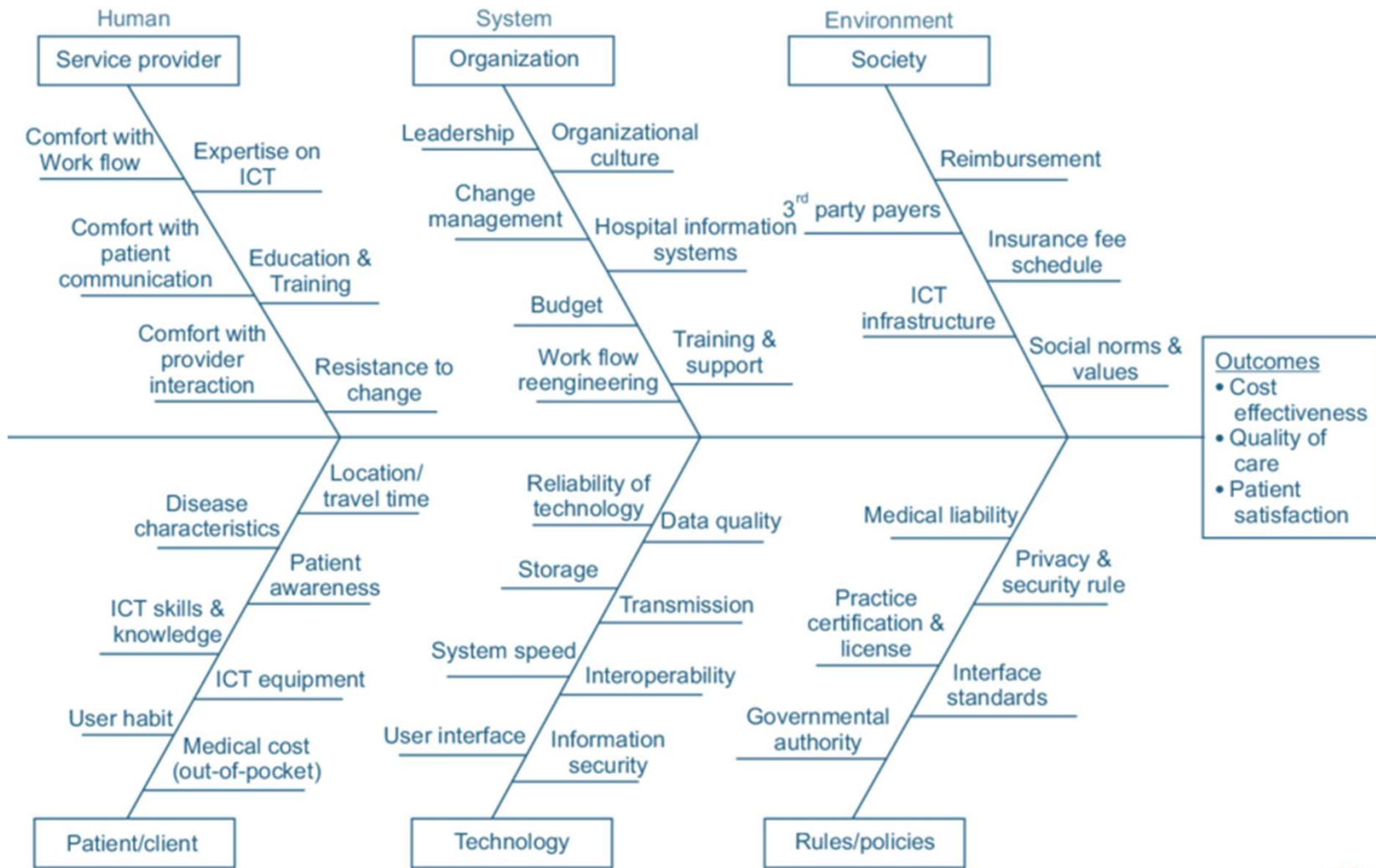- **Health Plans**

Key Factors Driving Investment

- **Consumer Demand**
- **Improved Health Outcomes**
- **Cost Savings**

2024 State of Digital Health Purchasing
A Survey of Health Plans, Employers, and Health Systems

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Barriers of Digital Health
- Upfront cost
- Patient privacy
- Efficacy and safety
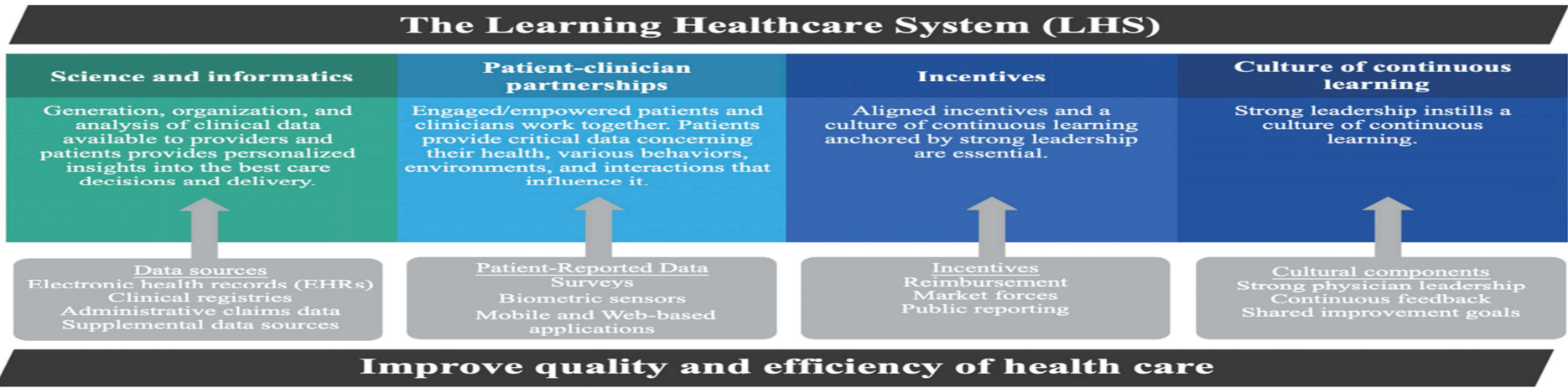- Familiarity/adaptability
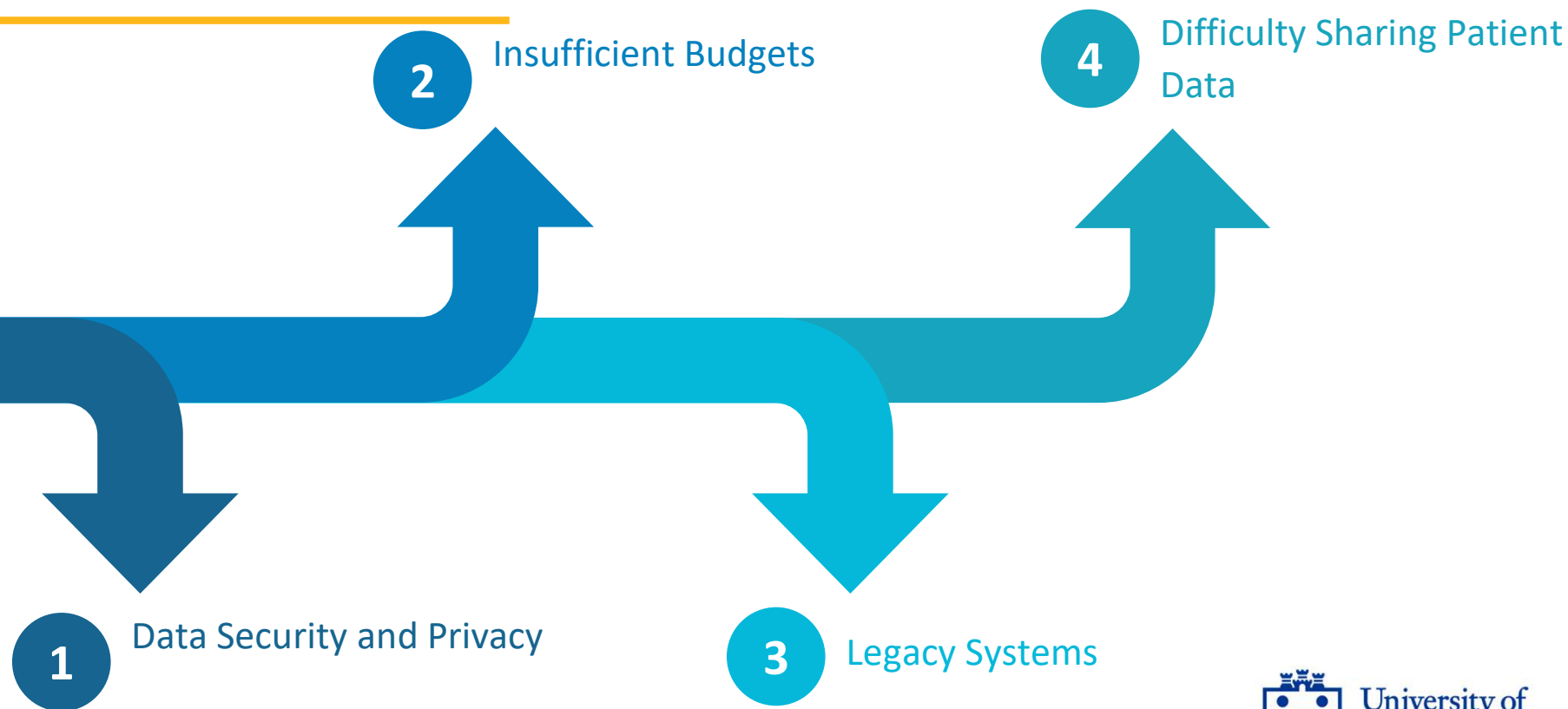- Accessibility for certain groups

Benefits of Digital Health
- Increased access
- Long-term cost reduction
- Personalized/tailored medicine
- Improved clinical cardiovascular treatment

Mobile health (mHealth)
Electrocardiography
Accelerometers
Remote patient monitoring
Photoplethysmography

The Learning Healthcare System (LHS)

Science and informatics	Patient-clinician partnerships	Incentives	Culture of continuous learning
Generation, organization, and analysis of clinical data available to providers and patients provides personalized insights into the best care decisions and delivery.	Engaged/empowered patients and clinicians work together. Patients provide critical data concerning their health, various behaviors, environments, and interactions that influence it.	Aligned incentives and a culture of continuous learning anchored by strong leadership are essential.	Strong leadership instills a culture of continuous learning.
Data sources: Electronic health records (EHRs), Clinical registries, Administrative claims data, Supplemental data sources	Patient-Reported Data: Surveys, Biometric sensors, Mobile and Web-based applications	Incentives: Reimbursement, Market forces, Public reporting	Cultural components: Strong physician leadership, Continuous feedback, Shared improvement goals

Improve quality and efficiency of health care

Factors Affecting Healthcare Facilities' Ability to Adopt Digital Technologies

2 Insufficient Budgets

4 Difficulty Sharing Patient Data

1 Data Security and Privacy

3 Legacy Systems

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Policy and Practice Recommendations

1
Use what works
Smartphones

2
What is effective?
Behavior, medication
Compliance, assessment

3
EBM needed
Further review

4
Start in one place
Psychiatric care

5
Practice adoption
Collaborate

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Three areas of focus

Patients

Workforce

Technology

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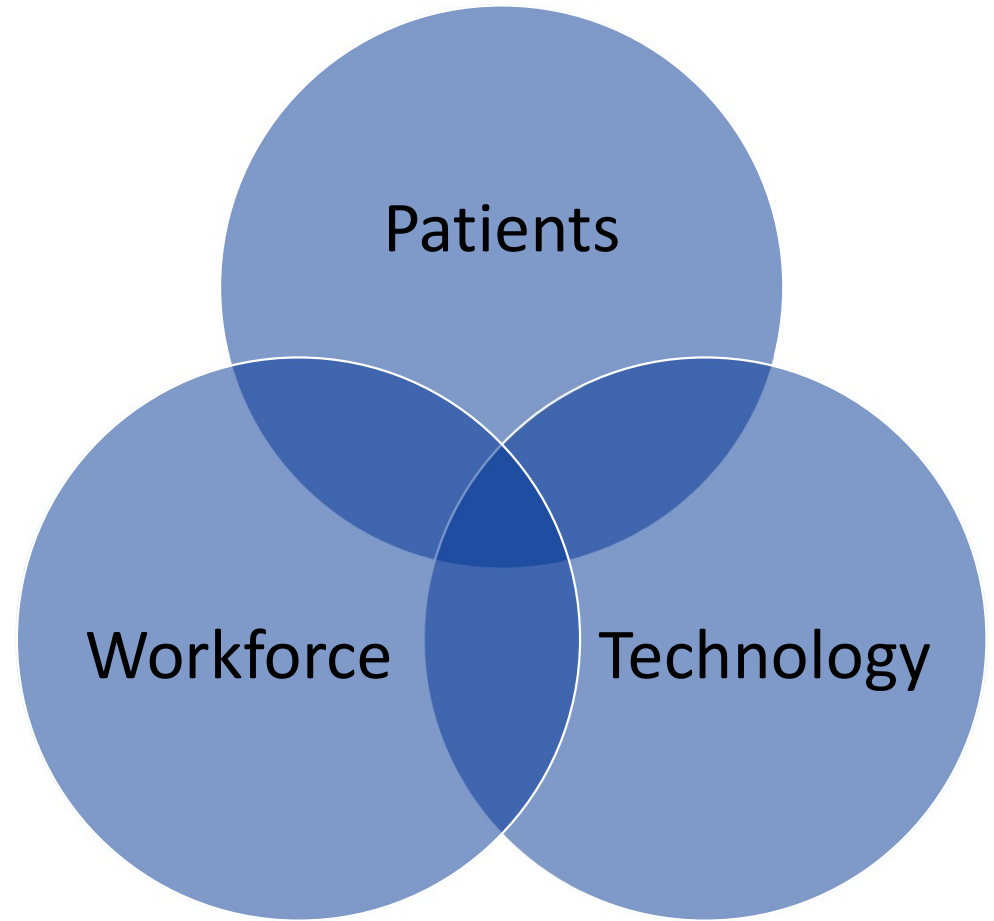
Patient-Centric AI

- **AI-powered symptom checkers and virtual assistants**

- **Remote patient monitoring (RPM) using wearable devices**

- **Personalized treatment plans**

Better & More Personalized Services

Better Communication with Clinicians

Enhanced Patient Engagement

Easy Access to Personal Health Data

Track Health Metrics in Real Time

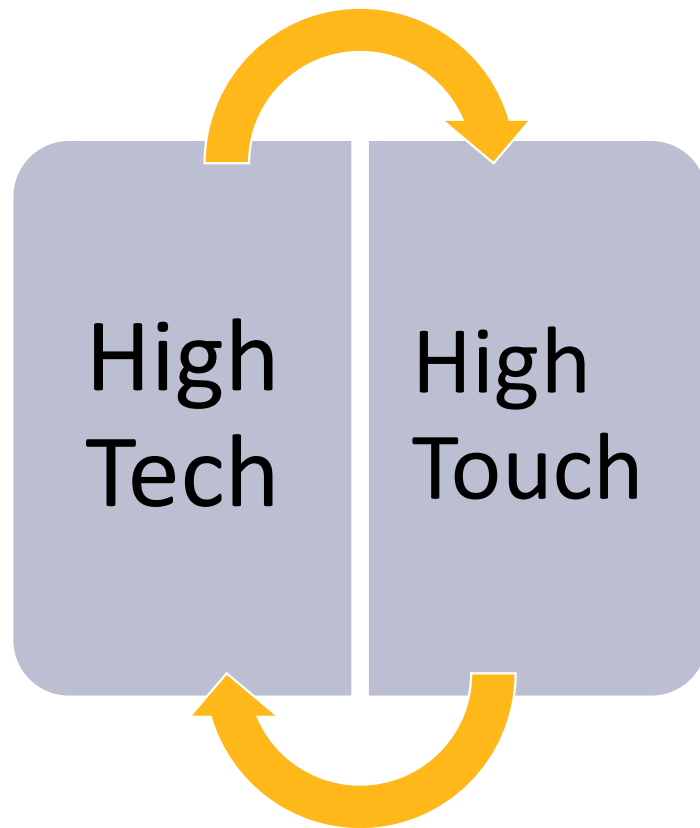Convenient Appointment Scheduling

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Strategic Investment in AI

- **Develop a comprehensive AI strategy**
- **Invest in robust data infrastructure**
- **Foster collaboration and partnerships**

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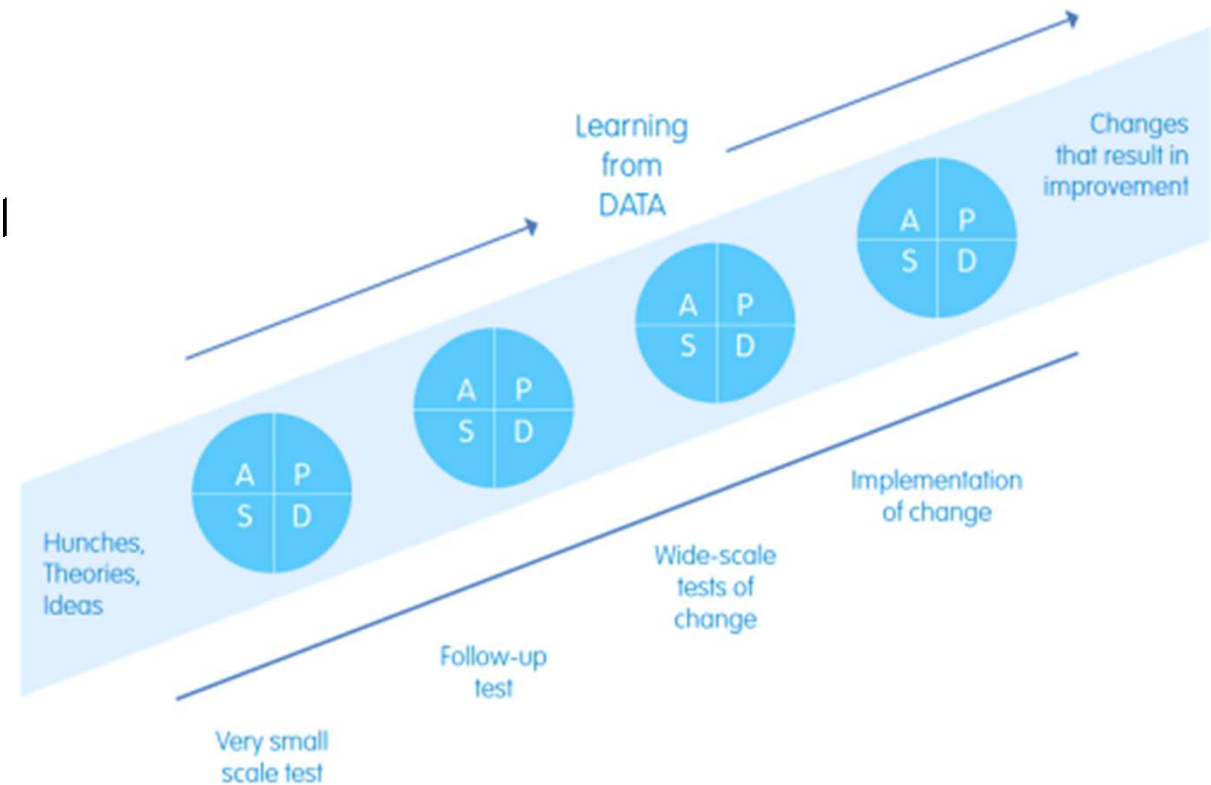
Workforce Training and Development

High Tech ⇄ High Touch

- Upskilling and reskilling programs
- Create new roles
- Promote a culture of innovation

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Scale pilots across all departments

Establish a fully digital, AI-optimized ecosystem

Adapt to emerging healthcare trends

Integrate AI into clinical decision-making processes

Establish an infrastructure that supports the integration of technologies

Continue refining AI systems for patient-centric outcomes

Foster a culture of innovation and digital health literacy among clinical staff

Begin data-driven predictive analytics for operational optimization

Pilot key AI-driven initiatives in areas

NOW (Foundation Building)   **NEXT (Scaling)**   **LATER (Sustainability)**

01 **Define Problem & Plan**
- Engage stakeholders to define the problem & perform root-cause analysis
- Identify solution & plan future state
- Gather business requirements
- Assess feasibility, potential for impact, & prioritization
- Make procure/build/partner decision

02 **Design the AI System**
- Select/understand model task & architecture
- Capture design & technical requirements or determine best solution to meet business requirements
- Design solution application & system workflow according to human-centered design principles
- Design deployment strategy with end users
- Design risk management, monitoring & reporting plan

03 **Engineer the AI Solution**
- Access data
- Prepare data
- Develop data management plan
- Train & tune model

04 **Assess**
- Conduct installation qualification (when applicable)
- Validate local system performance (when applicable)
- Execute prospective, silent evaluation
- Establish risk management plan
- Train end users
- Test usefulness
- Ensure compliance with applicable healthcare regulations & standards

05 **Pilot**
- Assess real-world impact
- Execute and update risk management plan
- Educate & train users on AI application reporting
- Assess usefulness and adoption

06 **Deploy & Monitor**
- Deploy at a larger scale on a general population
- Audit AI system to inform whether to maintain, refine or sunset
- Conduct ongoing risk management

Governance
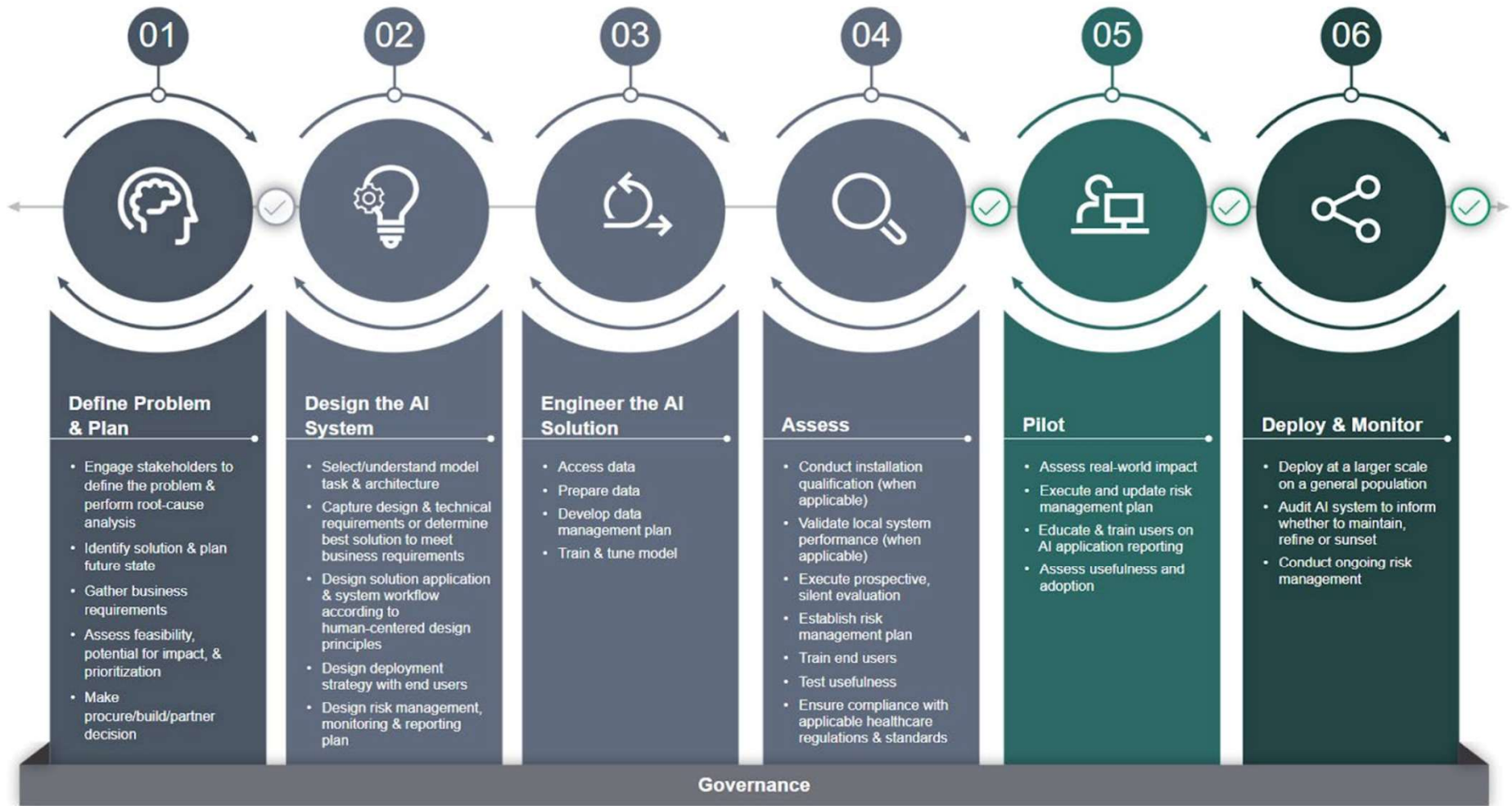
Checkpoint: iteration may occur between stages 2-4, particularly when using Agile development methodology.

Assurance checkpoint: requires evaluation of stages leading up to current.

Claude Computer Use Demo

⚠ Security Alert: Never provide access to sensitive accounts or data, as malicious web content can hijack Claude's behavior

Chat   HTTP Exchange Logs

🔴 you can see a construction site by taking screenshots, please monitor the site and look for issues with safety, things that could be improved, and opportunities for coaching. just keep going for at least 10 screenshots and then summarize

0:00 / 0:17

File Edit View Insert Format Styles Sheet Data Tools Window Help

A34   - Priority 1: Immediate action required (Same day)

	C	D	E	F	G	
1	Finding	Action Required	Target Date	Status	Responsible Party	Notes
2						
3	Exposed rebar ends without caps	Install OSHA-compliant rebar caps on all exposed ends	Immediate	Open	Site Safety Superviso▶	Critical safety issue, mus
4	Trip hazards from scattered materials	Clear all walking paths and organize materials	Immediate	Open	Site Foreman	Focus on main access pa
5	Unmarked excavation edges	Install high-visibility barriers and warning signs	Immediate	Open	Site Safety Superviso▶	Use both physical barrie
6	Vehicle-pedestrian interaction zones uncle▶	Mark clear vehicle paths and worker zones	Immediate	Open	Site Safety Superviso▶	Include staging areas fo
7						
8	Open trenches without protection	Install trench protection systems per OSHA requiremen▶	24 Hours	Open	Site Engineer	Verify soil classification
9	No visible concrete testing station	Set up dedicated testing area with proper equipment	24 Hours	Open	QC Manager	Include slump test area
10	Missing elevation control points	Install survey points and elevation markers	24 Hours	Open	Site Engineer	Critical for proper slab e
11	Inadequate PPE visibility	Implement full PPE requirements including high-viz ves▶	24 Hours	Open	Safety Manager	Document compliance cl
12						
13	Inefficient material staging	Create dedicated material staging areas	48 Hours	Open	Site Superintendent	Label areas by material
14	Poor tool organization	Set up mobile tool cribs near work areas	48 Hours	Open	Tool Room Manager	Include check-out syster
15	No visible inspection points	Install inspection station with documentation	48 Hours	Open	QC Manager	Include weather-protect
16	Unclear pour sequence	Mark and document pour sequence on forms	48 Hours	Open	Concrete Foreman	Use color coding system
17						
18	No designated break areas	Set up proper rest/water stations	72 Hours	Open	Site Superintendent	Include shade structures
19	Limited visual management	Install daily task boards and progress markers	72 Hours	Open	Project Engineer	Include weather protecti
20	No clear QA checkpoints	Establish QA stations with verification points	72 Hours	Open	QA Manager	Document all inspection
21	Limited knowledge transfer opportunities	Create designated training zones	72 Hours	Open	Training Coordinator	Include visual aids
22						
23	Dust control measures inadequate	Implement comprehensive dust control plan	1 Week	Open	Environmental Manag▶	Include water truck sche
24	Poor material flow patterns	Optimize material and equipment flow paths	1 Week	Open	Logistics Manager	Map out complete flow
25	Insufficient progress tracking	Install progress tracking system	1 Week	Open	Project Engineer	Include photo document
26	No visible best practice sharing	Create best practice documentation system	1 Week	Open	Quality Manager	Include worker input
27						
28	Informal work processes	Develop standard work procedures	2 Weeks	Open	Operations Manager	Document tribal knowled
29	Limited visual planning tools	Install visual management system	2 Weeks	Open	Project Manager	Include 3-week lookahea
30	Suboptimal crew movements	Optimize crew deployment patterns	2 Weeks	Open	General Superintend▶	Map movement patterns
31	Limited weather protection planning	Develop weather contingency plans	2 Weeks	Open	Project Engineer	Include material protecti
32						
33						
34						
35						

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DejaVu Sans   10 pt

D34

	A	B	C	D	E	F	G
1	Issue ID	Priority	Category	Finding	Status	Assigned To	Due Date
2							
3	SAF-001		1 IMMEDIATE SAFETY	Exposed rebar ends without caps	OPEN	John Smith	11/4/24
4							
5	SAF-002		1 IMMEDIATE SAFETY	Trip hazards from scattered materials	OPEN	Carlos Rodriguez	11/4/24
6							
7	SAF-003		1 IMMEDIATE SAFETY	Unmarked excavation edges	OPEN	David Wilson	11/4/24
8							
9	SAF-004		1 IMMEDIATE SAFETY	Vehicle-pedestrian interaction zones unclear	OPEN	Tom Brown	11/4/24
10							
11	QC-001		2 QUALITY CONTROL	Missing elevation control points	OPEN	Sarah Chen	11/5/24
12							
13	QC-002		2 QUALITY CONTROL	No visible concrete testing station	OPEN	Mark Davis	11/5/24
14							
15	PROC-001		3 WORKFLOW	Inefficient material staging	OPEN	Lisa Anderson	11/6/24
16							
17	PROC-002		3 WORKFLOW	Poor tool organization	OPEN	James Wilson	11/6/24
18							
19	Notes:						
20	- Daily updates required for all Priority 1 items						
21	- Photo documentation required before and after completion						
22	- Verification signature required for closeout						
23	- Root cause analysis required for all items						
24	- Preventive actions must be documented and implemented						
25							
26	Status Codes:						
27	OPEN: Issue identified	not started					
28	IN PROGRESS: Work has begun						
29	PENDING VERIFICATION: Work completed	awaiting inspection					
30	CLOSED: Issue resolved and verified						
31	ON HOLD: Work temporarily stopped						
32							
33	Tracking Requirements:						
34	1. Daily morning review of all open items						
35	2. Photo documentation of progress						
36	3. End-of-day status updates						
37	4. Weekly trend analysis						
38	5. Monthly preventive action review						

- Write clear goals

- Identify your champion

- Be flexible and adaptable

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Dr. Dipu Patel Portfolio

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