



IoT Disruption in Healthcare

Helmi Halim

Sr. Director, Corporate Market Strategy, MIMOS Bhd

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Agenda!

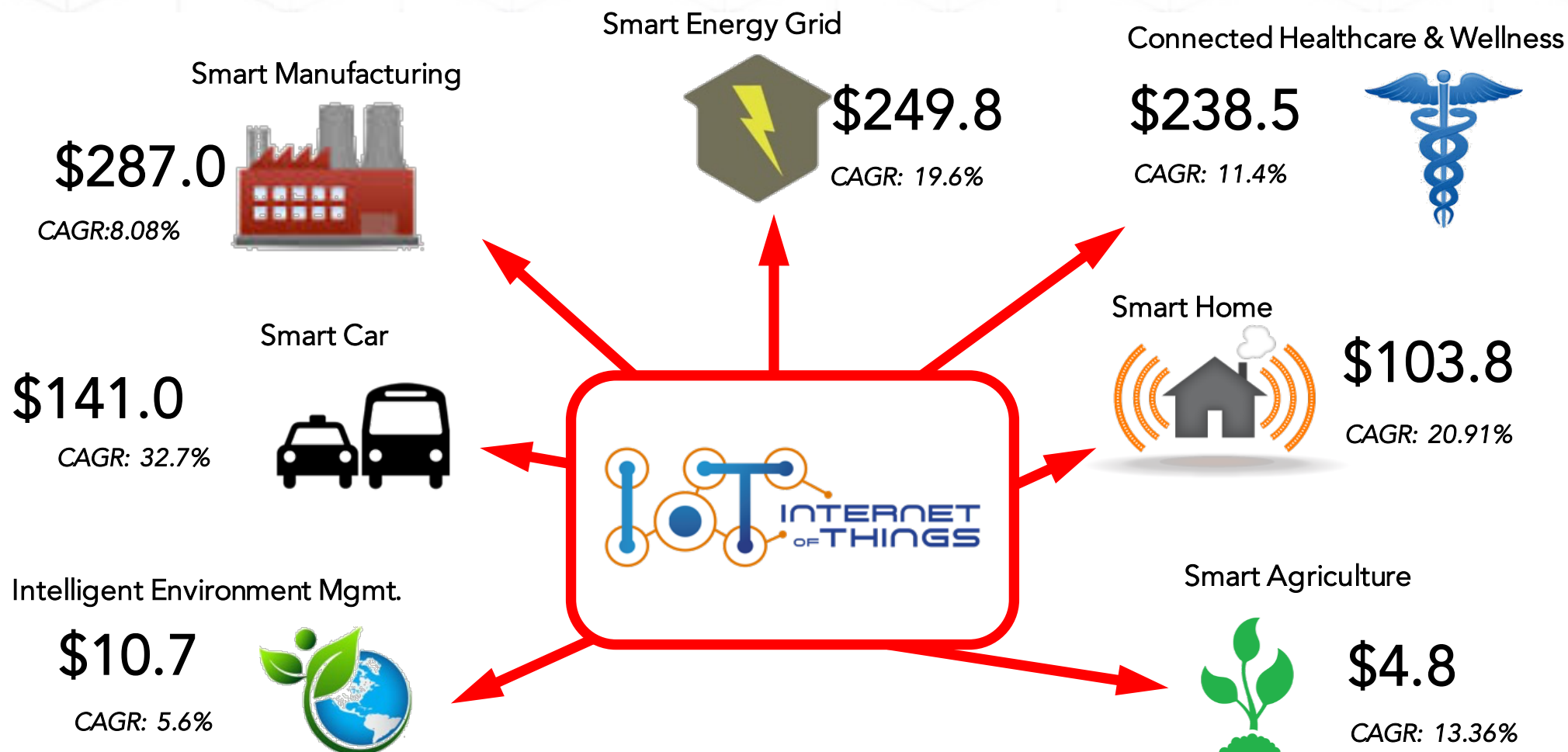
- 1 . IoT Introduction
- 2 . Key MegaTrends of Healthcare
- 3 . Healthcare Ecosystem
- 4 . Future Scenarios & Application of IoT
- 5 . MIMOS Key Research & Development

Smart Connected Devices via the Internet, seamlessly transmitting data to create new info and knowledge





2020 Global IoT Economy by Market Vertical (US\$B)



Source: Frost & Sullivan; European Commission; PR Newswire; Market Research Report; The Institution of Engineering and Technology; The Consumer Electronics Association (CEA); Market Watch; RnRMarketResearch;

Characteristics



Demographic shift

- Aging society
- Urbanization migration
- Rise of Women power



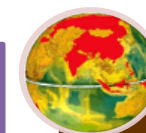
Individual empowerment

- Growth of global middle class
- Higher education level
- Better healthcare



Food, energy & water nexus

- Scarcity of natural resources
- Competitive demand of natural resources



Diffusion of power

- Well connected and networked society

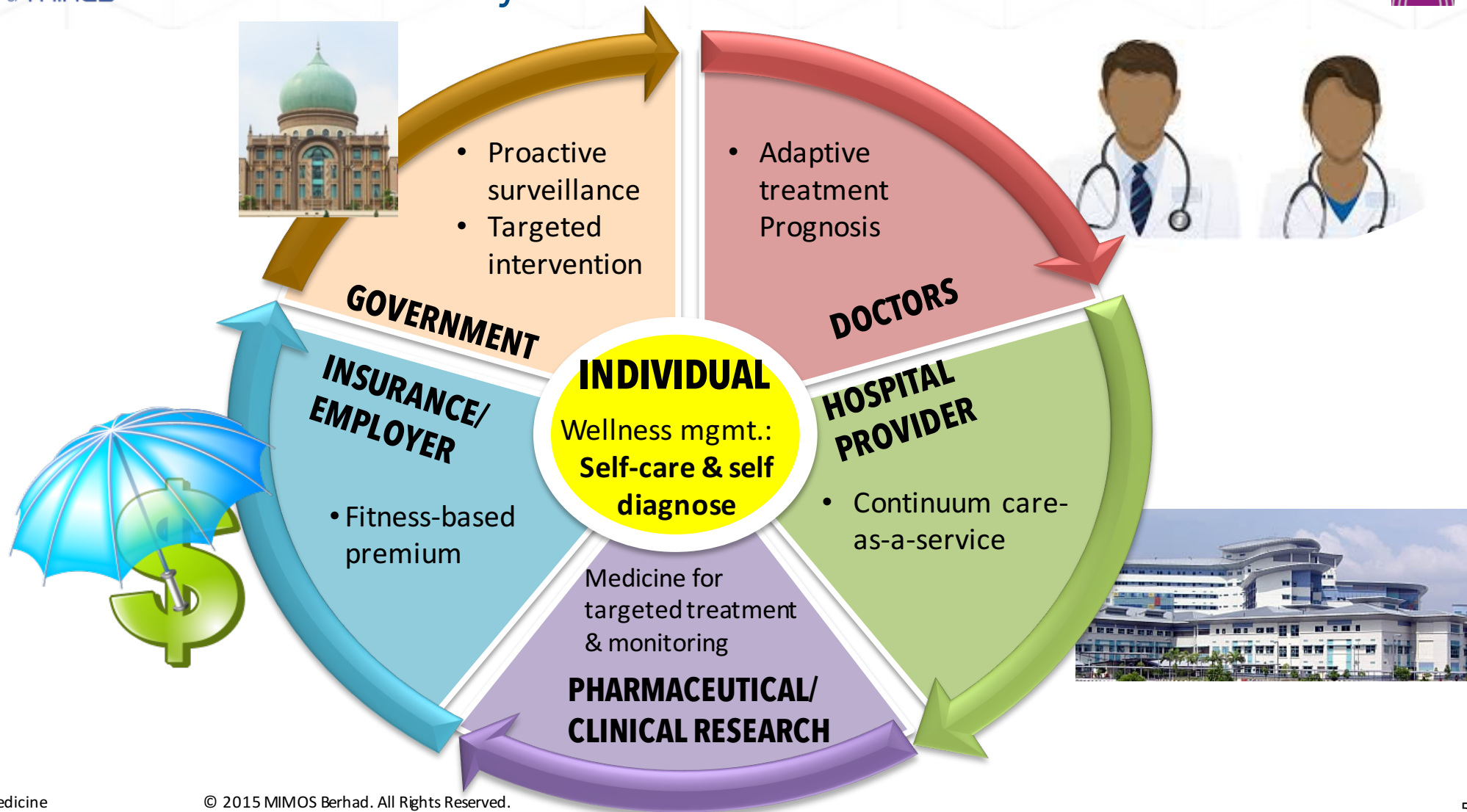
Implications

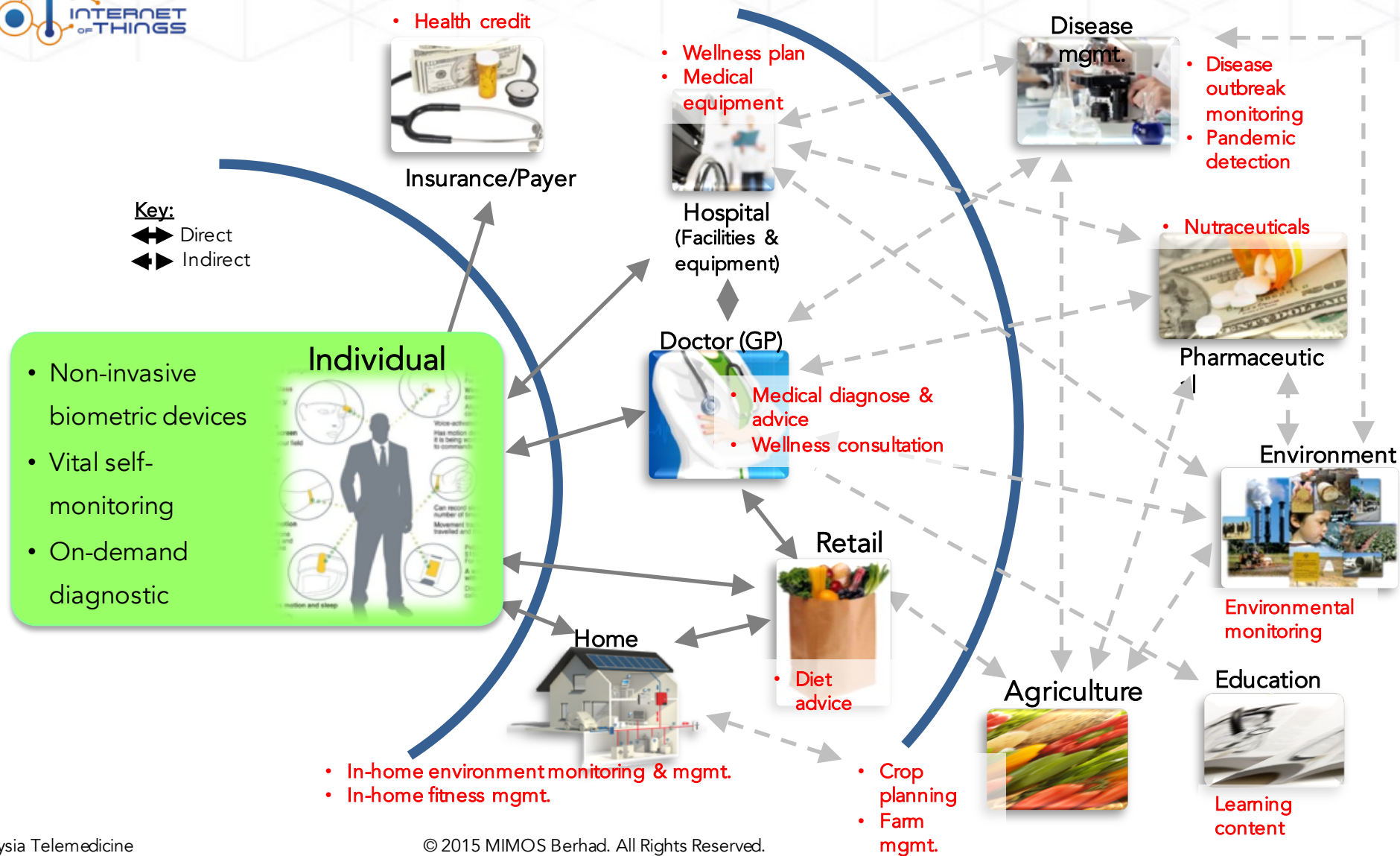
- Competition
 - Healthcare services
 - Healthcare professional
- Chronic Disease treatment
- Independent Aging folks

- Higher health awareness
- Lifestyle based fitness program

- Increase demand for nutrition led to hormone driven production, lead to more disease

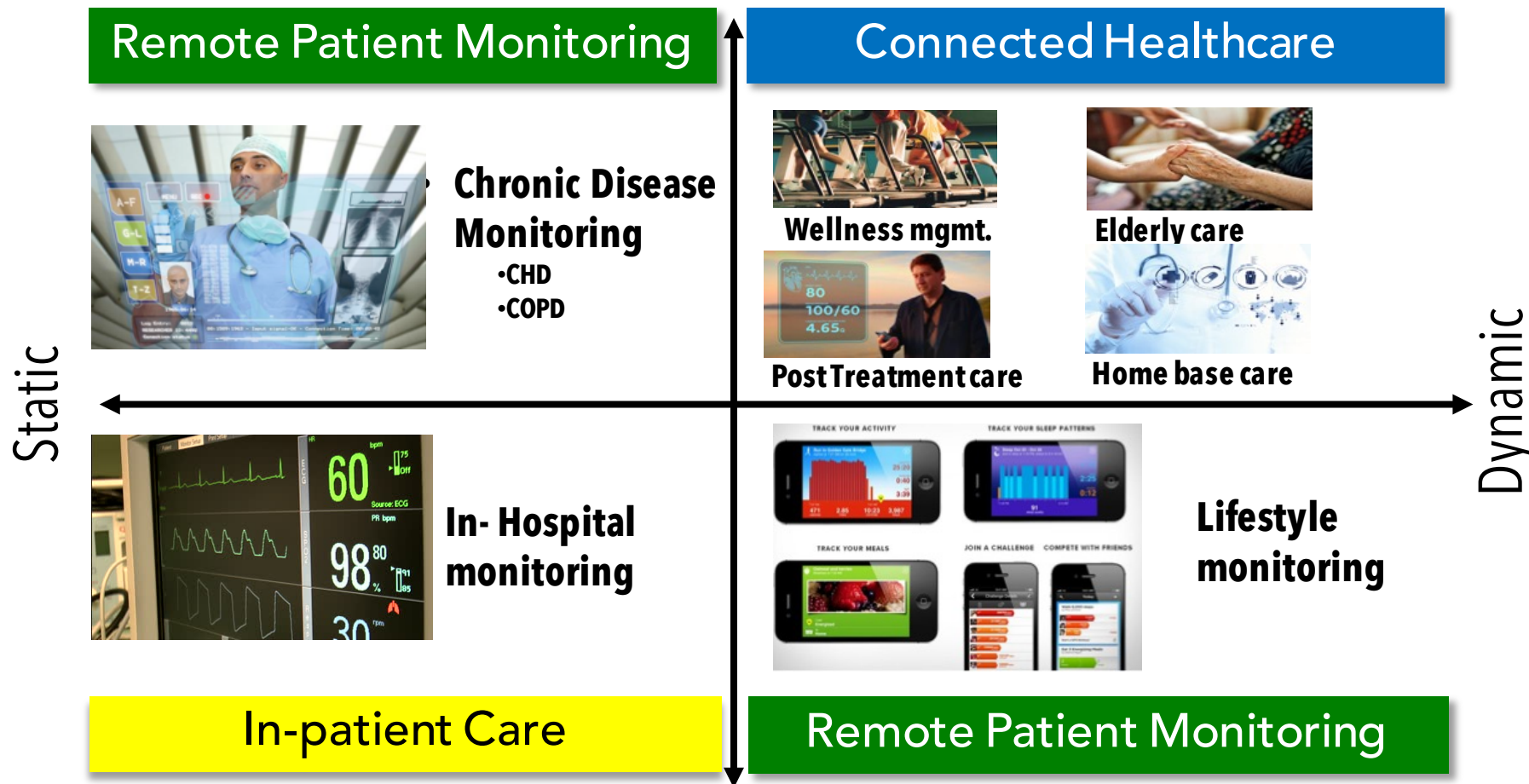
- Convenience of connectivity creating lifestyle-diseases
 - Heart Disease, Diabetics, Kidney Failure
- Sharing of knowledge
 - Medical
 - Nutritional info.





	As-Is	Foreseeable Future	Utopia
	Location-bound & disease treatment	Preventive treatment	Wellness mgmt. : Self-Care & Self Diagnose
2 Patient	<ul style="list-style-type: none"> Disease management 	<ul style="list-style-type: none"> Preventive 	<ul style="list-style-type: none"> Wellness management
3 Doctor	<ul style="list-style-type: none"> Diagnose 	<ul style="list-style-type: none"> Early treatment 	<ul style="list-style-type: none"> Prognoses
1 Hospital provider	<ul style="list-style-type: none"> In-patient care Competing for specialized doctors 	<ul style="list-style-type: none"> Remote patient monitoring 	<ul style="list-style-type: none"> Home-based care Sharing of knowledge-based doctors Medical knowledge as a service
5 Pharmaceutical	<ul style="list-style-type: none"> Generic drug 	<ul style="list-style-type: none"> Personalized drug 	<ul style="list-style-type: none"> Targeted medication Nutraceuticals
4 Insurance / Payer	<ul style="list-style-type: none"> Risk-based premium 	<ul style="list-style-type: none"> Personalised fitness-based premium 	<ul style="list-style-type: none"> Health credit

Knowledge



Disruption of Hospital Services

In-patient care

Remote patient monitoring

Connected Healthcare

Static - Info	<ul style="list-style-type: none"> Hospital Resource planning Disease codified database 	<ul style="list-style-type: none"> Vital sign monitoring <ul style="list-style-type: none"> Health trend monitoring In-home environment monitoring & mgmt. Diet monitoring & mgmt. 	<ul style="list-style-type: none"> Lifestyle activities monitoring
Dynamic-Info		<ul style="list-style-type: none"> Environmental monitoring 	<ul style="list-style-type: none"> Early epidemic containment Ambient Intelligence
Static - Knowledge		<ul style="list-style-type: none"> Drug alert & mgmt. sys : Medication tracking 	<ul style="list-style-type: none"> Diet consultation <ul style="list-style-type: none"> In-home fitness mgmt. consultation
Dynamic-Knowledge			<ul style="list-style-type: none"> Integrated emergency response sys. <ul style="list-style-type: none"> e-Remedy

Scenario ① : Serving the "Worried Well"



"Worried well" vital sign monitoring

- Weight
- Blood pressure
- Glucose
- Cholesterol
- Activity level

Benefits:

- Monitor & motivate
- Achieve individuals' goals
- Access personal fitness info anywhere
- Enhance trainer' services



New Services:



Scenario 3 : Elderly care



- Independent living
- Mobility

Basic life monitoring:

- Bed pressure (sleep)
- Critical parameters sensor
- Fall detection
- Gas/Water sensor
- Emergency sensor

Benefits:

- Involve family members
- Allow remote analysis & care
- Provide integrated view
- Encourage early detection
- Reduce costs



New Services



Family
care
givers



Elderly
monitoring
sys



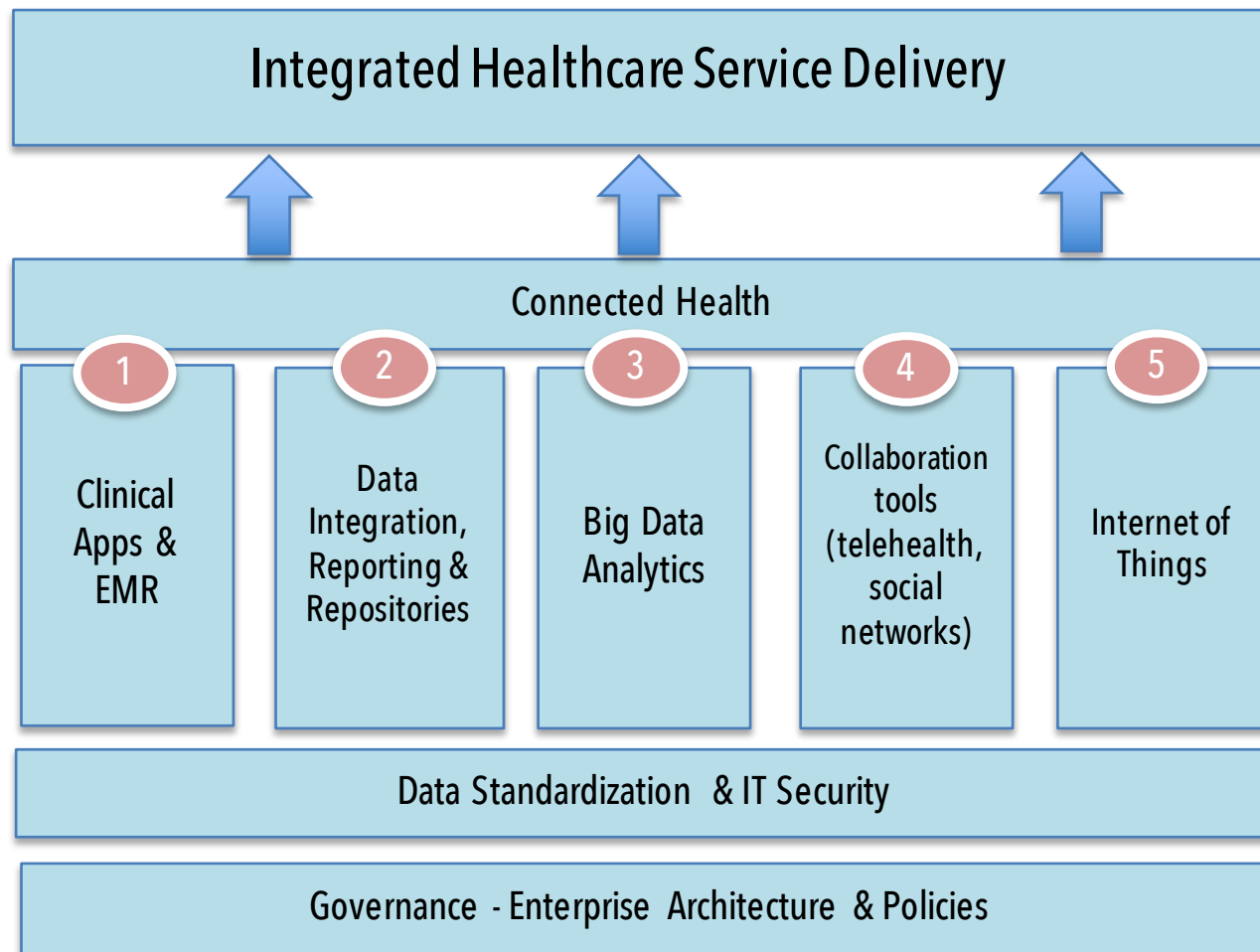
Diet &
Wellness
svc.



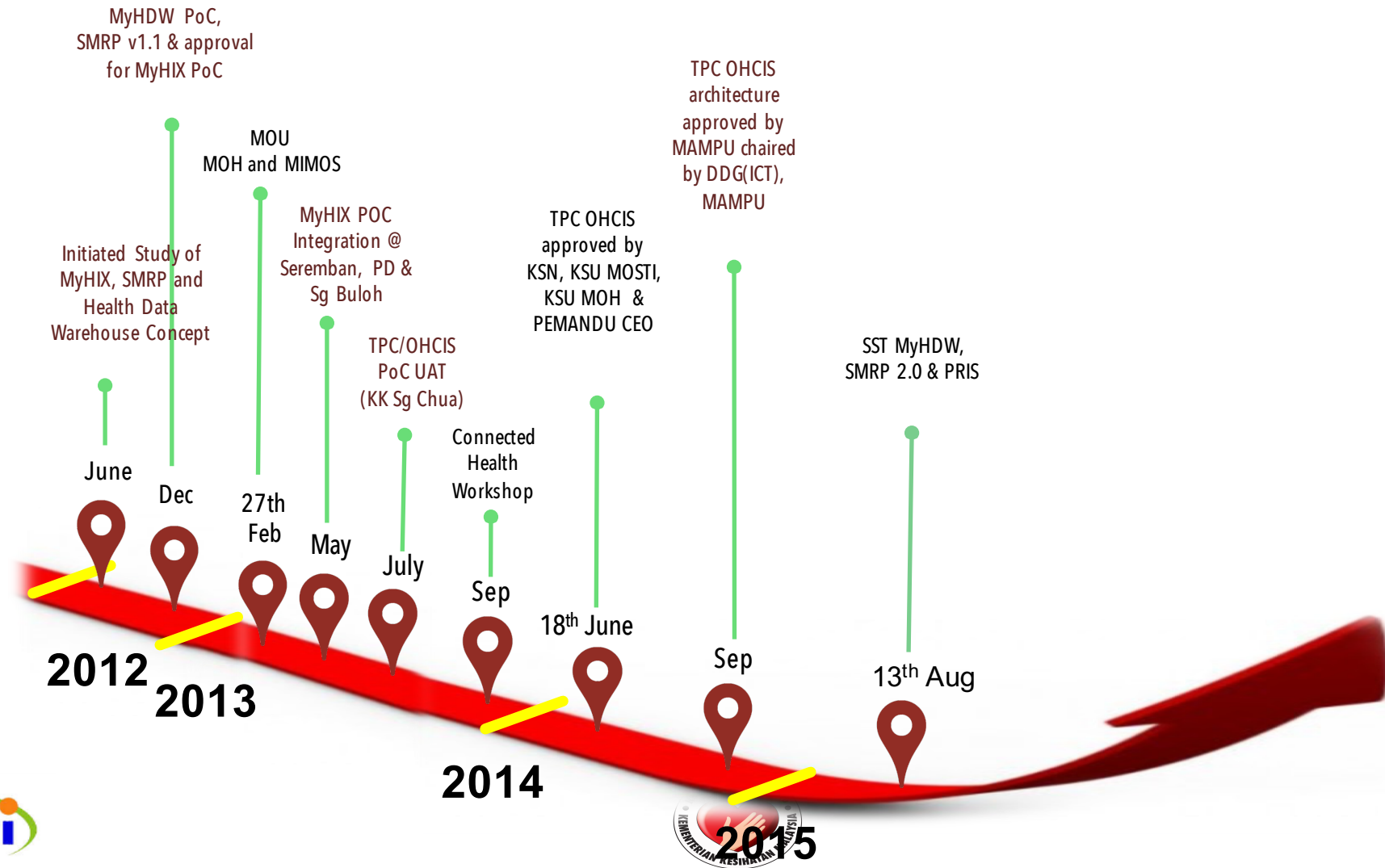
Disease mgmt.
svc, Healthcare
provider

	Total population (000s)	Healthcare spend as % of GDP	Per capita healthcare spend	Hospital beds per 1000 citizens	Practicing physicians per 1000 citizens	Physician payment schemes*		
						Primary care	Specialist ambulatory	Secondary care
Australia	21,016	8.7	3445	3.8	3	FFS	FFS	Salary
Canada	33,095	11.4	4478	3.3	2.4	FFS	FFS	FFS
England	61,412	9.8	3487	3.3	2.7	Salary/ Cap/ FFS	Salary	Salary
France	61,840	11.8	3978	6.6	3.3	FFS	FFS	Salary
Germany	82,772	11.6	4218	8.2	3.6	FFS	FFS	Salary
Singapore	4,737	3.9	2086	3.2	1.7	FFS	Cap	Salary
Spain	44,311	9.5	3067	3.2	3.8	Salary/ Cap	Salary	Salary
US	304,228	17.4	7960	3.1	2.4	Salary/ Cap/ FFS	FFS	Mixed

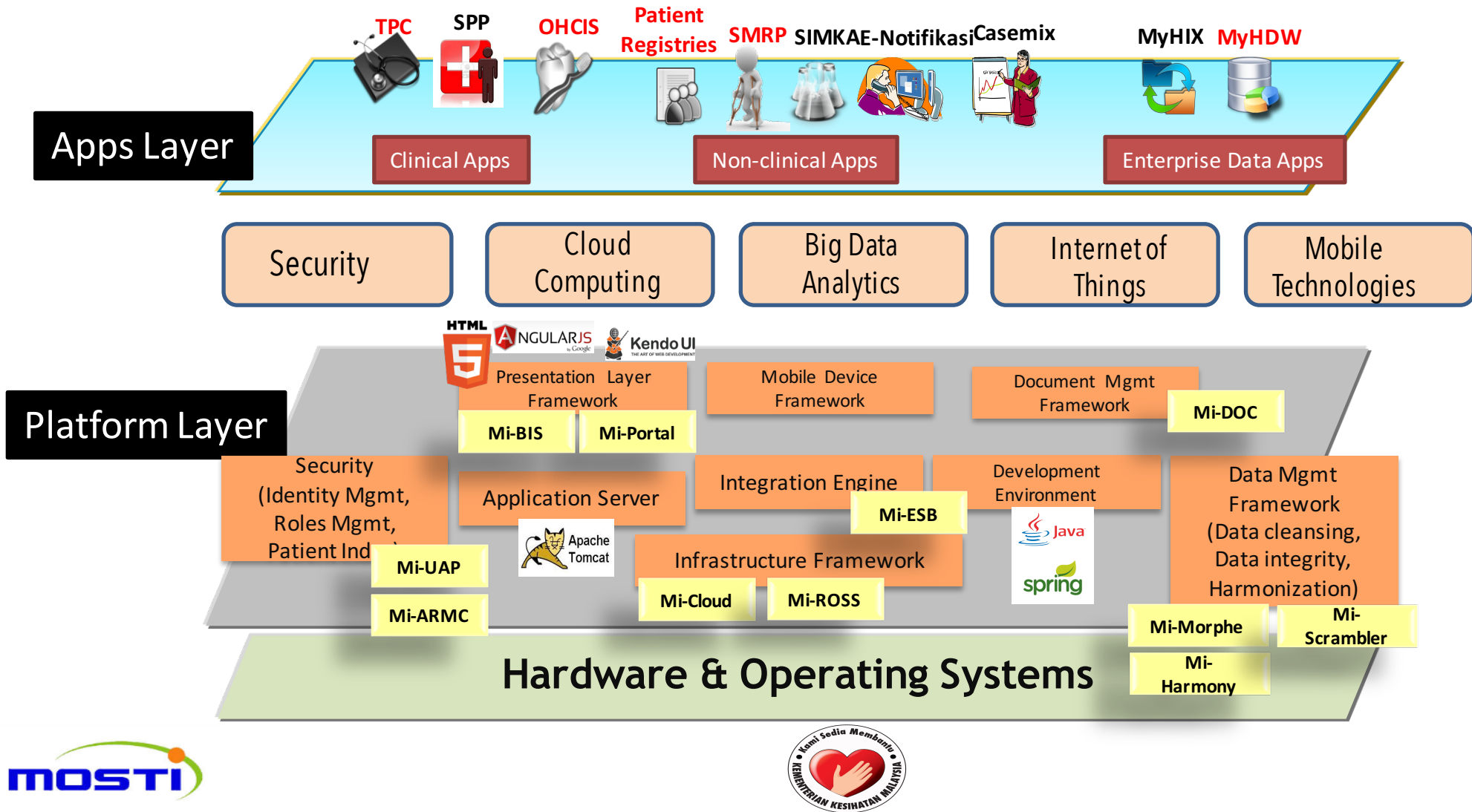
5 Healthcare IT Application pillars of Connected Health



MIMOS Healthcare IT Journey with MOH



MOH Healthcare IT: Towards Connected Health



End Note...

- MIMOS as Technology Partner for MoH:
 - Working together with MoH to create and drive the Strategic Roadmap of Connected Healthcare
 - Sustainable R&D Partner – New research output to be shared with MoH
- Open Innovation Platform:
 - To encourage local industry participation
 - To protect MoH/Government investment



Thank You

