Strategic ICT Roadmap for Malaysia

The Strategic ICT Roadmap for Malaysia was mooted by the National Information Technology Council (NITC) and re-iterated in the Ninth Malaysian Plan.

The Malaysian government has recognised that ICT would serve as a foundation condition that would transform Malaysia from a P-based economy to a K-based economy. In the 6th Malaysian Plan (RMKe-6), ICT was emphasised as an enabler mainly in the manufacturing sector. This was further build upon with the introduction of the National Information Technology Council (NITC). The primary function of the NITC is to ensure that ICT is well integrated in the socio-economic fabric of the nation.

Under the 7MP, The National Information Technology Agenda (NITA) was formulated to realise the core objectives of NITC. NITA was seen as a key catalyst for transforming Malaysia into a value-based economy through the development of the talent, infrastructure and applications to benefit the Malaysian society. During this period, the Multimedia Super Corridor (MSC) Malaysia project was launched to create a world class environment for attracting the best multimedia enterprises to use this region as the test bed for cutting-edge ICT applications. Prominence was also given to E-Initiatives (e.g. E-Economy, E-Public Services, E-Community, E-Learning and E-Sovereignty) under the Seventh Malaysia Plan. Multimedia University was established to meet the human capital and research capabilities in the information technology and multimedia.

The expansion of ICT services among the general public and rural areas were given priority under the 8MP. The National Broadband Plan was formalised for the planned operationalisation of broadband access across the country. The Malaysian Information Communication and Multimedia Services (MyICMS) 886 Blueprint was introduced in 2005 for the orderly integrated development three converging technologies – cellular telephony, Internet and broadcasting.

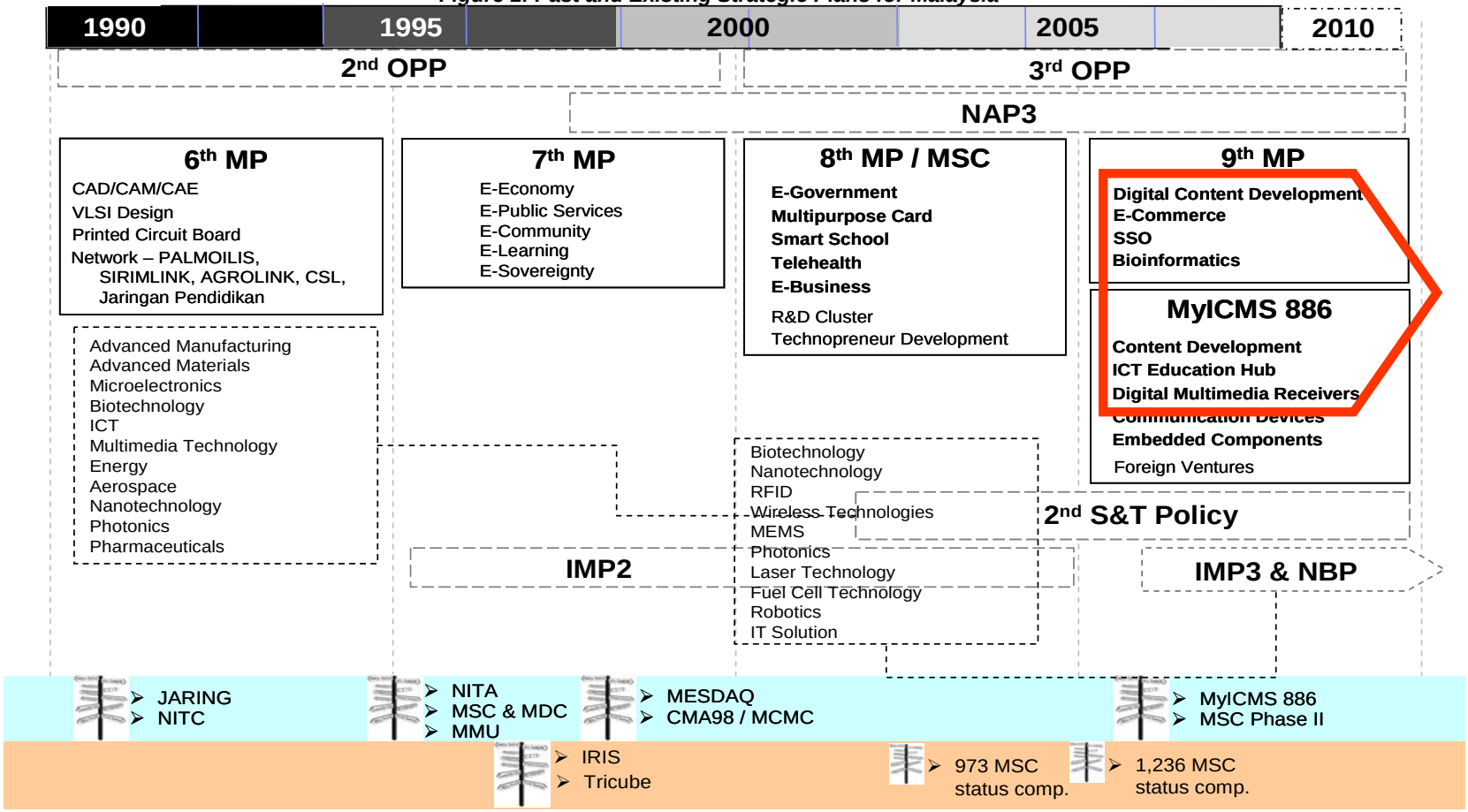
MSC was further given priority under the 8MP with the introduction of the following flagships:

- Electronic Government;
- National Multi Purpose Card;
- Smart School
- Telehealth;
- E-business;
- R&D Clusters; and
- Technopreneur Development.

Under the 9MP, ICT development is seen as an important strategic driver for positioning Malaysia as competitive knowledge based economy and global ICT and multimedia hub. Thus, the focus of the Ninth Plan was to expand the existing communications network across the country through the phased implementation of the MyICMS 886, reducing the digital-divide, developing the existing cybercities and developing new ones (MSC Phase II), fostering new growth sectors such as bioinformatics. Under the 9MP, development ICT talent and enhancing information security continue to be given high priority in the development of the information society.

In summary, all the past and present national plans were to provide a sound platform for Malaysia to transform into a knowledge-based society and value-driven economy. The National Strategic ICT Roadmap will provide a framework to enhance the productivity of key sectors of the economy and promote the development of new ICT-based and knowledge-intensive industries.

Figure 1: Past and Existing Strategic Plans for Malaysia



The National Strategic ICT Roadmap has identified three Technology Focus Areas that could advance Malaysia economically and technologically over the next ten years and beyond, and could help fulfil the tenets of Vision 2020: (i) Wireless Sensors Networks, (ii) Predictive Analytics; and (iii) 3-Dimensional Internet.

These technologies were evaluated based on their capability to leverage on the strengths and uniqueness of Malaysia vis-à-vis other economies globally, emerging technologies and global societal issues, as well as the current ICT plans that the country has produced in recent years. As a start, five areas of greatest impact were identified namely smart agriculture, logistic systems, financial services, halal and manufacturing sectors.

To create a robust and sustainable ICT sector around the three identified focus areas, Malaysia needs a complete ecosystem which would translate into actionable programs in the areas of education, R&D and commercialisation, infrastructure and industry development, as well as attracting investments.

An effective, coordinated feedback and control mechanism is an equally critical building block in the ecosystem for the three technology focus areas. Hence, the Roadmap is aided by a set of specific, easily recognisable signposts to indicate significant events that will influence the possibility for an envisioned future occurring. These actionable signposts are important stepping stones in enhancing the likelihood of raising the country's regional presence and global competitiveness in key economic sectors.

The National Strategic ICT Roadmap will provide a framework to enhance the productivity of key sectors of the economy and promote the development of new ICT-based and knowledge-intensive industries.

The key recommendations of the *National Strategic ICT Roadmap* are inputs for the formulation of strategic policies, programmes and plans to intensify Malaysia's transformation to a knowledge-based economy. There are three strategies for Malaysia to pursue:

Strategy 1: Be a global leader in 3 Technology Focus Areas

Strategy 2: Rationalise institutional arrangement and accelerate K-Based Ecosystem

Strategy 3: Use Signposts and Vision Areas to manage opportunities and risks

Strategy 1: **Be a global leader in 3 Technology Focus Areas**

Malaysia has achieved reasonable success in promoting and developing ICT since the Sixth Malaysian Plan (1990-1995) but in order to lead in the next wave of ICT revolution, Malaysia needs to focus on 3 Technology Areas to optimise resources and achieve Vision2020.

(i) **Wireless Sensors Networks** (ICT infrastructure)

A wireless sensor network (WSN) is the fundamental element to the concept of pervasive or ubiquitous computing, making surroundings "smart" by linking advanced sensors with computer networks, blending the physical with the virtual.

WSN consists of spatially distributed autonomous devices using sensors to cooperatively monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants, at different locations.

Types of WSN Technology	Areas of application
• Acoustic	• Environmental monitoring
• Biochemical	• Security management
• Electromagnetic	• Industrial safety
• Mechanical	• Health / Medical applications
• Molecular	• Weather prediction
• Optical	• Energy applications
• Radiation	• Logistics monitoring
• Thermal	• Traffic control
	• Precision agriculture

(ii) **Predictive Analytics** (ICT info-structure)

Predictive Analytics harnesses technologies and services to make predictions about future events from large amounts of structured and unstructured data using statistics and data mining techniques.

Such predictions rarely take the form of absolute statements, and are more likely to be expressed as values that correspond to the odds of a particular event or behavior taking place in the future.

Types of Technology	Areas of application
• Bio-medical • Weather and disaster prediction • Speech recognition and language translation • Prediction markets • Communications network pattern analysis	• Banking services • Financial forecasts • Consumer and retail research • Healthcare diagnostic • Logistics management • Weather and environmental prediction

(iii) **3-Dimensional Internet** (Multimedia Digital Content)

3D-Internet is a set of emerging technologies for creating, distributing, and rendering three dimensional scenes and animation in immersive, multi-user, online environments.

Types of Technology	Areas of application
• Virtual worlds, virtual reality and metaverse • Image rendering & data visualisation • Online game architecture • Multimedia • Simulation • Wearable computing • Advanced data mining & artificially intelligent inference engines	• Education content • Industrial training • Marketing assistance • Exploration • Disaster simulation • Rehearsal of corporate initiatives • Entertainment • Tourism

Strategy 2: **Rationalise institutional arrangement and accelerate K-Based Ecosystem**

To ensure a robust and sustainable ICT ecosystem, there is a need to rationalise the institutional arrangement, and accelerate development of talent, infrastructure, innovation and commercialisation capacity.

Institutional Coordination

- Formation of a Pro tem Committee to manage the *National ICT Strategic Roadmap* until an integrated ICT governing authority is established.
- Development and execution of the ICT Implementation Plan.
- Monitor and update recommended signposts.
- Participation in international bodies and/or events dictating standards in relation to the TFAs.

Talent Pool and Capability Development

- Create a "triple helix cluster" around the TFAs.
- Establish Academy for coordinated development of the TFAs among key stakeholders.
- Re-skill / Training of existing talents.
- Import Knowledge Workers to increase talent pool and support immediate development of the TFAs.

Infrastructure Development

- Align and support the MyICMS 886 and the National Broadband Plan.
- Establish a central three TFAs Knowledge Repository Shared Facility.
- Educate public on IP and copyright values.

Commercialisation and Growth Acceleration

- Communicate and educate industry on the *National Strategic ICT Roadmap.*

- Package R&D and commercialisation incentives of the TFAs.
- Facilitate global market penetration for Malaysian companies and match IPs with VCs and global markets.
- Realign existing business incubations around the TFAs.

Strategy 3: **Use Signposts and Vision Areas to manage opportunities and risks**

This *National Strategic ICT Roadmap* provides a methodology for continuous monitoring with feedback signposts so as to better manage opportunities and risks associated with (disruptive) technology and its rapid impact on market. The technology landscape and key sectors are being transformed by rapid innovation and increased convergence in new technology. This is expected to intensify in the coming years and will continue to impact Malaysia's innovative capacity, competitiveness and socio-economic development. The future global technology landscape was examined to develop vision areas around the Technology Focus Areas in three time periods (near, intermediate and deep future). For each of the vision areas, consideration was given on the implications and applications might be on key sectors of the Malaysian economy.

The back-casting method was used to identify potential events (milestones) along the future timeline that will impact the Technology Focus Areas and the key sectors of the Malaysian economy. These key signposts are important in increasing the likelihood of raising the regional and global presence and competitiveness of Malaysia in key sectors. A final, much smaller, subset of the seventy-one candidate signposts was selected. The final signposts are those that, if they occur, could have the largest impact on the three Technology Focus Areas and for Malaysia.