

Roadmap for
Industrialised
Building
System
(IBS)
in Malaysia 2011-2015



Ministry of Works, Malaysia

ISBN....

First Edition 2010

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Message from the Minister of Works, Malaysia



Over the past five years since the inception of the Ninth Malaysia Plan, the construction industry in Malaysia has been contributing about 3.5% of the GDP of the nation. Given the current strength circa 9% of the total workforce in Malaysia and in anticipation of the Tenth Malaysia Plan that starts next year, the construction industry has the potential to spearhead more rigorous initiatives and raise the ante to make the industry more sustainable, deliver higher quality products and demonstrate stronger resolve for speedy completion of projects. The building and construction industry is undoubtedly technologically-driven with the integration and adoption of new approaches and system. It is pleasing to note that the publication of the IBS Roadmap 2011 – 2015 heralds new dimensions and charts the departure in the construction sector in the country from the conventional method of construction to a more systematic and an environmentally-friendly way of construction.

The IBS construction is synonymous with the green technology. In this regard, the Prime Minister had made a pledge in Copenhagen Summit in December 2009 that Malaysia is committed to reducing Greenhouse Gasses (GHGs) emissions by 40% up to the year 2020. This roadmap serves to chart the journey in the construction sector as when we promote and undertake IBS we are also subscribing to the green initiatives.

As we are aware, the government is forging ahead with its transformation programmes by taking Strategic Reform Initiatives (SRIs) to drive the New Economic Model (NEM). One of the cardinal principles in the SRIs is closely related to the construction industry. The vibrant growth of the construction industry is pivotal for overall achievement of the economy and the adoption of IBS is the right instrument to propel the growth to the new heights.

Finally, I urge all the agencies under the ministry and the IBS industry players in the private sector to work closely and contribute positively in order to realize the IBS initiatives as spelled out in the roadmap. Together we build a new foundation for the construction industry in Malaysia.

Dato' Shaziman bin Abu Mansor
Minister of Works, Malaysia

Foreword from Secretary General, Ministry of Works, Malaysia



The construction industry in Malaysia has ushered in fresh initiatives and approach, with the advent of Industrialized Building System (IBS) in the government projects. It is the way forward to respond to the fast changing environment in the construction sector, especially as the country is headed towards engaging a more prominent role locally, as well as globally. The adoption of IBS in public and private sector projects is crucial and timely.

The publication of the IBS Roadmap 2011 - 2015 is designed to strategize and address the challenges in the application of IBS in the construction sector whose holistic aim is to spawn a technologically-pervasive and innovative construction fraternity. It is the blueprint to ensure that the critical success factors in the construction industry that emphasize on productivity, quality, human resources and knowledge are achieved in line with the recently outlined Strategic Reform Initiatives (SRIs) by the government. One of the initiatives in the SRIs is to develop quality workforce and reduce dependence on foreign labour. The use of IBS is one of the mechanisms to enhance the construction industry and explicitly render the concomitant reduction of foreign workers.

It is hoped that the roadmap will steer the right direction for fundamental changes in the construction industry and provide comprehensive framework of strong resilience for the nation to attain a high-income economy status by the year 2020.

Datuk Thomas George
Secretary General
Ministry of Works, Malaysia

Message from the Chief Executive of CIDB Malaysia



Since the launch of the IBS Roadmap in 2003, progress of the activities identified in the Roadmap was generally on track. Policy issues have been resolved and implemented, while most of the programmes have been achieved. Yet, the response to industrialize the Malaysian construction industry has been lukewarm.

Annual data on projects indicates that the private sector has built more residential projects than the Government. Hence, to achieve an overall industrialized construction industry, participation from the private sector is equally important.

The IBS Roadmap 2011-2015, is a well structured document to industrialize the construction industry with focus on the private sector while sustaining the public sector momentum on the usage of IBS in their projects.

CIDB wishes to acknowledge the continuous support and guidance by Y.B Dato' Shaziman bin Ahmad Mansor, the Honorable Minister of Works, Malaysia, in the formulation of this Roadmap. The guidance and encouragement from Y.Bhg. Datuk Thomas George, Secretary General, Ministry of Works, Malaysia has been crucial to the preparation of this document.

Sincere appreciation is also extended to many busy individuals who kindly took the time to share their perspectives and inputs during the formulation of this Roadmap.

Datuk Ir. Hamzah Hasan
Chief Executive of CIDB Malaysia

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Abbreviations And Definitions

CIDB	Construction Industry Development Board
CIMP	Construction Industry Master Plan
GoM	Government of Malaysia
IBS	Industrialised Building System
IBSO	Industrialised Building System Organisation
ICU	Implementation Coordination Unit
JKR	Jabatan Kerja Raya or Department of Works
KKR	Kementerian Kerja Raya or Ministry of Works
KPI	Key Performance Indicator
KSN	Setiausaha Negara
KSU	Ketua Setiausaha
MC	Modular Coordination
MoHA	Ministry of Home Affairs
MHLG	Ministry of Housing and Local Government
MoHR	Ministry of Human Resources
MoW	Ministry of Works
MS1064	Modular Coordination Guideline for Building Designs
PPP	Public-Private Partnership
Pusat IBS	IBS Centre
REHDA	Real Estate and Housing Developers' Association of Malaysia
UBBL	Uniform Building By-Laws

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Executive Summary



Executive Summary

In 1966, the Government of Malaysia (GoM) launched the first two Industrialised Building System (IBS) projects in Malaysia – the Pekeliling Flats in Kuala Lumpur and the Rifle Range Road Flats in Penang.

Within five years of the incorporation of Construction Industry Development Board (CIDB), the IBS Strategic Plan was launched in 1999 to promote the usage of IBS in the construction industry. Subsequently, the IBS Roadmap 2003-2010 was introduced in 2003. The commitment to IBS was further reaffirmed when the IBS Roadmap was endorsed by the Cabinet¹ as the blueprint to industrialise the construction sector by 2010.

However, even after nearly four decades since its introduction in 1966, it appears that the usage of IBS in Malaysia is still low compared to that of other developed countries.

Why Do We Need IBS?

The desired outcomes for implementing IBS in Malaysia can be broadly summarised as follows: to achieve quality, faster completion time and fewer site workers².

The reduction of on-site workers compounded with faster completion time is a main draw for policy planners faced with the daunting task of reducing reliance on foreign workers in the country.

The GoM recognizes that IBS can be quickly introduced in public sector projects; as a large single buyer, it can influence and dictate the method of construction. The GoM achieved this by issuing a Treasury Circular in 2008 that mandated ALL GoM projects to attain no less than 70% IBS content³ for public sector projects.

With the public sector now on the IBS track, the next opportunity and challenge is to convince private sector project owners to increase usage of IBS.

1 Endorsement was given by the Cabinet on 29 Oct 2003

2 Source : Construction Industry Master Plan, page 198

3 Measured using the method in IBS Scoring Manual developed by CIDB

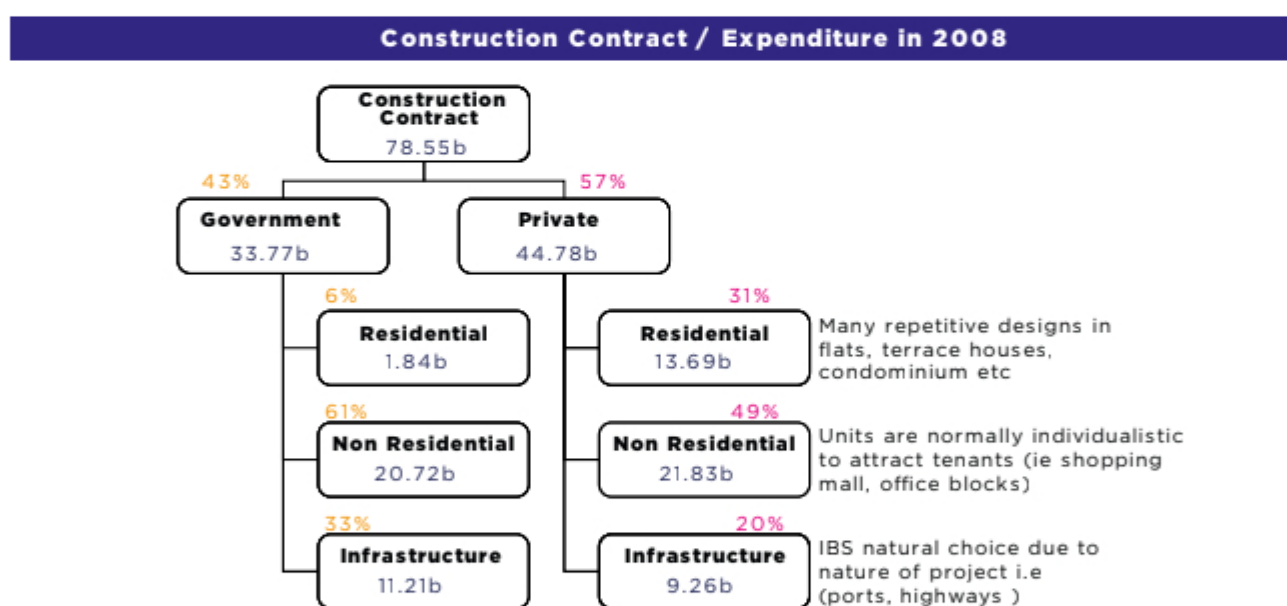
Where Are We?

At least 291⁴ public sector projects were carried out using the IBS method of construction under the 9th Malaysia Plan, constituting a total project value in excess of RM10.0b. RM6.0b worth of IBS projects were carried out directly under the purview of Jabatan Kerja Raya (JKR), while the remaining RM4.0b worth of IBS projects (termed as “non-JKR”) were out-sourced to contractors in the private sector.

The Ministry of Education is the largest IBS construction project buyer with the rapid construction of secondary and primary schools, worth a total of RM2.4b. The private sector accounts for 55-60%⁵ of the total project value carried out by the entire construction industry.

Hence, to achieve an overall industrialised construction industry, the buy-in of the private sector is equally important. Residential projects such as flats, condominiums and terrace houses have high IBS potential due to its repetitive nature. The private sector built RM13.7b worth of these residential projects, compared to only RM1.8b by the public sector. If more of the private sector can be convinced to adopt IBS, the resulting outcomes will be manifold.

Refer to the following diagram.



Notes and Assumptions:

1. Source of information from CIDB, June 2009
2. The above scenario is based on construction contract value for the year 2008
3. Residential includes quarters, terrace houses, bungalows, flat, condominiums, dormitory etc
4. Non residential includes shops, office, business complex, factories, warehouse, factories, hotels and police stations etc
5. Infrastructure such as tunnels, bridges, pier, jetties and highways are using many IBS components due to nature of project

⁴ Source: Bahagian Pemantauan Agensi & Kemahiran (BPAK), Ministry of Works (Apr 2010)

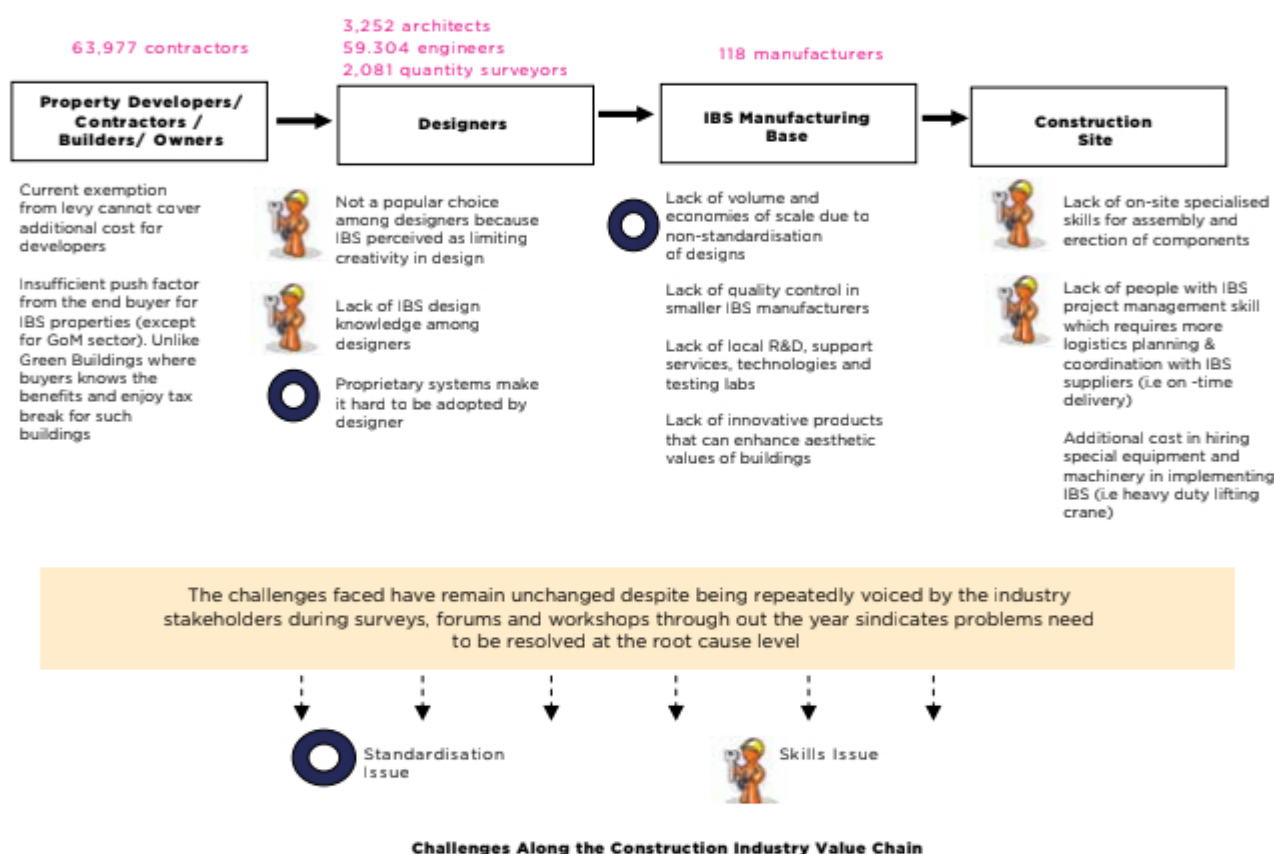
⁵ Based on average from 2005 to 2008 by CIDB

What Is Holding Back Adoption Of IBS Among The Private Sector?

To determine this, CIDB interviewed various stakeholders in the industry.

Higher cost; lack of standardisation; inadequate supply of skilled workers; and accessibility to under-priced and easily-trained foreign workers were cited as major reasons for low adoption of IBS in the private sector. The diagram below summarizes the barriers to adoption.

The major challenges faced by the industry have remained unchanged through the years, indicating that the root causes of the issues have not been resolved:



- Contractors are slow to change from the current labour intensive, low-skilled, low value-adding model that has been prevalent in the construction industry.
- Cost to adopt IBS remains high due to lack of standardisation

The labour issue is not specific to the construction industry alone. According to the National Economic Model (NEM), the share of skilled labour has declined across industries. In many instances, employers do not pay for skills, relying instead on a readily available pool of unskilled and under-priced foreign workers (made possible by government policies) to generate profits from production of low value-added products and services⁶.

6 National Economic Model (NEM), NEAC April 2010

In other countries, minimal Government intervention is required to steer the private sector to adopt IBS. The high cost of labour would typically drive the industry to opt for more productive and less labour- intense methods of construction such as IBS.

In the long term, a similar scenario for Malaysia is also likely, given that foreign workers cannot remain perpetually low and under-priced. As their skills and productivity increase, their wages would also reflect this. Hence, the industry should be prepared for the imminent increase in labour cost.

Meanwhile, the cost of IBS components has remained high without the achievement of economies of scale. This has been perpetuated by the lack of standardisation of component specifications within the industry. Currently it is reported in the CIMP that IBS would cost an additional 10%⁷ above the conventional methods.

Efforts are currently being made to push for standardisation in sizes of commonly used products and for the propagation of modular coordination. The first step towards modular coordination is the change to metrication and the broader use of the metric system in the construction industry.

The other reasons for low adoption of IBS are discussed in greater detail in Chapter 2.

Where Do We Want to Be?

After assessing the current position, the CIDB believes that the IBS policy objectives⁸ should be reframed.

Four policy objectives have been identified as relevant and critical:

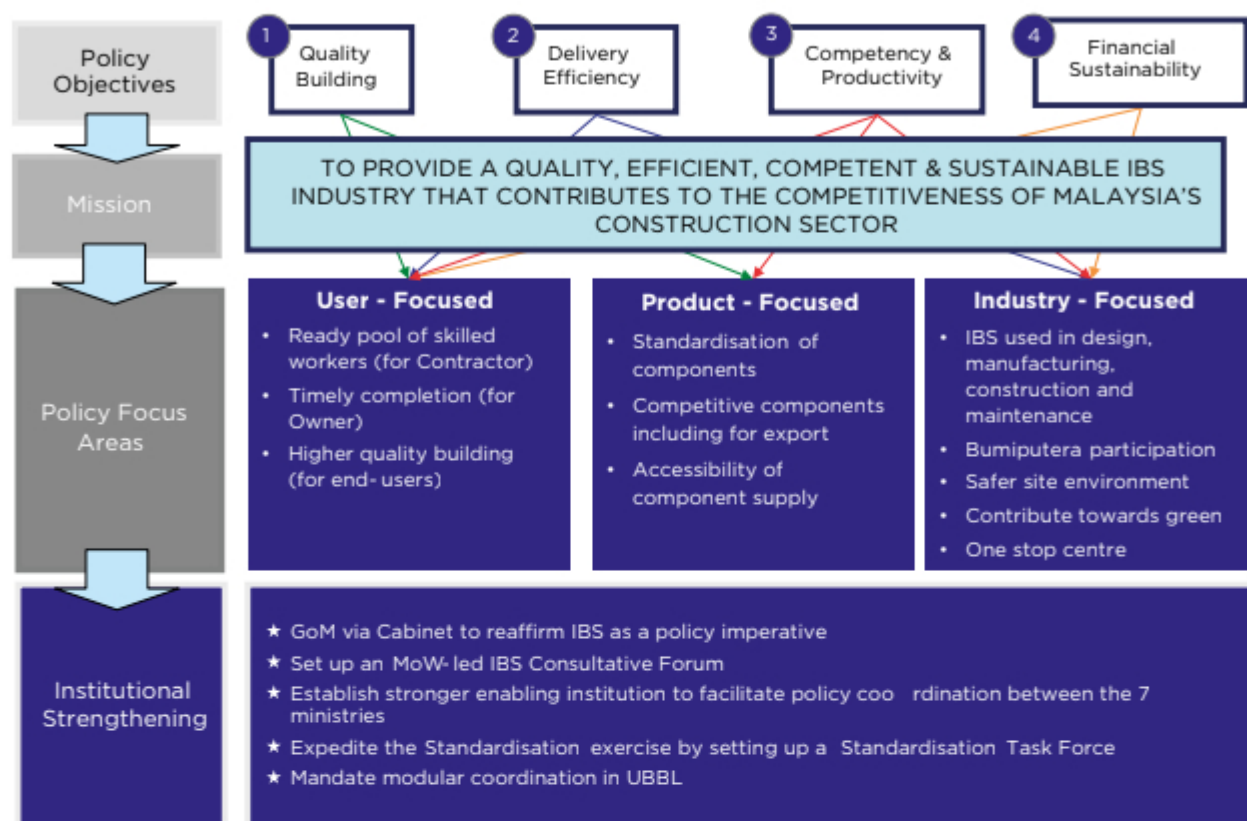
- Good quality designs, components and buildings
- On-time delivery and shorter project duration
- Skilled professionals and workers
- Financial sustainability

This translates to a mission that focuses on a viable and sustainable IBS industry that would contribute to the overall competitiveness of the construction industry.

⁷ Construction Industry Master Plan 2006-2015, Page 54

⁸ Policy objectives are the high level intended outcomes of implementing the new IBS Roadmap

The policy objectives were then cascaded into four primary areas for change, i.e. targeting the IBS user; product; industry; and institutional strengthening.



How Do We Get There?

The IBS journey to increase private sector participation will be confronted with many challenges and hard decisions must be taken.

It is a journey that will require:

- the steadfast commitment by the GoM to ensure follow-through
- the support of the private sector to comply with the required changes

Once the policies have been set, it is essential to strengthen the institutional machinery to execute the policies.

IBS Roadmap 2011-2015

The goals for the Roadmap are encapsulated below:

- To sustain the existing momentum of 70% IBS content for public sector building projects through to 2015
- To start a minimum IBS content for private sector building projects by 2015

These goals will be achieved through the implementation of 4 workstreams.

Workstream 1: Institutional Strengthening

To ensure the GoM's unwavering commitment towards IBS, once the policies are set, the executing engine must be able to push through the required changes. The decision-making process must be improved. The day-to-day entity needs to be empowered to be more authoritative, better resourced, policy-objective driven and be run as a user-friendly one-stop IBS organisation.

Workstream 2: Focusing on User

This workstream will address the need for a ready pool of both professionals and workers who are practising IBS and reduce reliance on foreign workers

Workstream 3: Focusing on Product

This workstream concentrates on the IBS product itself, including the standardisation issue.

Workstream 4: Focusing on Industry

This workstream is to energise the IBS component manufacturing industry, i.e. to ensure it remains innovative and supportive, with accreditation standards for the products and trained workers. The workstream will also focus on on-time delivery of projects.

Each workstream shall have a priority list of actions with clear description of why it is needed, who is leading it, how it is to be done and by when. Progress of implementation must be monitored and reported periodically. Corrective actions must be taken when and where necessary so that original targets can be met based on changing circumstances.

Summary of Action Plans

There are 2 broad actions and 35 specific actions which the GoM will pursue in order to intensify the adoption of IBS in the construction sector.

Action Plan 1:

The Roadmap will be implemented under four workstreams of institutional strengthening; IBS user; product; and industry.

Institutional Strengthening

Action Plan 2:

Strengthen institutional machinery to accelerate IBS adoption, first and foremost.

- 1 GoM via Cabinet to reaffirm IBS as a policy imperative
- 2 Setting up an MoW-led IBS Consultative Forum
- 3 Establish stronger enabling institution, i.e. an IBS Organisation (IBSO) to facilitate policy coordination between the 7 ministries (this is elaborated in Chapter 5)
- 4 Expedite the Standardisation exercise
- 5 Mandate modular coordination in Uniform Building By-Laws (UBBL)

- 6 Conduct Pilot Program with 3 selected target local councils, e.g. Dewan Bandaraya Kuala Lumpur (DBKL) and regional authorities, e.g. Iskandar Regional Development Authority (IRDA) to identify potential implementation issues and resolve them before a full nation-wide roll-out to other local authorities

Action Plan 3:

Improve decision making process by appointing a Director to head the IBSO, reporting to the Chief Executive of CIDB for administrative matters and the Board of CIDB for policy matters. The capability and capacity of IBSO management team will need to be strengthened at launch of the Roadmap.

Action Plan 4:

Upgrade Pusat IBS to the IBSO, making it an "IBS One Stop Centre"

Action Plan 5:

Set-up Customer Feedback Forum

Action Plan 6:

Prepare a 5-years Business Plan for the IBSO with a detailed operating budget

Action Plan 7:

Set up a Program / Project Management Office to promote and advocate the strategic initiatives under the new IBS Roadmap, primarily to the stakeholders and later nationwide

Action Plan 8:

Conduct organisational review of the existing Pusat IBS and manpower requirement study for the IBSO

Action Plan 9:

Finalise additional headcount and headhunt for Senior Management of IBSO

Action Plan 10:

Establish and monitor performance KPIs for IBSO

Action Plan 11:

Foster a closer working relationship with Green Building initiatives to increase weightage of IBS

Action Plan 12:

Communicate and educate the stakeholders on the new IBS Roadmap

Action Plan 13:

Implement and report progress of Roadmap and identify gap closing measures

IBS User Workstream**Action Plan 14:**

Collate next level of granularity of skills for IBS by developing a Skills Blueprint to identify training needs of the private sector, guided by a Skills Council (private sector input)

Action Plan 15:

Provide IBS training to the workforce

Action Plan 16:

Partner with industry to encourage Continuous Employment Training (CET). Commence training to professionals who can embed innovative usage of IBS into the design of buildings

Action Plan 17:

Increase emphasis on technical and vocational training colleges

Action Plan 18:

Examine the employment working terms in the industry to attract Malaysians back to the construction industry

Action Plan 19:

Carry out a Pilot IBS Apprentice Programme for a 3-year contract upon graduation

Action Plan 20:

Reduce reliance on foreign labour by propagating a levy system to achieve targets by skilled and unskilled foreign labour in line with industry needs

Action Plan 21:

Centralise oversight of foreign labour to enable better planning and monitoring

IBS Product Workstream

Action Plan 22:

Increase availability of quality controlled and standardised IBS products through the Standardisation exercise

Action Plan 23:

Promote ISO certification for IBS manufacturers

Action Plan 24:

Assess impact of IBS in private sector projects to convince the property developers that IBS is financially justifiable (i.e. quality, price, value)

Action Plan 25:

Mitigate the additional cost of using IBS method of construction with non-cash incentives (e.g. increased plot ratio)

Action Plan 26:

Recognise and promote National and Regional Champions in IBS

Action Plan 27:

Execute an "IBS Signature Project" that will allow participation from designers, manufacturers and contractors to work cohesively to deliver a showcase

Action Plan 28:

Change the perception that IBS means unattractive modular buildings (often concrete-based) by promoting other non concrete-based IBS products

IBS Industry Workstream**Action Plan 29:**

Set up Task Force to proactively review registration process and register all IBS manufacturers

Action Plan 30:

Facilitate the setting up of an IBS Manufacturer Forum / Association

Action Plan 31:

Conduct readiness assessment of the IBS manufacturers

Action Plan 32:

Support rapid transformation of IBS manufacturers with potential for innovation by facilitating financial and technical support for IBS manufacturers in innovative and technologically advanced areas, to encourage R&D

Action Plan 33:

Revisit incentive framework to promote innovation and facilitate timely access to funding for business activities

Action Plan 34:

Smoothen the process (from approval to IBS products arriving on-site) and help projects to be completed on-time (quick delivery) by reviewing supply chain (from plant to construction site) to find areas for improvements

Action Plan 35:

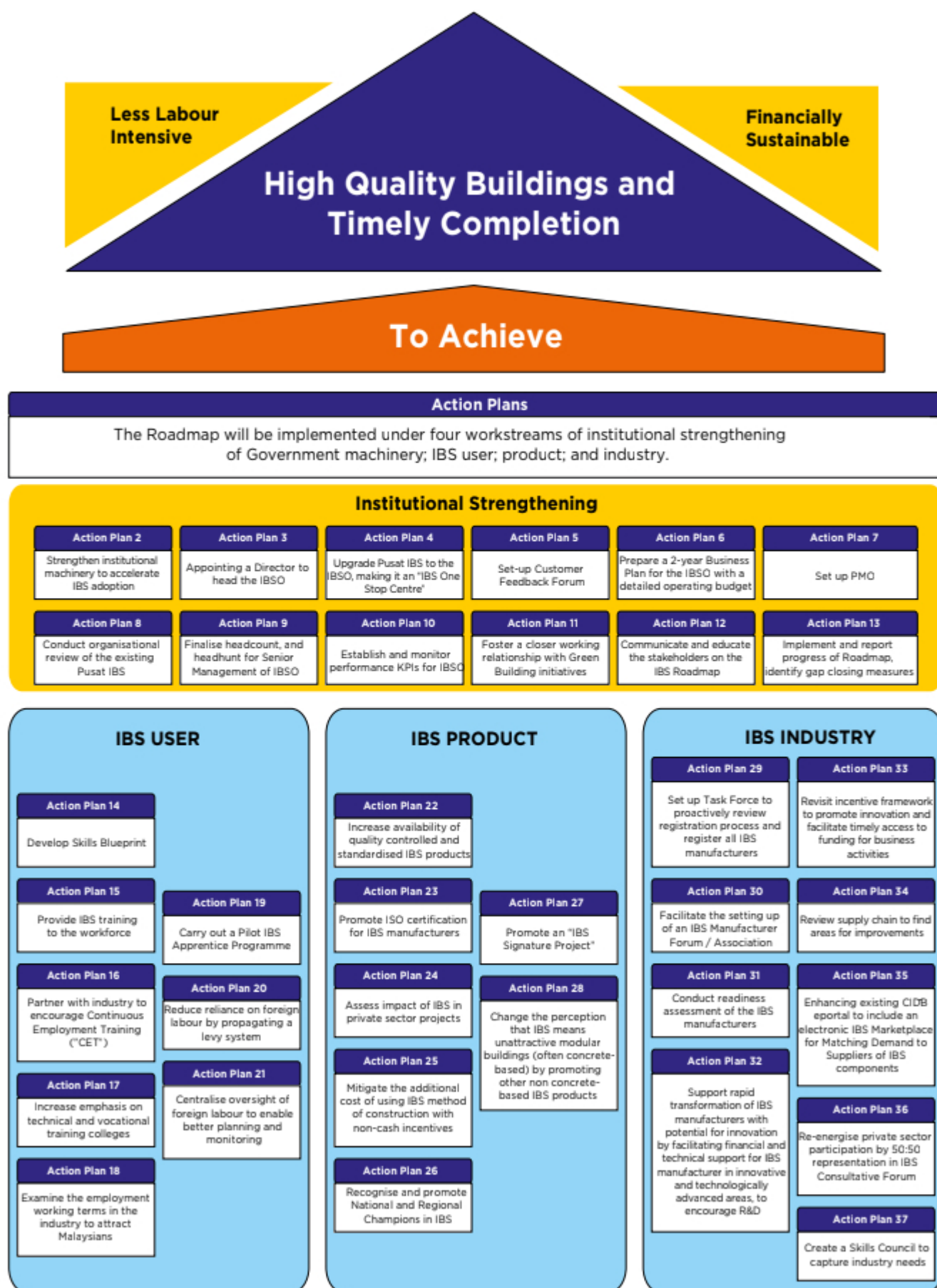
Improve speed to market by enhancing existing CIDB e-portal to include an electronic IBS Marketplace for Matching Demand to Suppliers of IBS components

Action Plan 36:

Re-energise private sector participation by 50:50 representation in IBS Consultative Forum. Consistent with the need to drive greater private sector participation, the MoW-led IBS Consultative Forum will be represented by the public and private sector

Action Plan 37:

Create a Skills Council to cater industry needs



Empowering To Drive Change

It is important to recognise that the adoption of IBS is not only determined by the efforts of CIDB and the Ministry of Works (MoW) alone but would also be the product of joint developmental efforts amongst 7 various ministries.

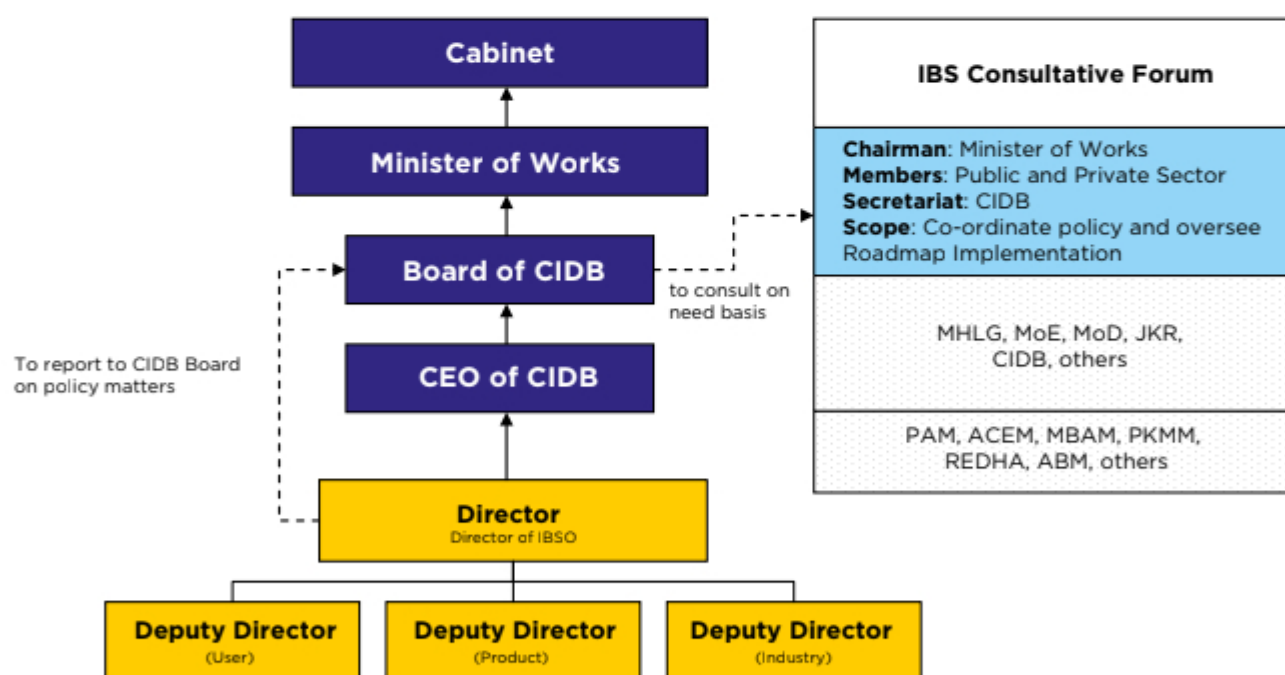
A crucial step for IBS adoption is the setting up of a MoW-led IBS Consultative Forum.

As the country's champion for IBS, the IBSO will forge a close working relationship with all the various Ministries and the private sector to achieve the Roadmap's objectives.

Going forward, there is a obvious need for a single, clear, accountable and strong organisation to expedite achievement of policy objectives for the betterment of the industry. Thus, a stronger enabling institution, i.e. an IBS Organisation (IBSO), is required to facilitate policy coordination between the 7 ministries.

The IBSO will consult the IBS Consultative Forum, chaired by the Minister of Works. The IBS Consultative Forum will be formed with equal representation from both the public sector and private sector to coordinate policies and oversee the execution of the Roadmap.

The IBSO will be headed by a director reporting to the Chief Executive Executive(CEO) of CIDB. The Director will be accountable to deliver the uphill tasks identified earlier. See Figure below.



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Chapter 1

Why is IBS Needed?



Why Is IBS Needed?

This Chapter examines the compelling reason for IBS implementation in Malaysia. This includes a discussion of the past efforts taken by the GoM to promote IBS in the construction industry. It also outlines the “must-haves”, namely sustainable policies, political will and the private sector participation to achieve the desired outcome.

1.1 Current Objectives of Implementing IBS in Malaysia

In 1966, the Government of Malaysia (GoM) launched the first two Industrialised Building Systems (IBS) projects in Malaysia – the Pekeliling Flats in Kuala Lumpur and the Rifle Range Road Flats in Penang. Between 1995 and 1998, the usage of pre-cast, steel and hybrid construction contributed to the rapid creation of numerous beautiful and quality structures. These include the construction of the Bukit Jalil Sports Complex and Games Village, the Petronas Twin Towers and the Light Rail Transit (LRT) lines.

The desired outcomes for implementing IBS in Malaysia can be broadly summarised as follows: to achieve quality, faster completion time and fewer site workers⁹.

Quality

The main objective of implementing IBS is to increase the quality of buildings for the end users. A building of quality may mean different things to different people. Some common definition of a quality building would be a building which is:

- Built using high quality components
- Aesthetically pleasant and serves the purpose it was built for
- Built in a cost effective and environmentally friendly way
- Does not give problems to the owners (such as leakage)
- Adaptable for future needs of the owners though renovation or extension works

Faster Completion Time

One of the noteworthy observations made by owners and builders of IBS buildings is the consistently shorter and faster completion of construction due to the usage of standardised pre-fabricated components and simplified installation processes. It is worthy to note that many Malaysian builders apply IBS for overseas projects. The need for speed is of utmost importance in completing an overseas project as speed reduces cost of overseas labour and reduces the financing cost of projects¹⁰.

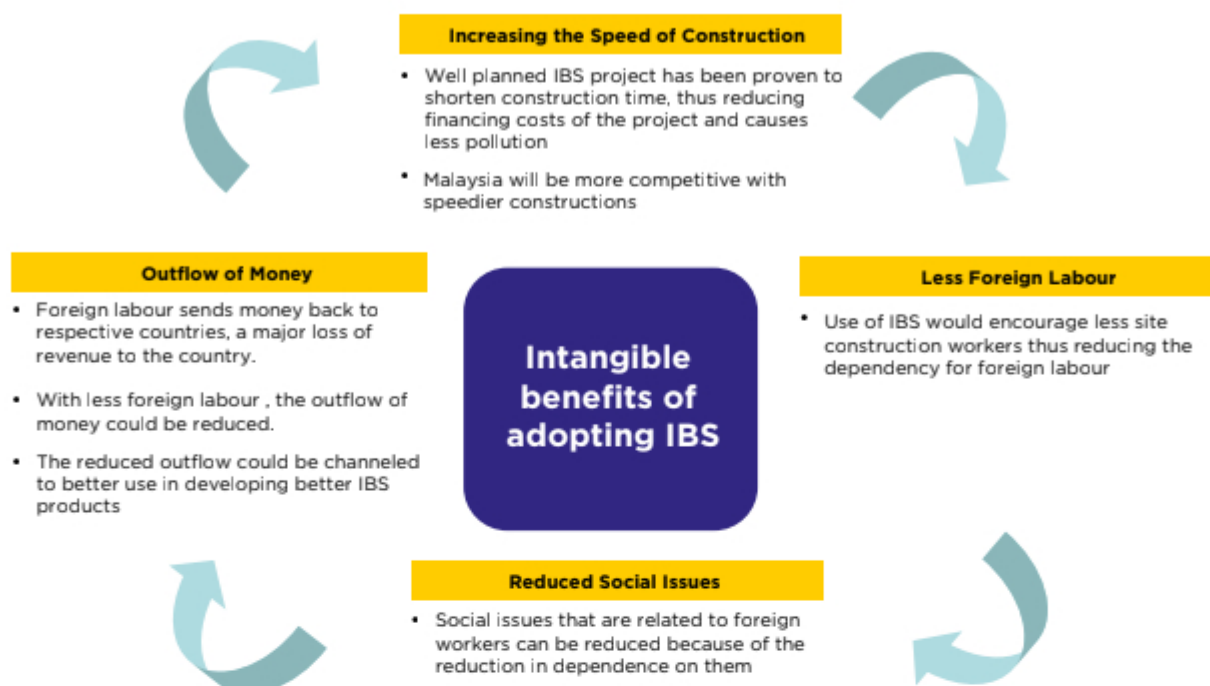
Fewer Site Workers

One of the key benefits of IBS is the reduction of on-site workers. This, compounded with faster completion time is a main draw for policy planners faced with the daunting task of reducing reliance on foreign workers in the country.

9 Source : Construction Industry Master Plan, page 198

10 Industry interviews, 2009

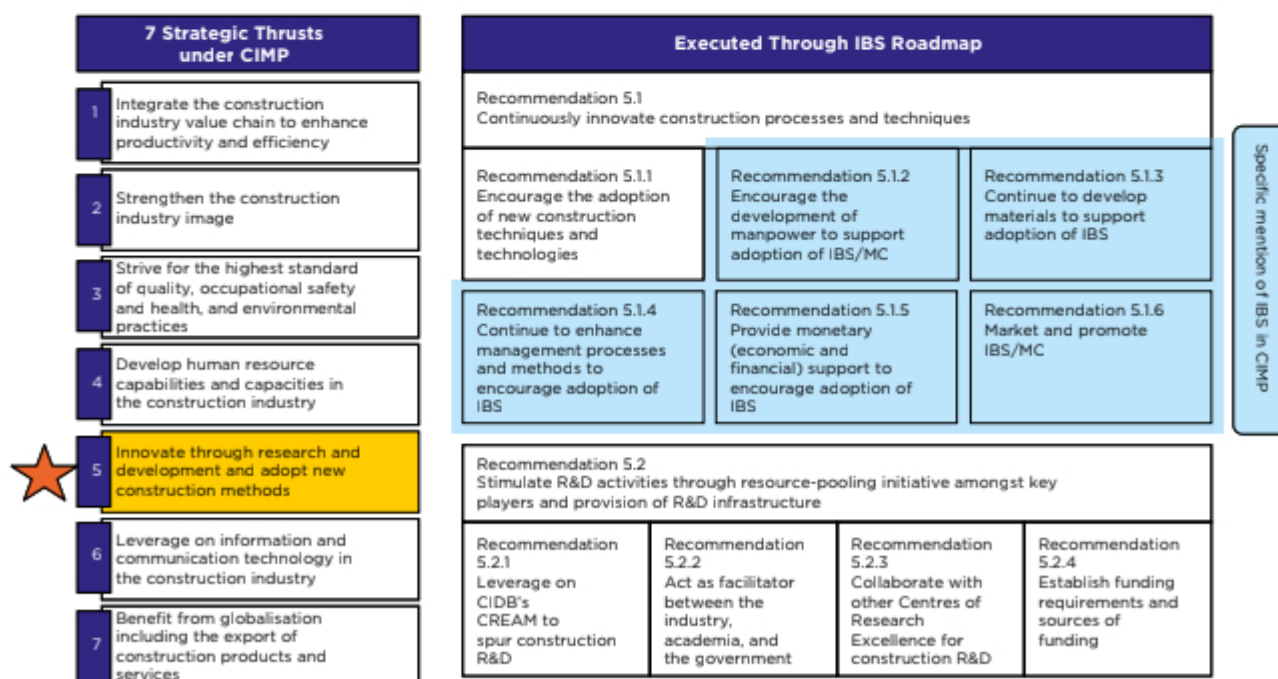
The illustration below identifies the intangible benefits of using IBS



1.2 The Role of IBS in the Construction Industry

The importance of IBS was emphasised in the Construction Industry Master Plan (CIMP) in 2006. Introduction of new construction methods such as IBS was mentioned under Strategic Thrust #5 (please refer to Figure 1.1).

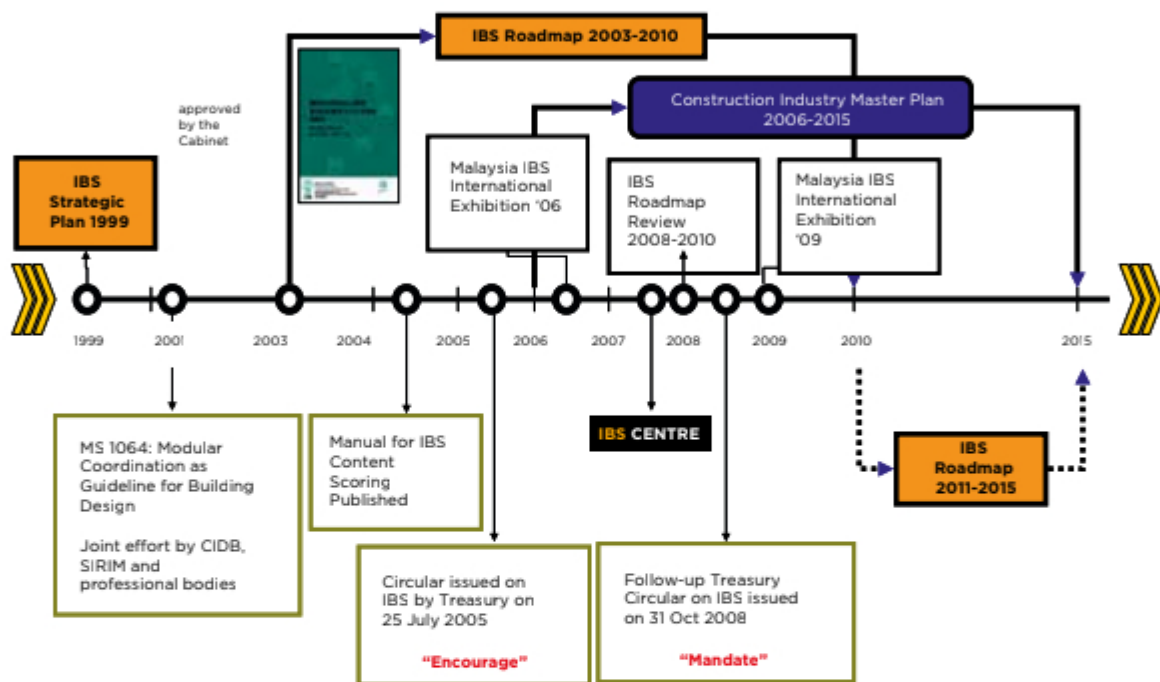
Figure 1.1 IBS Thrust in the Construction Industry Master Plan



Source : Construction Industry Master Plan, 2006-2015

All the seven strategic thrusts in the CIMP are expected to work in a holistic manner to leapfrog the development of the construction industry. According to the CIMP, manpower development, research on materials, monetary (economic and financial), management processes and promotions are required to increase the usage of IBS. However, even after nearly four decades of introduction of IBS, it appears that the usage of IBS in Malaysia is still low compared to that of other developed countries. The prevalence of the current situation cannot be blamed on lack of effort and time spent by the GoM. See Figure 1.2 of past efforts and key milestones achieved.

Figure 1.2 Key Milestones from 1999 to 2010



Within five years of the incorporation of Construction Industry Development Board (CIDB), the GoM launched the IBS Strategic Plan in 1999 to promote the greater usage of IBS in the construction industry.

One early initiative was the introduction of the Modular Coordination Guideline for Building Designs (MS1064) which is essential for the adoption of IBS in the industry. This guideline was a public-private joint effort towards standardisation through modular coordination. However, this guideline was not made compulsory.

An IBS Roadmap was introduced in 2003 with strategic goals to be achieved within seven years. Strategies on manpower, materials/ machines, management, monetary and marketing were identified. The commitment to IBS was re-affirmed when this IBS Roadmap 2003-2010 was endorsed by the Cabinet¹¹ as the blueprint to industrialise the construction sector by 2010.

Subsequently, a Treasury Circular was issued in 2005 to introduce the use of IBS in the public sector. However, this did not gain much traction as the circular only “encouraged” the use of IBS.

To show the serious intention to push the IBS agenda, the GoM took the firm stance to *mandatory* the use of IBS way of construction in all GoM projects above the value of RM10million, through a Treasury Circular in 2008¹².

1.3 The Focus of the IBS Roadmap (2011-2015)

With the public sector now on the IBS track, the next challenge and opportunity is to convince private sector projects owners, being the main engine of growth in the construction industry, to increase usage of IBS. Hence, the goal of the new IBS Roadmap should include the private sector, i.e. to achieve a usage of 50% IBS content by 2015¹³.

The new IBS Roadmap will provide an effective framework for the GoM’s role as a facilitator and the custodian of public interests. The entity to drive the day-to-day implementation must be stronger, more well-resourced and well-governed, to be held accountable to performance-based outcomes.

The IBS journey to increase private sector participation will be confronted with many challenges and hard decisions must be taken. It is a journey that will require:

1. The steadfast commitment by the GoM to stay the charted course and push through foundation-building areas;
2. The support of the private sector, through their elected representatives in professional bodies and industry association leaders, to support the required changes;

¹¹ Endorsement was given by the Cabinet on 29th October 2003

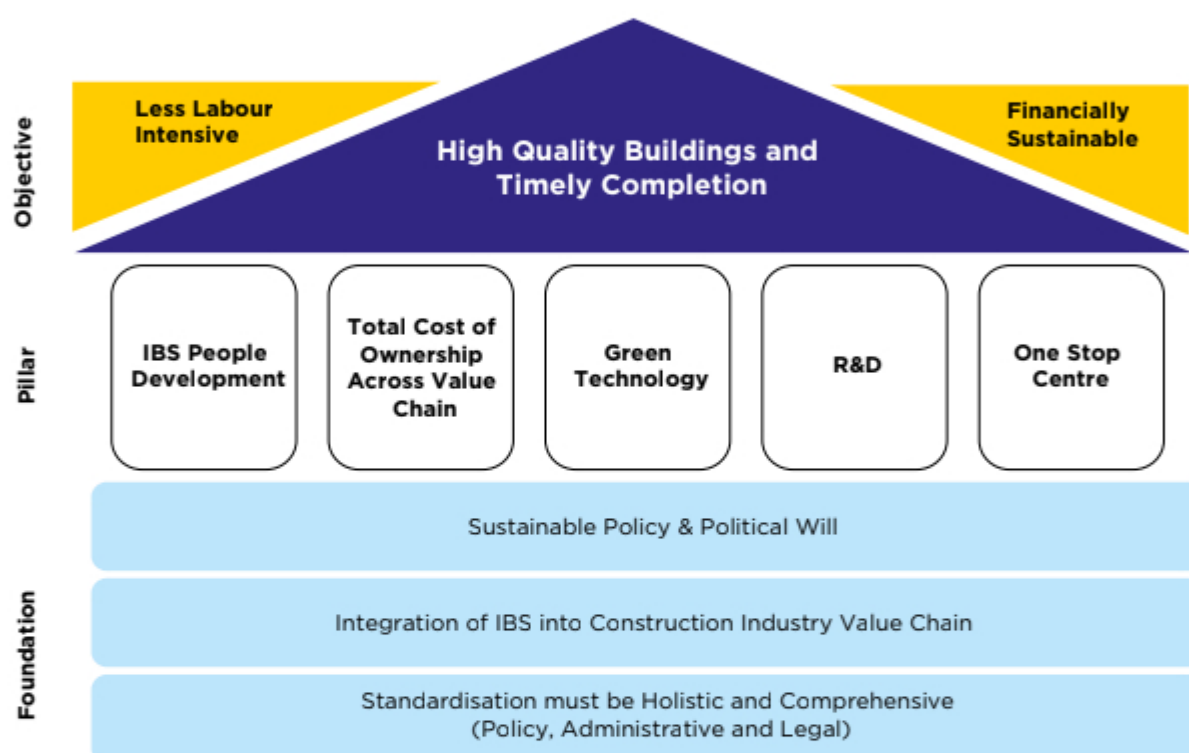
¹² Treasury Circular or Surat Pekeliling Perbendaharaan Bilangan 7/2008 was issued to mandate the usage of IBS in public sector projects above the value of RM10million. This ruling applies with the **EXCEPTION** of : Projects below RM10million, unless specifically identified as an IBS project by JKR even though below RM10million; Projects carried out in far-off places which cannot be easily accessed for IBS purposes; or Renovation and maintenance work of existing buildings and does not involve construction of new buildings

¹³ 50% is the proposed average. Subject to further refinement by types of projects

Political Will and Sustainable Policies

The political leadership is committed and steadfast in its will to decide and follow through with the decision to choose IBS as the preferred method of construction. Malaysia has attempted to promote IBS in the past but adoption continues to be plagued by challenges and resistance from the construction industry. Past efforts have centered around training and publications with little traction given on tough and critical areas such as standardisation and control over the influx of foreign workers. In the new wave, the GoM will focus on “foundation-building areas”.

Figure1.3 The House of IBS



The GoM's commitment to the stakeholders in this Roadmap is encapsulated in this "house". Like all great buildings, ensuring IBS is built on a strong foundation is crucial.

Foundation building activities key to IBS implementation are:

- ***Sustainable policy and political will*** to change from conventional to the IBS way of construction
- ***Integration*** of IBS into the Construction Industry Value Chain (from design, manufacture and build)
- ***Standardisation*** which should be holistic and comprehensive

The Support of the Private Sector

To gain the support of the private sector stakeholders, the new IBS Roadmap will be a public-private-partnership engagement framework to **garner participation from the private sector**. It is envisaged that the private sector, through the creation of a MoW-led IBS Consultative Forum, will provide input at the onset of implementation roll-out for the private sector (i.e. policy-making stage).

Chapter 2

What is the Current Position?



What is the Current Position?

This Chapter examines the current position of IBS. On 29 October 2003, the Cabinet sanctioned the IBS Roadmap 2003-2010 as the Blueprint towards open building and industrialisation of the construction industry. In the last seven years, development efforts, some with collaboration with the private sector, were carried out. However, the adoption of IBS, specifically in the private sector, remains low. Challenges and opportunities have been identified through stakeholder interviews and secondary research to gain a deeper insight into the root cause of the situation.

2.1 Public Sector Mandated to Build Public Sector Projects Using IBS

The GoM, being the single largest buyer of construction works, has taken a firm stance¹⁴ to implement IBS in its Projects in 2008.

At least 291¹⁵ IBS projects were carried out under the 9th Malaysia Plan, constituting a total project value in excess of RM10.0b. RM6.0b worth of IBS projects were carried out directly under the purview of Jabatan Kerja Raya (JKR), while the remaining RM4.0b worth of IBS projects (termed as non-JKR) were outsourced to contractors in the private sector.

The top 5 largest buyers from the public sector (Ministry of Education, Office of the Prime Minister, Ministry of Higher Education, the Ministry of Health and the Ministry of Housing and Local Government) represent an aggregated purchase of RM5.6b or 76% of total IBS project value. The Ministry of Education is the largest IBS construction project buyer, supported by the rapid construction of secondary and primary schools, worth a total of RM2.4b. Refer to Figure 2.1.

14 Treasury Circular or Surat Pekeliling Perbendaharaan Bilangan 7/2008 was issued to mandate the usage of IBS in public sector projects above the value of RM10million.

15 source: Bahagian Pemantauan Kementerian Kerja Raya, Agensi dan Kemahiran (BPAK) April 2010.

Figure 2.1 Public Sector Projects Using IBS Under the 9th Malaysia Plan**Analysis of Public IBS Construction Projects**

	JKR	Non JKR	Total
No. of Projects	115	176	291
Value of Projects (in RM)	5,987,972,657	4,041,748,421	10,029,721,078
Average Size of Projects (in RM)	52,069,327	22,964,480	34,466,395
Share of Total (by number of project)	40%	60%	
Share of Total (by value)	60%	40%	

Breakdown of Public IBS Projects by Ministries (by project value in RM)

Ministries	JKR	Non JKR	Total
1 Kementerian Pelajaran	51,545,185	2,373,558,449	2,425,103,634
2 Jabatan Perdana Menteri	1,552,327,472		1,552,327,472
3 Kementerian Pengajian Tinggi	1,263,816,000	66,717,400	1,330,533,400
4 Kementerian Kesihatan	1,193,760,000		1,193,760,000
5 Kementerian Perumahan & Kerajaan Tempatan		1,154,100,000	1,154,100,000
6 Kementerian Kewangan	481,520,000	20,672,572	502,192,572
7 Kementerian Kerja Raya	482,500,000	4,800,000	487,300,000
8 Kementerian Belia & Sukan	227,000,000	40,000,000	267,000,000
9 Kementerian Pembangunan Wanita Keluarga & Masyarakat	209,500,000		209,500,000
10 Kementerian Pertahanan	60,000,000	129,500,000	189,500,000
11 Kementerian Pertanian & Industri Asas Tani	57,494,000	130,900,000	188,394,000
12 Kementerian Sains Teknologi & Inovasi	128,300,000		128,300,000
13 Kementerian Wilayah Persekutuan & Kesejahteraan Bandar		121,500,000	121,500,000
14 Kementerian Sumber Manusia	116,210,000		116,210,000
15 Kementerian Pelancongan	85,000,000		85,000,000
16 Kementerian Pengangkutan	49,500,000		49,500,000
17 Kementerian Perusahaan Perladangan & Komoditi	21,500,000		21,500,000
18 Kementerian Kemajuan Luar Bandar & Wilayah	8,000,000		8,000,000
Total	5,987,972,657	4,041,748,421	10,029,721,078

Note :

The projects are IBS Projects under Rancangan Malaysia Ke-9. (RMK-9)

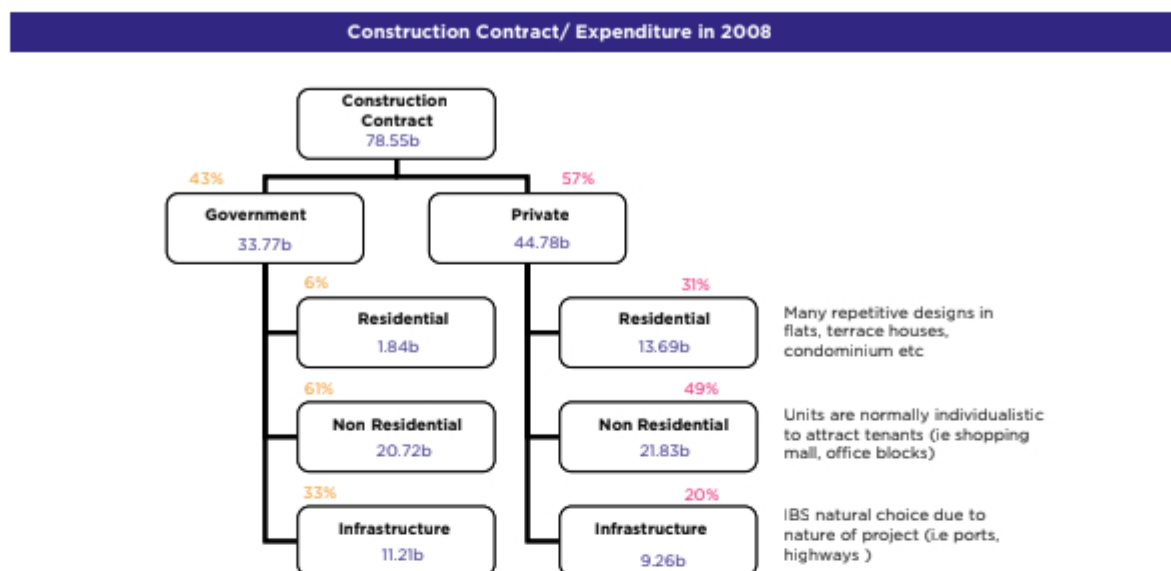
The projects are monitored by the Implementation Coordination Unit (ICU), Prime Minister's Department (JPM)

Data provided by Bahagian Pemantauan Agensi dan Kemahiran (BPAK), Ministry of Works (Apr 2010)

2.2 The Next Wave is to Convince the Private Sector to Embrace IBS

The private sector accounts for 55-60%¹⁶ of the total project value carried out by the entire construction industry. To achieve an overall industrialised construction industry, the buy-in of the private sector is equally important. Residential projects such as flats, condominiums and terrace houses have high IBS potential due to its repetitive nature of production. The private sector built RM13.6b worth of residential projects, compared to only RM1.8b by the public sector. If the private sector can be convinced to adopt IBS, the resulting outcomes will be manifold.

¹⁶ Based on average yearly project value from 2005 - 2008 by CIDB

Figure 2.2 The Share of Private Sector Projects**Notes and Assumptions:**

1. Source of information from CIDB, June 2009
2. The above scenario is based on construction contract value for the year 2008
3. Residential includes quarters, terrace houses, bungalows, flat, condominiums, dormitory etc
4. Non residential includes shops, office, business complex, factories, warehouse, factories, hotels and police stations etc
5. Infrastructure such as tunnels, bridges, pier, jetties and highways are using many IBS components due to nature of project

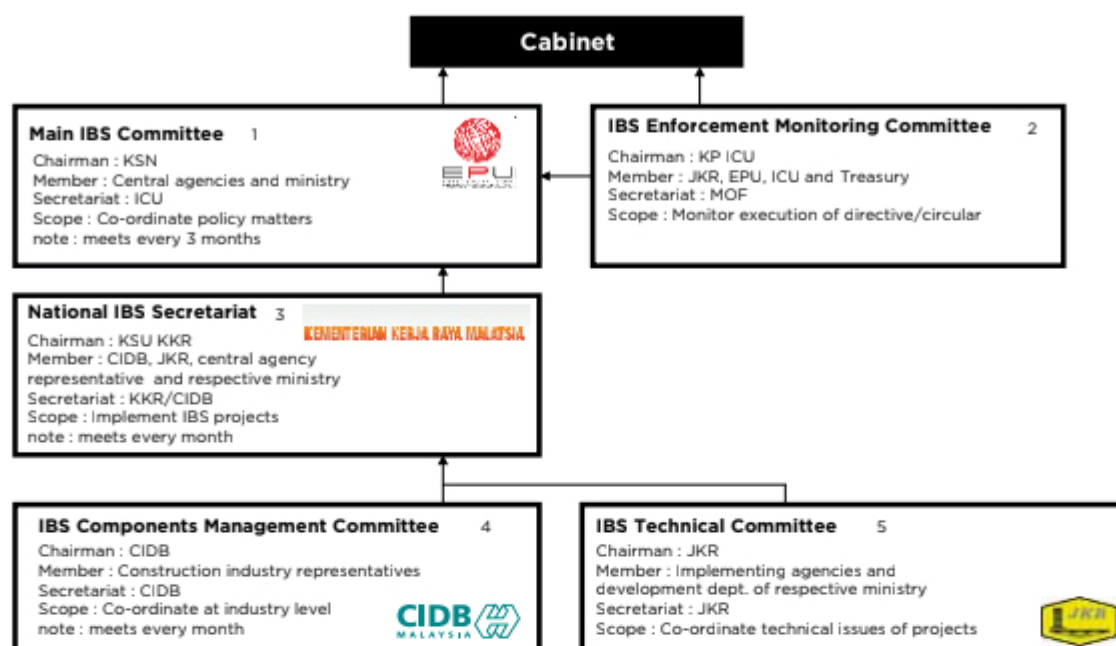
2.3 Various Committees Form the Existing Supervisory Framework for Public Sector Projects

There are various public steering committees created to ensure IBS is enforced in GoM projects. The working level consists of two main committees:

- The IBS Component Management Committee is chaired by CIDB and consists of representatives from the industry; and
- The IBS Technical Committee chaired by JKR to coordinate all the technical issues faced during a project.

As seen in Figure 2.3, the two working committees report to the National IBS Secretariat, chaired by the Ketua Setiausaha (KSU) of the Ministry of Works (MoW). The National IBS Secretariat consists of members from CIDB, JKR, central agencies and representatives from respective ministries. This committee would be responsible for the implementation of the IBS projects nationwide, specifically to oversee GoM projects.

Figure 2.3 The Existing Committees Overseeing Implementation of IBS for government projects



The National IBS Secretariat reports to the Main IBS Committee, chaired by the Ketua Setiausaha Negara (KSN) to oversee all implementation policy matters and issues impeding IBS implementation; whilst the IBS Enforcement Monitoring Committee, chaired by Director General of Implementation Coordination Unit (KP of ICU) to monitor the execution of the GoM's circular/directive on IBS.

2.4 Existing Activities to Promote IBS Have Not Addressed the Fundamental Issues

The IBS Roadmap 2003-2010 had identified five key areas that need to be addressed in order to increase usage of IBS:

1. Manpower
2. Materials, Components & Machines
3. Management Process & Methods
4. Monetary – Economic & Financial
5. Marketing & Promotion

Figure 2.4 Activities to Promote Usage of IBS, IBS Roadmap 2003-2010

	Manpower	Materials	Management	Monetary	Marketing	TOTAL
Publications Various publication to educate the industry	1	20	1	1	18	41
Training Training, seminar, conferences etc	14	-	6	-	6	26
Promotions Roadshows, Advertisements	-	-	-	-	22	22
Technical Technical Programmes, Schemes	5	1	5	0	1	12
IT IT related (website, database)	-	-	7	1	-	8
Standards Revision & Review of Standards	-	4	-	-	-	4
						113

Note: Number indicate major programme by CIDB

As presented in Figure 2.4, a large number of activities created awareness through publications. This was followed by training to enhance competencies and promotional activities such as road shows.

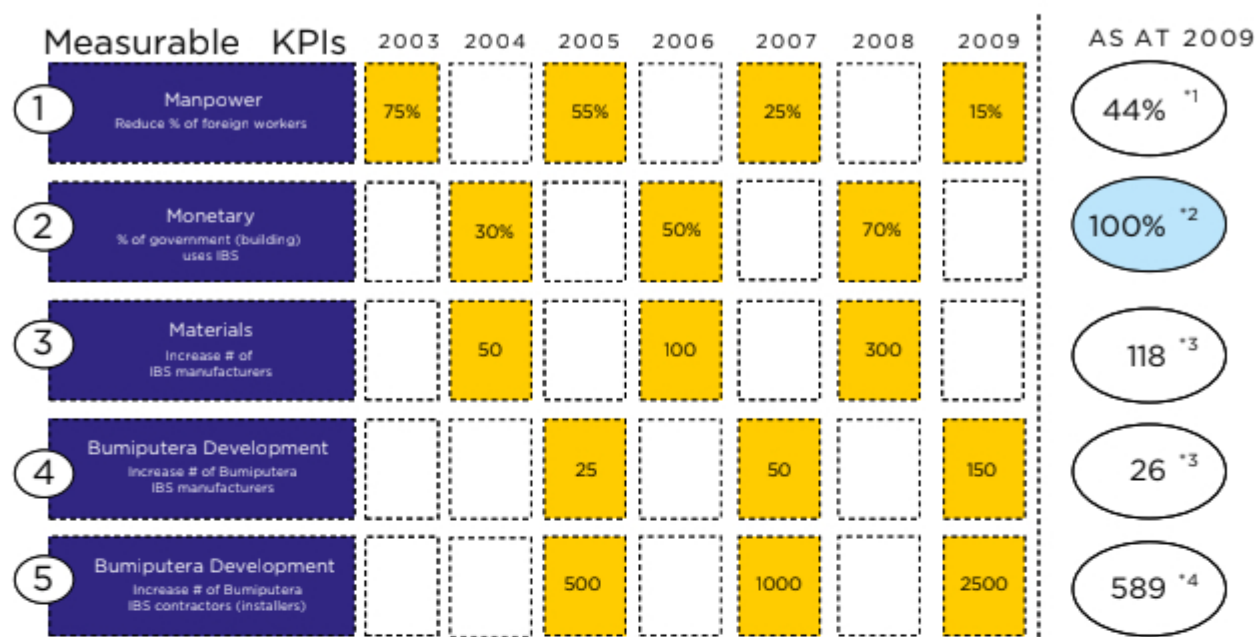
IT-enabled websites and database and standards related activities, although important, were less focused upon.

2.5 Results of Goals Set in IBS Roadmap 2003-2010

A set of quantitative goals were set to achieve the objectives of the existing Roadmap in 2003. Five measurable key performance indicators (KPIs) were identified in the areas of reduction of foreign workers, usage of IBS in GoM buildings, expansion of IBS component manufacturing base and increased Bumiputera participation.

Out of the five quantitative measurable KPIs, one was achieved. The importance of IBS was recognised through the issuance of a Treasury Circular in 2008 that mandated ALL GoM projects to achieve not less than 70% of IBS score.

See Figure 2.5

Figure 2.5 Quantitative Goals in the IBS Roadmap 2003-2010

Source: CIDB

Note 1: Local workers statistics based on construction workers registered with CIDB. Foreign workforce based on Department of Immigration statistics

Note 2: Based on directive in Circular 7/2008 that dictates compulsory 100% IBS usage on identified projects with certain exclusion. % of GoM buildings are by count, and not by value in RM. CIDB may consider capturing value in RM in future KPIs.

Note 3 The IBS Status Manufacturers are based on IBS Status Manufacturers Certification Program registered under CIDB

Note 4: The above is based on number of contractors who have attended IBS skills training in CIDB only

2.5.1 Reliance on Foreign Manpower Remains High

Currently, a high percentage of foreign workers are in the construction industry. In 2008, there were 306,873 registered foreign workers, which made up 44% of the total workers. See Figure 2.6

Figure 2.6 Composition of Workers

Construction Industry Workers	2003	2004	2005	2006	2007	2008
Local Workers	224,877	272,053	309,528	350,831	377,243	393,040
Foreign Workers	231,184	265,925	281,780	267,809	266,742	306,873
TOTAL	456,061	537,978	591,308	618,640	643,965	699,913
% of Foreign Workers	51%	49%	48%	43%	41%	44%

Source: Local workers statistics based on construction workers registered with CIDB. For foreign workers, based on Department of Immigration statistics. NOTE: Does not include illegal workers' statistics

The GoM had intended to steer the industry from labour intensive to a more productive and industrialised method of construction with the usage of IBS. The target set was to achieve a reduction of foreign workers from 75% (2003) to 15% (by 2010).

Although the percentage of foreign workers has decreased over the years, the quantum has not reached the desired level. The reliance on foreign labour continues to be around 44% (2008) of total workers. Nevertheless, this statistic does not include illegal foreign workers.

The major reason for this is the availability of a large pool of under-priced and easily-trained foreign workers in the market. Malaysian employers do not pay for skills, relying instead on tried and tested means such as a readily available pool of unskilled foreign workers and under-priced resources to generate profits. Immigration policies favour low-skilled and cheap labour. Easy access has led to over-reliance on this type of foreign labour, providing employers no incentive to move up the value chain. It has also largely contributed to a dampening effect on wages¹⁷. The unattractive wages further impedes local Malaysians to work in the construction industry and fuels the continuous reliance on foreign labour.

The labour issue is not specific to the construction industry alone. According to the National Economic Model (NEM), the share of skilled labour has declined across industries. In many instances, employers do not pay for skills, relying instead on a readily available pool of unskilled and under-priced foreign workers (made possible by government policies) to generate profits from production of low value-added products and services.

In other countries, minimal Government intervention is required to steer the private sector to adopt IBS. The high cost of labour would typically drive the industry to opt for more productive and less labour intensive methods of construction such as IBS.

In the long term, a similar scenario for Malaysia is also likely, given that foreign workers cannot remain perpetually low and under-priced. As their skills and productivity increases, their wages would also reflect this. Hence, the industry should be prepared for the imminent increase in labour cost.

17 National Economic Model (NEM), NEAC April 2010

2.5.2 Existing IBS Manufacturer Base Not Operating at Optimal Level

A strong manufacturer base is required to support the direction of the industry in embracing IBS. Currently, there are 118 registered IBS manufacturers in the country: 26 are Bumiputera-owned, and it is worthy to note that one of the largest Type 1 pre-cast concrete manufacturers is owned by a government-linked company¹⁸. See Figure 2.7

Figure 2.7 IBS Manufacturers, 2009

IBS Groups	Bumiputera Owned	Overall Total
Type 1 Pre-cast Concrete Framing, Panel and Box Systems	7	36
Type 2 Steel Formwork Systems	3	16
Type 3 Steel Framing Systems	1	29
Type 4 Prefabricated Timber Framing Systems	2	16
Type 5 Block Work Systems	2	10
Others (On-site)	11	11
Total	26	118

Source: CIDB

Note: Based on registered IBS manufacturers as of November 2009

It is perceived that most manufacturers are single plant operators concentrated in selected states only, propagating its own proprietary system, not operating at full capacity and having difficulty meeting the demands of contractors.

These challenges faced can be traced to its root cause of lack of standardisation in the industry. It is envisaged that the GoM's role must be to facilitate standardisation.

2.5.3 Bumiputera Participation Did Not Meet Targeted Level

The data on Bumiputera IBS contractor was not readily available. A close proxy for this data would be the number of personnel who have been trained by CIDB for practical application of IBS.

To-date, 598 contractors have attended this practical IBS training, out of which 589 are Bumiputera contractors. However, this proxy has its limitations as the individual participants may not be active contractors.

In summary, the Bumiputera participation is still below target.

¹⁸ Precast Products Sdn Bhd is a 70%-owned subsidiary of KUB Malaysia Berhad

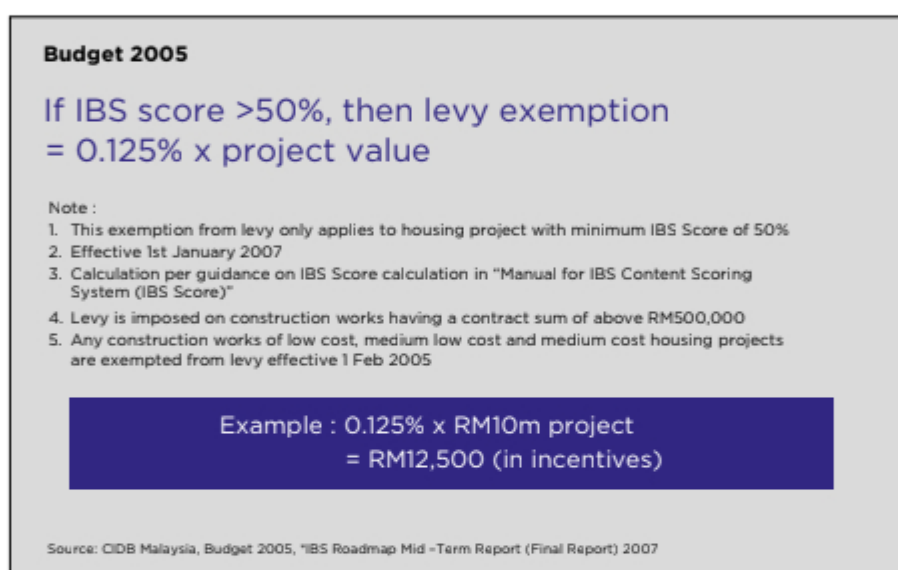
2.6 Key Challenges Faced by Stakeholders – A Value Chain Perspective

Property Developers/Contractors/ Builders/Owners

Currently it is reported in the CIMP that IBS would cost an additional 10%¹⁹ more than conventional methods, whilst the levy exemption given as an incentive is only 0.125%²⁰. E.g. For a project size of RM10m, the incentive is RM12,500.

This incentive cannot cover the additional cost incurred by the developers. In a competitive industry where margin is of most importance, the justification to switch to IBS is thus still weak. See Figure 2.8

Figure 2.8 IBS Incentives for the Private Sector



Another barrier may be that through IBS, tenders would be more "transparent". In submitting a bid for a project, contractors are required to itemise each cost component. As IBS components are sourced from third party suppliers and the cost of each component can be easily available, there is little room for margin play, limiting the cross-subsidising²¹ practice by some contractors.

Designers/Architects

IBS is not the preferred choice among designers²² because IBS is being perceived as limiting the creativity in design and architectural expression. There is a lack of IBS design knowledge among designers in the industry at the moment. As most of the IBS products are based on proprietary systems due to lack of standardisation, the designer is required to be familiar with the many different systems in the market for different projects.

¹⁹ Construction Industry Master Plan, Page 54

²⁰ This exemption from levy only applies to housing project with minimum IBS Score of 50%, effective 1 Jan 2007

²¹ Cross-subsidising practice occurs when the contractor has to adhere to the recommended ceiling price of certain cost components, but in reality, a higher amount was paid. This amount is then "recovered" under other components.

²² Stakeholder Interviews

IBS Manufacturing Base

For the manufacturers, most production facilities are not optimised due to lack of economies of scale. The manufacturers are faced with requests for different sized components from different projects which require investments in new moulds. At the moment, the general consensus shows that the existing manufacturing base is inadequate to support the construction industry. The small number of manufacturers, lack of innovative designs and lack of support personnel are some major issues to be addressed²³. The mandate taken by the GoM to use IBS was a big push for the IBS industry. This provided some impetus for existing manufacturers to expand their facility given the inevitable increase in demand for IBS products.

The next gap closing measure should thus be to streamline and standardise common IBS components across projects in order to achieve economies of scale for both buyers and manufacturers.

Construction Site

Currently there is a shortage of skilled on-site specialists for assembly and erection of components and experienced IBS project managers who can plan and coordinate with the IBS manufacturers.

The perception that IBS is a simplified way of construction²⁴ needs to be corrected. Firstly, 'construction' is now being carried out in a controlled environment in a facility which may be remote from the project site. This requires very careful planning as the components are made off-site and the suppliers have to produce accurately to the customer's specifications.

Some of the larger IBS manufacturers are finding it very difficult to recruit people with IBS experience who can understand the construction process and be able to translate technical drawings to produce the required IBS components.

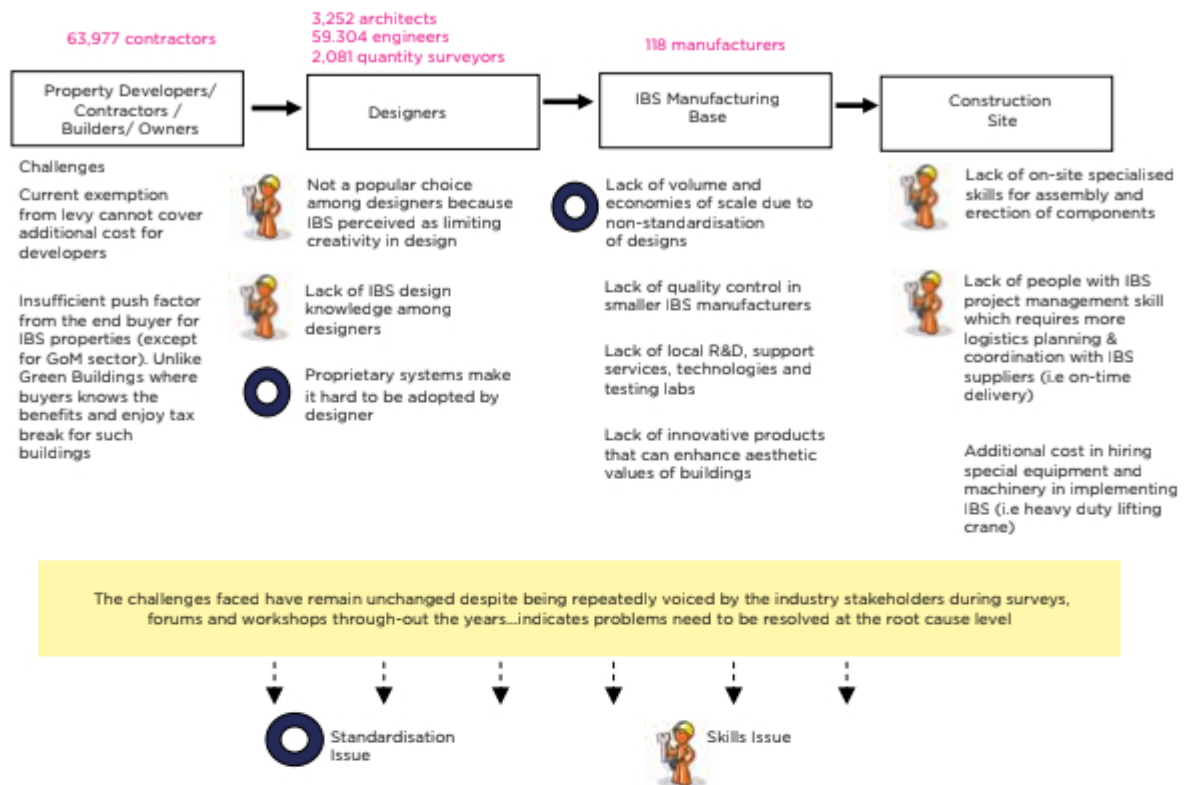
In addition, the installation process on-site requires skilled installers. There are a few options to train a skilled IBS installer: One way is through apprenticeship and working with contractors who are carrying out IBS projects. IBS courses carried out in training institutions such as Akademi Binaan Malaysia and Pusat IBS are very short-termed (approximately 3-5 days for each module). The effectiveness of such courses may be questionable and need to be re-examined in the new context of creating IBS para-professionals to support the industry.

Additional cost in hiring special equipment and machinery in implementing IBS (i.e. heavy duty lifting crane) would also impede the adoption of IBS.

Refer to Figure 2.9 for a summary of the challenges faced in the adoption of IBS across the value chain of the construction industry.

²³ Industry interviews, 2009

²⁴ As described in the Construction Industry Master Plan, page 198

Figure 2.9 Challenges Along the Construction Industry Value Chain

2.7 The Lack of Standardisation

Standardisation or the lack of it has been repeatedly cited as the root cause of the poor acceptance of IBS. Lack of standardisation causes inefficiency and production would be at sub-optimal levels. This in turn causes the increase in prices of IBS products which make it unattractive to the property developers to choose IBS. The following section sets out to outline the importance of achieving standardisation in this Roadmap.

2.7.1 The Objective of Standardisation

The common purposes for achieving standardisation are as follows:

- Provide common design criteria and methods to enable common understanding between owners, designers, contractors and manufacturers of IBS components
- Improve the productivity and competitiveness of all stakeholders along the construction life-cycle, i.e. lowering the production cost through economies of scale
- Facilitate technical communication, i.e. for quality, safety and research purposes
- Ensure that products are inter-changeable via an open building system concept

Currently, the following industry guidelines for standardisation are in place but compliance is voluntary:

- Malaysian Standard (MS 1064),
- Construction Industry Standards
- CIDB : Sizing Guide for Precast Concrete Building Components for Residential Buildings

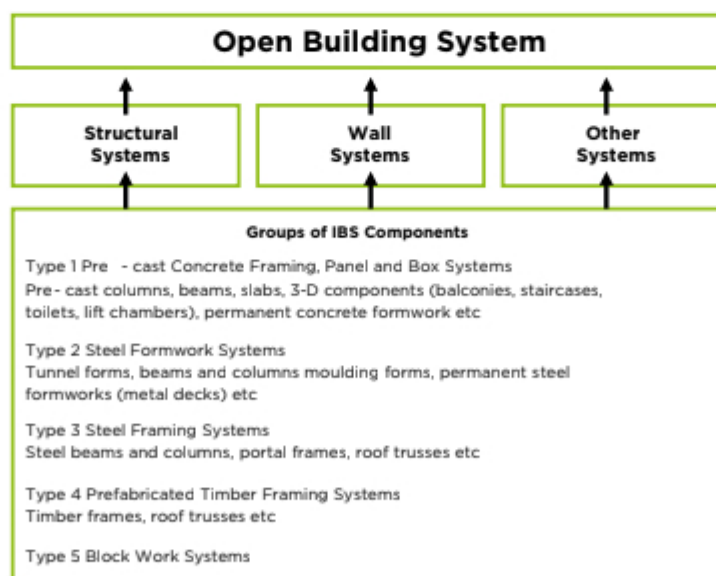
Figure 2.10 Available Standards

Industry Standards and Guidelines for IBS Products	Designed with Input from Industry	Enforcement	Types of IBS Products				
			Type 1 Pre Cast	Type 2 Steel Formwork	Type 3 Steel Framing	Type 4 Timber Framing	Type 5 Blockwork
Malaysian Standard (MS 1064), 2001 Part 3: Coordinating sizes and preferred sizes for stairs and stair opening Part 8: Co-ordinating sizes and preferred sizes for masonry bricks and blocks Part 10: Coordinating sizes and preferred sizes for reinforced concrete components	✓ ✓ ✓	Voluntary	✓ ✓				✓
Construction Industry Standards CIS 5 (2004) : QA Scheme for Prefabricated Timber Truss Systems CIS 6(2006) : QA Scheme for Treatment of Timber for Roof Truss Systems CIS 8 (2007) : Design Guide on Precast Hollow Core Slab	✓ ✓ ✓	Voluntary	 ✓			✓ ✓	
CIDB : Sizing Guide for Precast Concrete Building Components for Residential Buildings	✓	Voluntary	✓				

2.7.2 Definition and Various Forms of Standardisation

The usage of IBS is seen as a step to allow a more flexible and open building system to take shape. See Figure 2.11.

Figure 2.11 Towards an Open Building System

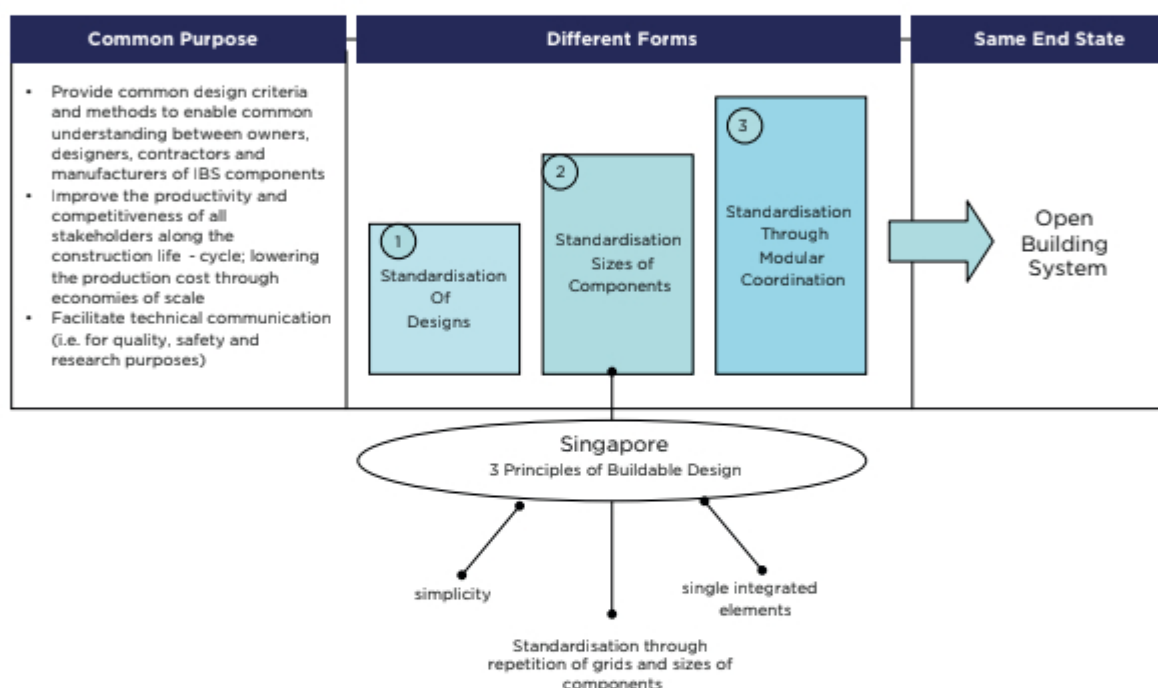


Under the open building system concept, a building is made up of a series of systems, sub-systems and groups of input components. A crucial objective of moving towards an open building system is the inter-changeability factor.

An open system ensures that components or sub-systems are interchangeable and easily replaceable. Studies have shown that IBS can contribute to the inter-changeability factor in each of the systems (i.e. structural systems, wall systems and other systems).

Although the purposes and end-state (i.e. the achievement of an open building system) for standardisation may be commonly acceptable, people may have differing views on the type of standardisation that should take place. See Figure 2.12.

Figure 2.12 Different Forms of Standardisation



The various perspectives on how standardisation should take place are as follows:

- Standardisation of designs - to have model designs for reference for common repetitive projects (i.e. schools, teacher's quarters, hospitals etc)
- Standardisation of sizes of commonly used components - e.g. the industry uses the measurement of 1.2m in width for hollow core slabs but the length can be tailored to respective requirements
- Standardisation through modular coordination (MC)

CIDB has taken the view that standardisation of sizes is a precursor to modular coordination.

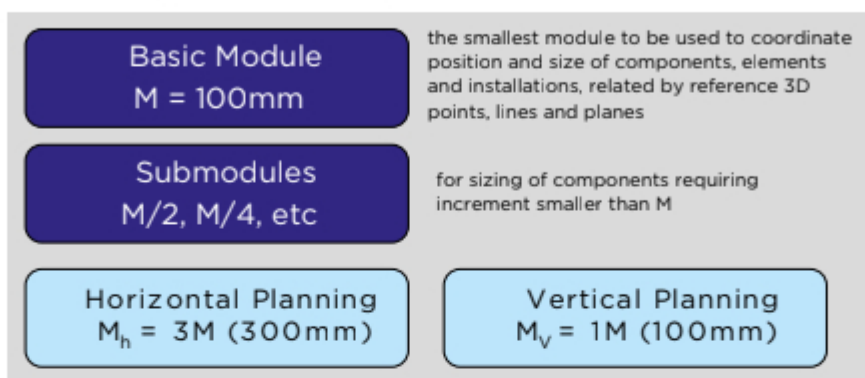
2.7.3 Modular Coordination

Modular Coordination compliments IBS by virtue of its ability to discipline the dimensional and spatial coordination of buildings and their components, thus allowing a more flexible and open industrial system to take shape.

Modular coordination is essentially based on the use of modules (basic module and multi-modules) and a reference system to define coordinating spaces and zones for building elements and for the components which form them. There

are standard rules to abide by - rules for locating building elements within the reference system; rules for sizing building components in order to determine their work sizes; rules for defining preferred sizes for building components and coordinating dimensions for buildings. See Figure 2.13.

Figure 2.13 Concept of Modular Coordination



Source: MS1064

Modular coordination in buildings is not a new concept; It is well documented in the Malaysian Standard MS 1064: Part 1 -10: 2001. It was recommended in the IBS Roadmap (2003-2010) that modular coordination be inserted as part of the uniform building by-laws (UBBL) by the Ministry of Housing and Local Government (MHLG). However, to-date, this has yet to be carried out.

Figure 2.14 provides a chronology of events and the decision to legislate modular coordination through the UBBL. See Figure 2.14

Figure 2.14 Chronology of Decision on Modular Co-ordination

	Through LEGISLATION	Through ADMINISTRATION
23 September 1998 — MoU between MHLG & CIDB signed	●	
31 May 2000 — Received memo from MHLG suggesting amendments to the draft UBBL	●	
19 June 2003 — Letter from legal advisors to Attorney General 's Chambers suggesting the inclusion of Modular Coordination Standards	●	
05 September 2003 — Memo from MAHSURI stating the support for Modular Coordination	●	
16 September 2003 — Memo from LA to MAHSURI advising more thorough research given into legislating Modular Coordination		●
17 September 2003 — Received memo TKPII/JKT agreeing with CIDB 's suggestion to the proposed amendments	●	
2003 — Decision to incorporate Modular Coordination through UBBL by 2004. Published as action item by MHLG in IBS Roadmap 2003 - 2010	▲	
17 October 2005 — Letter from MHLG suggesting MS1064 to be incorporated administratively and not legislatively		●
16 January 2006 — Letter from CIDB to MHLG to follow up on legislating MS1064 through UBBL	●	
9 Feb 2006 — Letter from MHLG to review the draft proposed amendments to UBBL 1984		●
2010 — Request from MHLG to drop action item of incorporating Modular Coordination through UBBL from new IBS Roadmap		●

Legend:

▲ Key milestone ● event

One major reason for the delay in mandating modular coordination is the perceived fear of confusion and resistance from the industry²⁵. This is because modular coordination would require a change from the current imperial system of measurement to metrication.

For example, a housing developer is used to marketing double story link houses at a common size of 22"×75". With modular coordination, this size measurement would have to be stated in meters. The creativity of architects may also be limited as they have to conform to specific modular increment units when designing the sizes of rooms.

Nevertheless, modular coordination will spur the adoption of IBS and make the IBS industry more productive and the construction industry more efficient.

2.8 Conclusion

There is a need to re-align the industry framework to increase private sector participation as the private sector is nascent with huge opportunity with enormous potential for IBS. However, the existing challenges faced must be overcome, preferably with private sector participation from the onset of implementation planning (i.e. policy making stage).

Standardisation needs to be developed and must be applied throughout the entire construction industry value chain. The manufacturing base must also be expanded to support the construction industry.

It is noted that a Standardisation Task Force has been set up by Ministry of Works in March 2010 to resolve the issues highlighted in this study.

²⁵ Industry interview

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Chapter 3

Where Do We Want to Be?



Where Do We Want to Be?

This chapter describes the new IBS Roadmap in terms of policy objectives, mission, focus areas and actions required to move forward. Quality buildings built using quality IBS components will define the success of this Roadmap. The public sector as a first adopter of IBS is expected to address fundamental obstacles such as standardisation. Programmes tailored towards the private sector are the key thrusts of the Roadmap.

3.1 Policy Objectives of Implementing IBS

Policy objectives are the high level intended outcomes of implementing IBS. To remain focused, the policy objectives for the Roadmap have been narrowed down to four i.e. quality, delivery efficiency, competency and productivity and financial sustainability.

A sustainable IBS industry will then contribute to the competitiveness of the construction industry. Refer to Figure 3.1 for the policy objectives.

Figure 3.1 Policy Objectives for IBS



3.1.1 Quality Building

The policy objective to deliver quality building would include embracing a broader mindset of high aesthetics value and good safety levels of building that can be enjoyed for many years in the entire course of ownership of the property. IBS can play an important role in improving the quality of buildings through pre-fabrication in a more controlled environment. Moving some of the building activities from the project site into a quality controlled environment will reduce some of the causes of defects.

3.1.2. Delivery Efficiency

Another policy objective is the capability to complete projects on time and in a shorter duration compared to conventional methods of construction. This will involve improvement efforts in various aspects of the project management and coordination with the various IBS suppliers.

3.1.3. Competency and Productivity

One of the desired outcomes is to have a ready pool of both professionals and workers who use IBS from design, manufacturing, building and maintenance. The challenge is step to up efforts to upgrade the knowledge and skills level of the workforce through education, training and continuous re-training.

The IBS way of building, although can be considered simplified, demands a high level of precision. This would require a critical review of existing training to ensure it can produce rightly skilled people.

3.1.4. Financial Sustainability

Financial sustainability is an essential policy objective. This requires an equitable competitive framework whereby IBS manufacturers should be allowed to earn fair returns for operational efficiency, while being affordable to contractors.

The IBS industry is currently made up of 118 IBS manufacturers²⁶. Demand for IBS products has increased since the Government of Malaysia (GoM) mandated usage of IBS in public sector projects. However, the IBS manufacturing industry is still taking a wait-and-see approach before committing to additional investment. The main concern is the GoM's commitment in using IBS as a preferred method of construction in the long-term.

Therefore, the promise of a sustainable IBS industry is important.

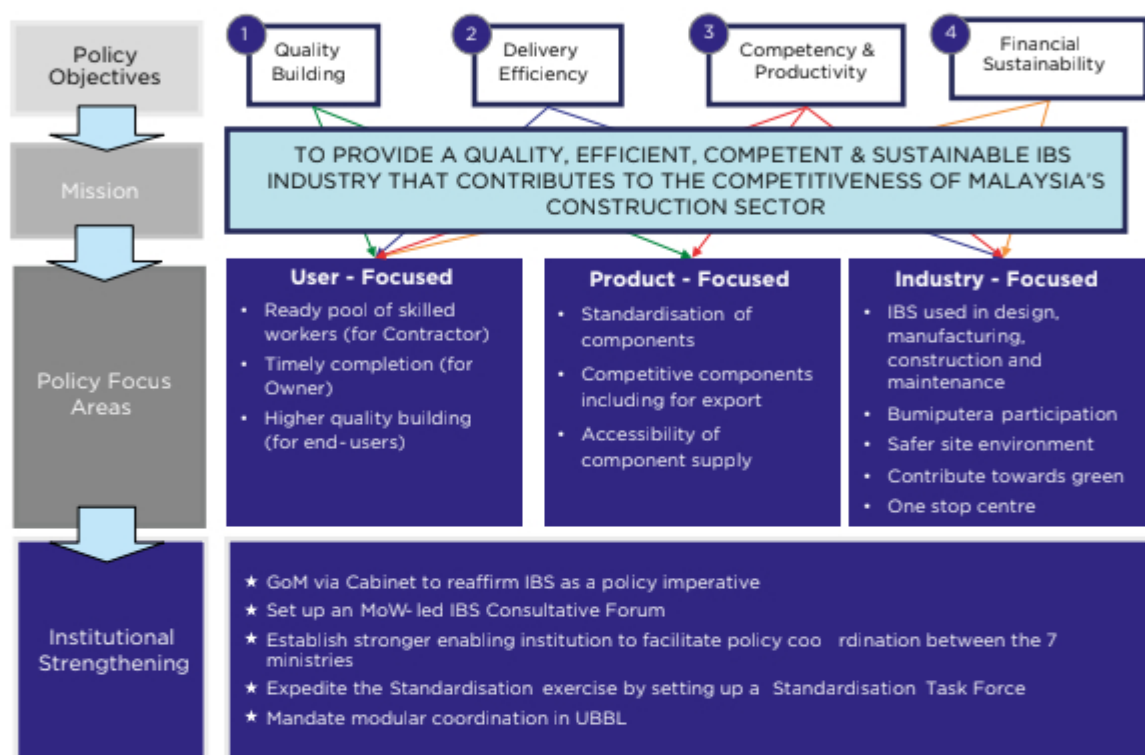
²⁶ Based on number of registered IBS manufacturers as of November 2009

3.2 The IBS Framework – Focusing on the Fundamentals

The policy objectives were then cascaded into four primary areas for change, i.e. targeting the IBS user; product; industry; and institutional strengthening

See Figure 3.2 on policy objectives, mission and policy focus area.

Figure 3.2 Policy Objectives, Mission and Policy Focus Area

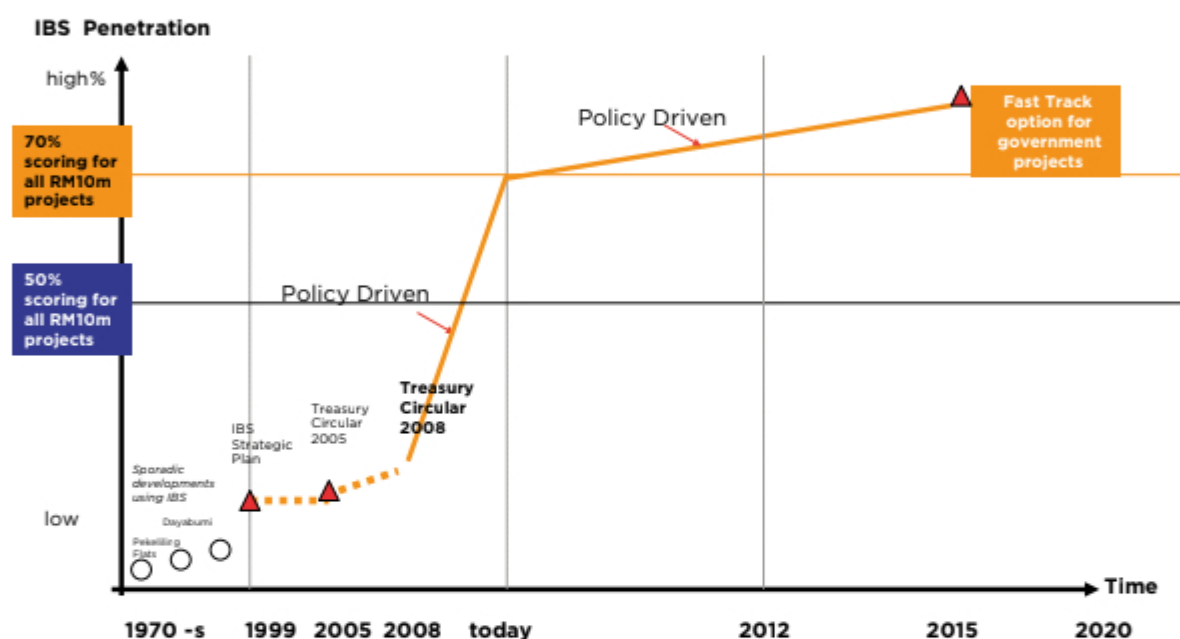


3.3 The Public Sector to Sustain Momentum

The public sector accounts for an average of 44%²⁷ of the total project value carried out by the entire industry.

For the public sector who has already taken the firm stance²⁸ to implement IBS in its Projects, this Roadmap aims to sustain the existing IBS score of 70% through to 2015 for GoM building projects above the value of RM10m

Figure 3.3 IBS Track for the Public Sector



Once the policies have been set, the GoM administrative engine will be strengthened to execute the IBS projects. Institutional arrangement (i.e. collaboration and consistency in policies between the Ministries) must also be enhanced.

The 6 major action steps aimed to maintain the IBS momentum in the public sector are:

- 1 GoM via Cabinet to reaffirm IBS as a policy imperative
- 2 Consolidate existing IBS committees into a MoW-led IBS Consultative Forum
- 3 Establish stronger enabling institution, i.e. an IBS Organisation (IBSO) to facilitate policy coordination between the 7 ministries
- 4 Expedite the Standardisation exercise
- 5 Mandate modular coordination in Uniform Building By-Laws (UBBL)
- 6 Conduct Pilot Program with 3 selected target local councils, e.g. Dewan Bandaraya Kuala Lumpur (DBKL) and regional authorities, e.g. Iskandar Regional Development Authority (IRDA) to identify potential implementation issues and resolve them before a full nationwide roll-out to other local authorities

²⁷ Based on average from 2000 to 2009

²⁸ Based on Treasury Circular 7/2008

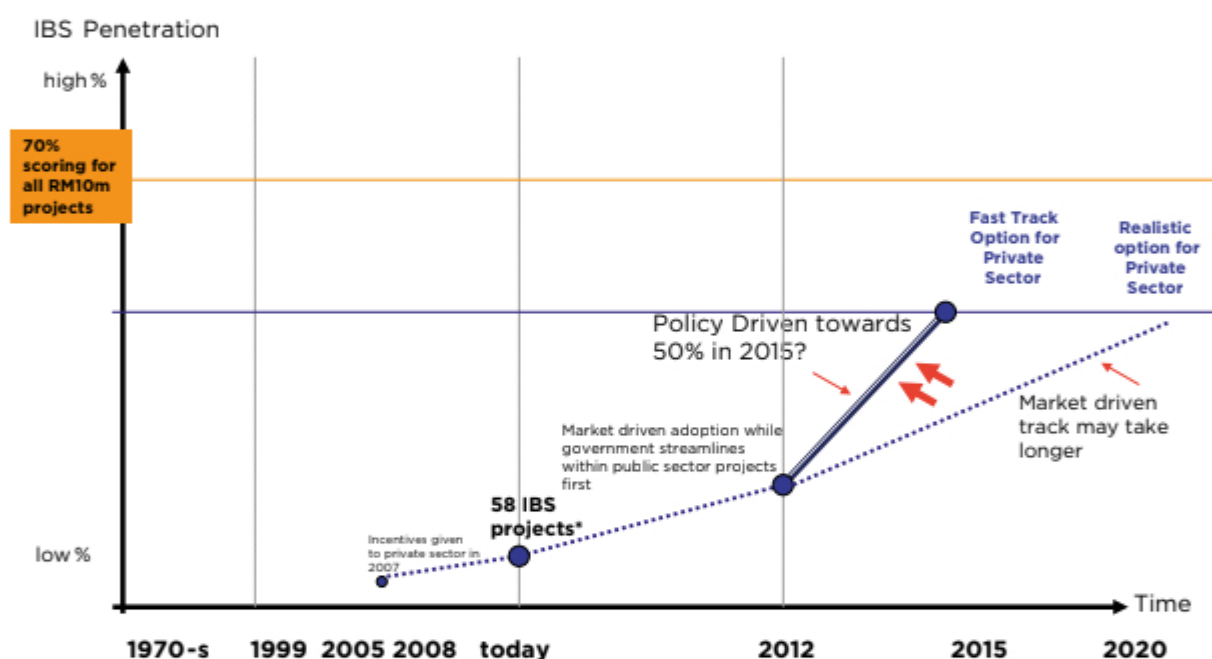
The above are the 6 major action steps that must be carried out first and foremost. Without the above, the other strategies and action steps would not gain much traction.

3.4 The Private Sector to Achieve 50% IBS Content with Incentives

The Roadmap aims to assist the private sector to attain an average IBS score of 50% by 2015

IBS will be carried out in the spirit of a public-private-partnership (PPP).

Figure 3.4 IBS Track for the Private Sector



The target IBS score can be further refined by type of buildings and to increase in a structured manner through the years. See Figure 3.5.

Figure 3.5 IBS Content for the Private Sector

Year	Residential (landed)	Residential (non landed)	Commercial (shopping centers and office buildings)	Industrial (factory and warehouse)	Institutional (schools)
2011	-	-	-	-	-
2012	-	50	50	50	50
2013	45	50	50	50	50
2014	45	55	55	55	55
2015	45	55	55	55	55

This applies to private projects with the EXCEPTION of :

1. Projects below RM10million
2. Projects carried out in far-off places which cannot be easily accessed for IBS purposes; or
3. Renovation and maintenance work of existing buildings and does not involve construction

The above exceptions are similar to the exceptions allowed for public sector projects as specified in Surat Pekeliling Perbendaharaan Bil.7 Tahun 2008

Most importantly, the private sector must take ownership of the target goal. The role of the GoM is to provide assistance and put in place policies that will help the private sector to achieve the IBS target.

The following are some incentives that are non-cash in nature that the GoM will consider to encourage adoption in the private sector. Some of the incentives are based on the incentives given to Green Buildings in the previous budget. See Figure 3.6

Figure 3.6 Incentives to Drive Adoption in Private Sector

Stakeholder	Proposed Incentives	Baseline	2011 - 2015
PROPERTY DEVELOPERS/ OWNERS ★	Higher plot ratio	None	Additional to cover IBS cost
CONTRACTORS AND BUILDERS	Fast Lane approval for IBS projects	120 days for planning permissions and building plan approval under fast lane, 180 days for others	60 days for planning permissions and building plan approval for IBS
HOUSE BUYERS ★	Exemption from stamp duty for Sales and Purchase agreement of IBS certified homes	None	Obtained from 2011 to 2015


★ Given in Budget 2010 for Green Buildings

3.5 Goals and Key Performance Indicators

Key performance indicators (KPIs) are tabled to help define how success is to be measured. The new IBS Roadmap will measure the outcomes based on the adoption level in both the public and private sectors from 2011 through to 2015.

Figure 3.7 Key Performance Indicators (KPI)

OUTCOME KPI		Baseline	2015		
% adoption in GoM Projects (Buildings)		70%	70%		
% adoption in private sector (Buildings)		-	on average 50%; further refined by type of buildings		



Policy Objectives	Measures	Baseline	2011	2013	2015
Quality	QLASSIC Score for IBS projects	70%	70%	75%	80%
	Client (Owner) Satisfaction on IBS Properties	none	tbd	tbd	tbd
Delivery Efficiency	IBS Projects Completed on Time	n.a	80%	90%	95%
Competency and Productivity	IBS Certified Contractors	589	800	1,000	1,500
	Foreign Workers	300,000	285,000	260,000	225,000
Financial Sustainability	Number of ISO Certified IBS Manufacturer	118	-	10% of registered IBS manufacturers	20% of registered IBS manufacturers

The major action steps aimed to help the private sector achieve 50% IBS content by 2015 are:

- ★ Private sector to be represented on a 50:50 basis at policy making stage through participation in the MoW-led IBS Consultative Forum
- ★ Increase incentives to cover additional cost of IBS for the private sector (e.g. increase in plot ratio)
- ★ Recognise and promote National and Regional Champions in IBS
- ★ Execute a major IBS "Signature Project" whereby the private sector can work together to showcase the potential of IBS

CIDB believes that 50% IBS content is a first stake on the ground of where the private sector potential can be in 2015. This can be revised based on output of a more detailed study of the private sector projects and as more data is gathered during the course of the Roadmap.

3.6 Conclusion

This Chapter has outlined what IBS can be in 2015. The four policy objectives of quality, delivery efficiency, competency and productivity and financial sustainability have been identified. The most critical step that will determine the success of this Roadmap would be the unwavering commitment of the GoM to be bold and stay the path of putting the fundamentals solidly in place.

Chapter 4

IBS Roadmap 2011 - 2015



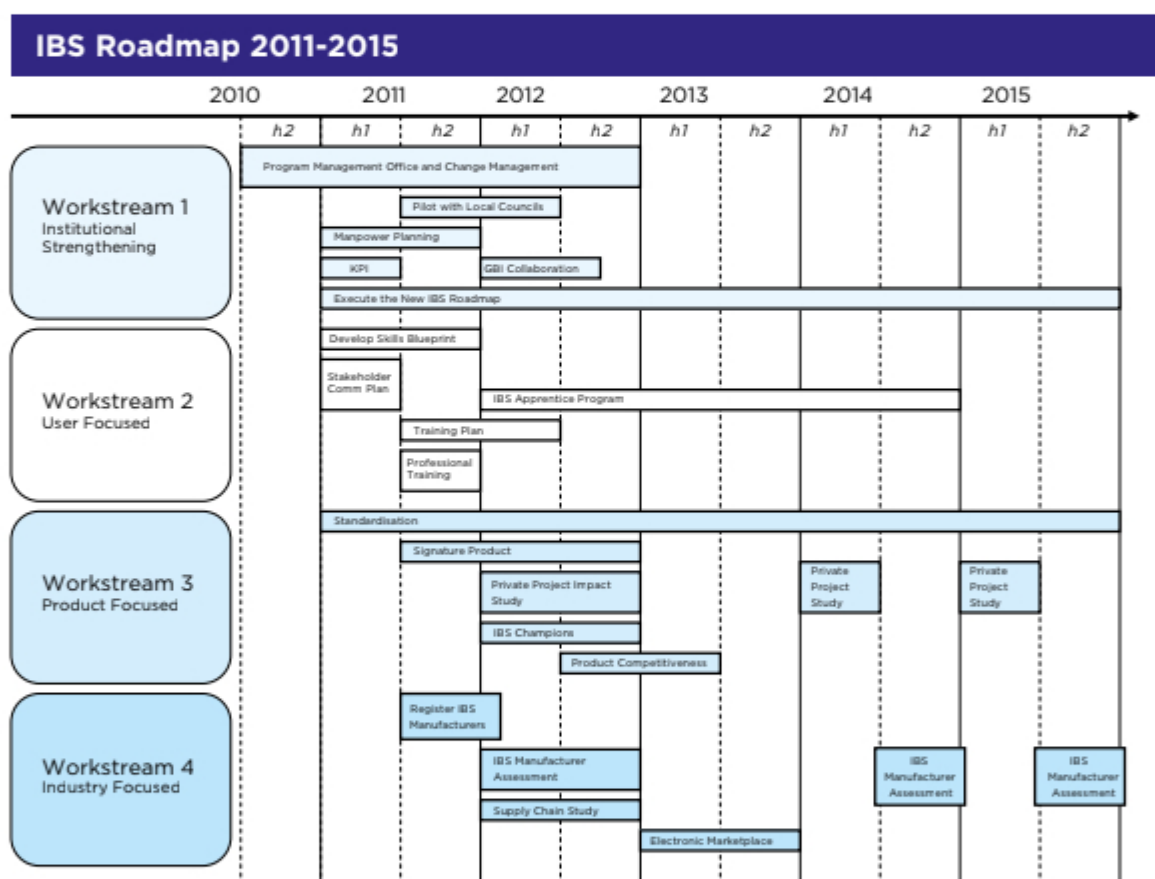
IBS Roadmap 2011-2015

The following describes the Roadmap for IBS for 2011-2015.

4.1 Roadmap To Achieve The Policy Objectives

The Roadmap will be implemented under four workstreams: institutional strengthening, IBS user, product, and industry.

Figure 4.1 IBS Roadmap 2011-2015



Workstream 1: Institutional Strengthening

1. Goal

To ensure the GoM's unwavering commitment towards IBS, once the policies are set, the executing engine must be able to push through the required changes. The decision-making process must be improved. The day-to-day entity needs to be empowered to be more authoritative, better resourced, policy-objective driven and be run as a user-friendly one-stop IBS organisation.

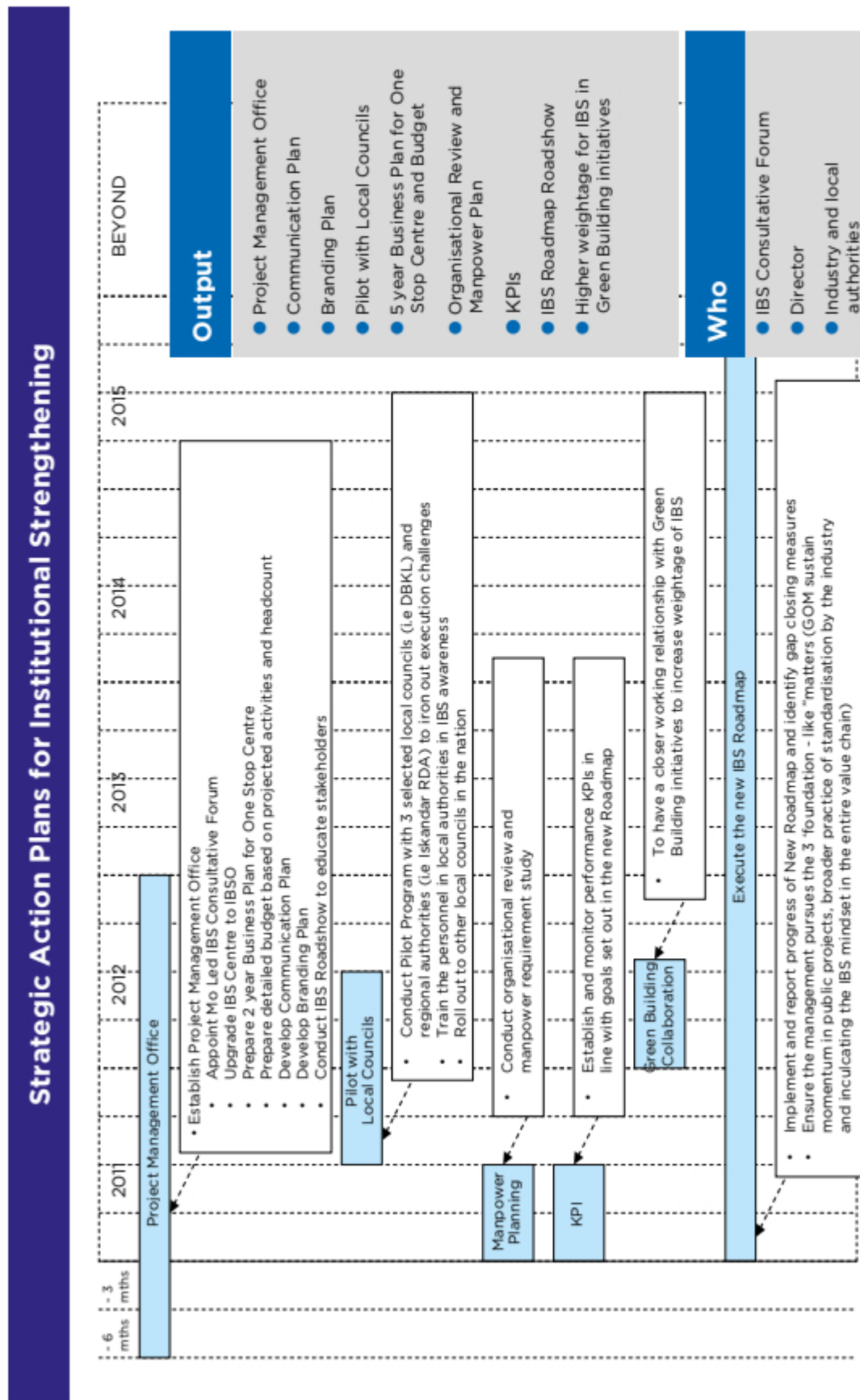
2. Strategies and Action Steps

Strategy	Actions Steps
① Strengthen institutional arrangement	<ul style="list-style-type: none"> i) GoM via Cabinet to reaffirm IBS as a policy imperative ii) Consolidate existing IBS committees into a MoW-led IBS Consultative Forum iii) Establish stronger enabling institution, i.e. an IBS Organisation (IBSO) to facilitate policy coordination between the 7 ministries (this is elaborated in Chapter 5) iv) Expedite the Standardisation exercise v) Mandate modular coordination in Uniform Building By-Laws (UBBL) vi) Conduct Pilot Program with 3 selected target local councils, e.g. DBKL and regional authorities, e.g. IRDA to identify potential implementation issues and resolve them before a full nationwide roll-out to other local authorities
② Improve decision-making process	<ul style="list-style-type: none"> i) Appoint Director for IBSO reporting to the CEO of CIDB for administrative matters and the Board for policy matters
③ Improve service delivery	<ul style="list-style-type: none"> i) Upgrade Pusat IBS to the IBSO, making it an "IBS One Stop Centre" ii) Set-up Customer Feedback Forum iii) Prepare a 5-year Business Plan for the IBSO with a detailed operating budget iv) Set up a Program/ Project Management Office to promote and advocate the strategic initiatives under the new IBS Roadmap, primarily to the stakeholders and later nationwide v) Conduct organisational review of the existing Pusat IBS and manpower requirement study for the IBSO vi) Finalise additional headcount, prepare Scheme of Services and headhunt for Senior Management of IBSO vii) Establish and monitor performance KPIs for performance of IBSO viii) Foster a closer working relationship with Green Building initiatives to increase weightage of IBS ix) Communicate and educate the stakeholders on the new IBS Roadmap x) Implement and report progress of Roadmap and identify gap closing measures

3. Expected Outcome

- 1 The unwavering commitment of the GoM translated into action steps.

Figure 4.2 Action Plan for Institutional Strengthening



Workstream 2: Focusing on User

1. Goal

To achieve the policy objective to achieve competency and productivity in terms of labour force, the industry needs to ensure a ready pool of *both* professionals and workers who are practising IBS and reduce reliance on foreign workers.

2. Current Challenges

- 1 Working conditions and compensation do not attract Malaysian workers to work in the construction industry
- 2 Employers rely heavily on foreign workers who are under-priced and easily trained
- 3 The trained personnel may not eventually work in the construction sector, and for those who do, the skill level may not meet the demand of the industry
- 4 The existing workforce (both professional and workers) in general is not well-versed with IBS. For those with IBS training, often they are well-versed in selected proprietary systems only.

3. Strategies and Action Steps

Strategy	Actions Steps
❶ Up-skill the existing labour force	<ol style="list-style-type: none"> i) Collate next level of granularity of skills for IBS by developing a Skills Blueprint to identify training needs of the private sector, guided by a Skills Council (private sector input). ii) Provide IBS training to the workforce iii) Partner with industry to encourage Continuous Employment Training (CET). Commence training to professionals who can embed innovative usage of IBS into the design of buildings
❷ Attract Malaysians back to the industry	<ol style="list-style-type: none"> i) Increase emphasis on technical and vocational training colleges ii) Examine the employment working terms in the industry iii) Carry out a Pilot IBS Apprentice Programme for a 3-year contract upon graduation
❸ Reduce reliance on foreign labour	<ol style="list-style-type: none"> i) Reduce reliance on foreign labour by propagating a levy system to achieve targets by skilled and unskilled foreign labour in line with industry needs ii) Centralise oversight of foreign labour to enable better planning and monitoring

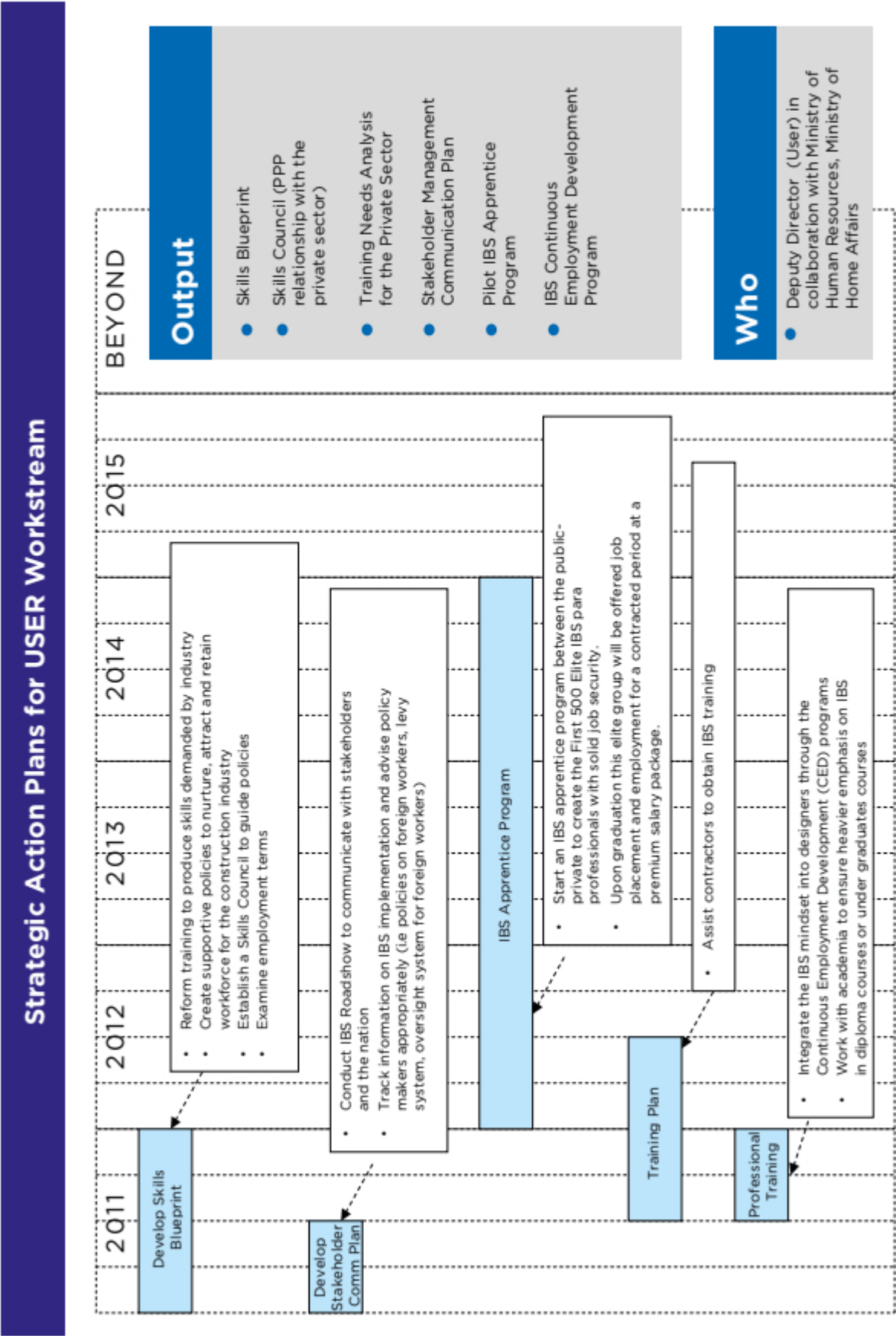
Person In Charge

The Deputy Director (User) will oversee the collaboration with the stakeholders (industry, Ministry of Human Resources and Ministry of Home Affairs)

Expected Outcome

- 1 Improved use of the limited human capital for the industry
- 2 Less workers required on-site
- 3 IBS will be able to increase the per capita contribution of the workforce

Figure 4.3 Action Plan for User-Focused Activities



Workstream 3: Focusing on Product

1. Goal

To achieve the policy objective of achieving quality in the designs, components and buildings, this workstream concentrates on the product itself. An IBS product of quality should be consistent in terms of quality and provide value for money. It is envisaged that with the standardisation in sizes of commonly used IBS components, economies of scale in production can be achieved, which then can be translated into competitive prices to the buyers.

2. Current Challenges

The current higher cost of construction using the IBS method is a major barrier to adoption. Due to a lack of commonly accepted sizes of products, IBS manufacturers are not producing at a cost optimal level. Hence, standardisation is the first step towards affordable IBS products.

3. Strategies and Action Steps

Strategy	Actions Steps
❶ Increase the availability of quality controlled and standardised IBS product	<ul style="list-style-type: none"> i) Increase availability of quality controlled and standardised IBS products through the Standardisation exercise ii) Promote ISO certification for IBS manufacturers
❷ Convince the property developers that IBS is financially justifiable	<ul style="list-style-type: none"> i) Assess impact of IBS in private sector projects to convince the property developers that IBS is financially justifiable (i.e. quality, price, value) ii) Mitigate the additional cost of using IBS method of construction with non-cash incentives (e.g. increased plot ratio) iii) Recognise and promote National and Regional Champions in IBS
❸ Change the perception, IBS is more than just concrete based	<ul style="list-style-type: none"> i) Execute an "IBS Signature Project" that will allow participation from designers, manufacturers and contractors to work cohesively to deliver a showcase ii) Change the perception that IBS means unattractive modular buildings (often concrete-based) by promoting other non concrete-based IBS products

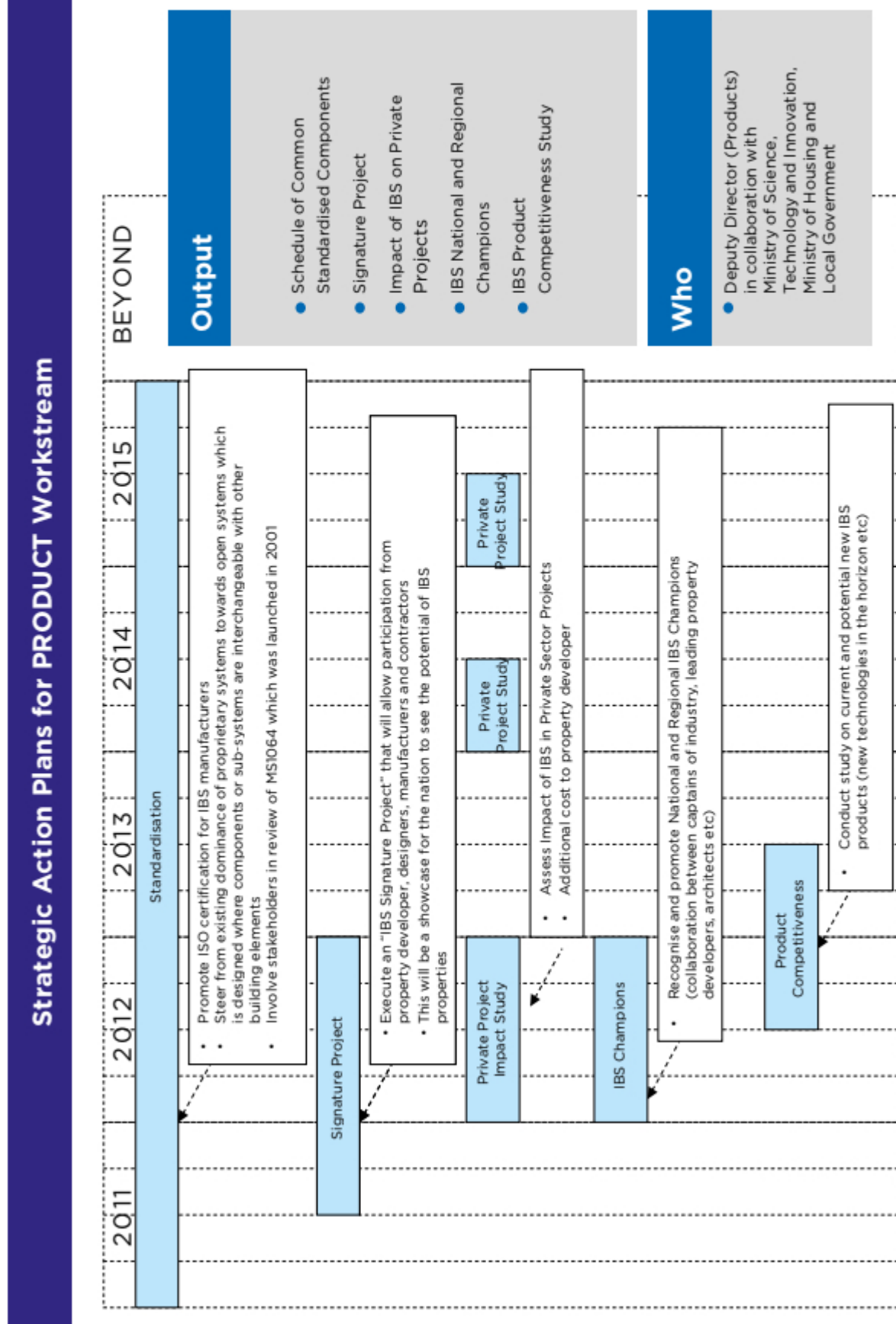
Person In Charge

The Deputy Director (Products) will oversee the collaboration with the stakeholders (industry, Ministry of Science, Technology and Innovation, Ministry of Housing and Local Government).

Expected Outcome

- 1 The IBS users will find IBS products more affordable. A scenario in the future could be where the contractors can walk into a trading house for IBS products and be able to purchase commonly used IBS products off the shelves.
- 2 Specific training for specific proprietary systems will not be required as workers can now be easily-trained in one system.

Figure 4.4 Action Plan for Product Focused Activities



Workstream 4: Focusing on Industry

1. Goal

To achieve the policy objective of financial sustainability, the IBS component manufacturing industry needs to be energised, i.e. to ensure it remains innovative and supportive, with accreditation standards for the products and trained workers. The workstream will also focus on on-time delivery of projects.

2. Current Challenges

- 1 The current IBS component manufacturing industry will be unable to cater for future growth of IBS usage in the construction industry.
- 2 Although some IBS manufacturing companies are exporting their supply, majority are single plant manufacturers faced with financial challenges
- 3 The inability to attract and retain skilled IBS designers and workers for the manufacturing industry.

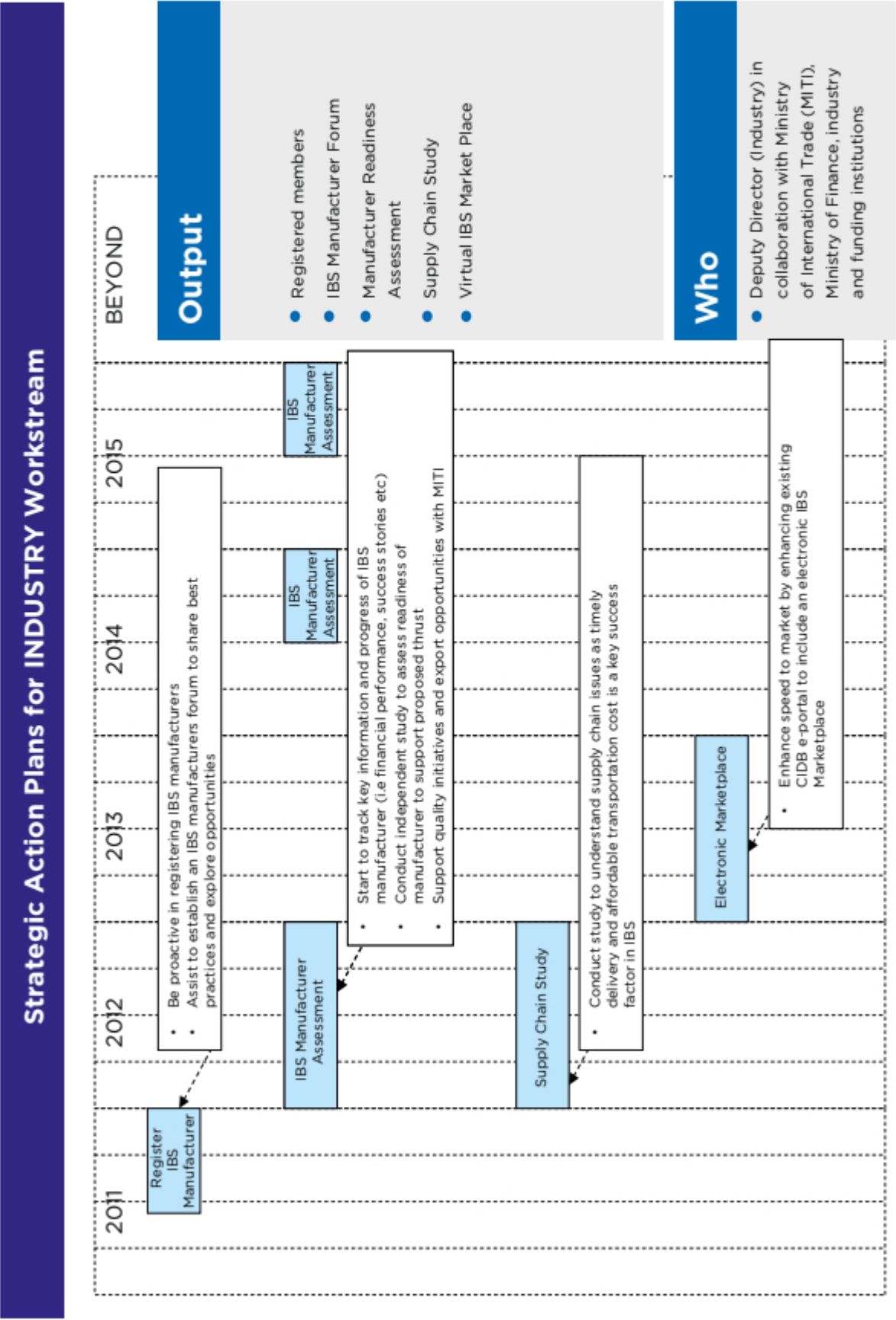
3. Strategies and Action Steps

Strategy	Actions Steps
❶ Rejuvenate IBS manufacturers	<ol style="list-style-type: none"> i) Set up Task Force to proactively review registration process and register all IBS manufacturers ii) Facilitate the setting up of an IBS Manufacturer Forum / Association iii) Conduct readiness assessment of the IBS manufacturers
❷ Support rapid transformation of IBS manufacturers with potential for innovation	<ol style="list-style-type: none"> i) Support rapid transformation of IBS manufacturers with potential for innovation by facilitating financial and technical support for IBS manufacturer in innovative and technologically advanced areas, to encourage R&D ii) Revisit incentive framework to promote innovation and facilitate timely access to funding for business activities
❸ Smoothen the process (from approval to IBS products arriving on-site) and help projects to be completed on-time	<ol style="list-style-type: none"> i) Smoothen the process (from approval to IBS products arriving on-site) and help projects to be completed on-time (quick delivery) by reviewing supply chain (from plant to construction site) to find areas for improvements ii) Improve speed to market by enhancing existing CIDB e-portal to include an electronic IBS Marketplace for Matching Demand to Suppliers of IBS components
❹ Re-energise private sector participation	<ol style="list-style-type: none"> i) Re-energise private sector participation by 50:50 representation in IBS Consultative Forum. Consistent with the need to drive greater private sector participation, the MoW-led IBS Consultative Forum will be represented by the public and private sector ii) Create a Skills Council to capture industry needs

Expected Outcome

- 1 A robust IBS manufacturing industry that is innovative and supportive
- 2 Accreditation of products as a recognised quality and with good standard
- 3 Availability of skilled personnel
- 4 Ability to supply IBS components in a commercially viable way

Figure 4.5 Action Plan for Industry Focused Activities



4.2 Branding of IBS

IBS in the past have been associated with high cost (as acknowledged in the Construction Industry Master Plan (CIMP) 2006-2015, pg 54, where it is stated that the usage of IBS would result in a cost increase of 10% compared to conventional construction methods) and plagued with bad publicity (e.g. leakage issues, the repair and maintenance aspects).

It is important to remember that IBS is a construction process – a methodology and not a building. Thus, IBS should not be linked with a particular design; it is the clever use of IBS that would change the former perception.

The following branding messages are being considered:

“IBS Method of Construction is Progressive”

Perceptions of IBS buildings resembling low cost housing projects which are basic and pay minimal attention to the aesthetics of the building must be avoided and removed.

Thus, the message must be clear that IBS emphasises on the components being “industrialised” but does not specify any building designs.

The design of the building is therefore left to the imagination of the designer, and in fact, simplification of designs can produce beautifully built homes.



“IBS Method can be Green”

Many research reports have confirmed that IBS would reduce on-site workers as well as ensuring a speedier/timely delivery of buildings and infrastructure.

With these two positive outcomes of using IBS, IBS should be linked to promote a greener construction industry based on the following:

- Speedier completion means less site pollution
- More planning done before installation means greater reduction of on-site wastes
- Components are optimised, thus less wastage / variance during construction

Most Green Building Rating systems include the design and construction stage. IBS can play a role in making buildings more “GREEN”.

Currently, Green Building Index (GBI) has allocated 4 points for non-residential buildings and 5 points for residential buildings if certain IBS criteria are met. In the future,

it is envisaged that further collaboration between the IBSO and Green Building Initiatives could lead to IBS playing a more significant role in promoting a “Greener” Malaysia.

“Creation of an elite group of IBS Para-Professionals”

An apprentice programme should be carried out to promote the industry.

Currently, the construction industry is seen as a low-skilled industry, with minimal job security. This hampers the effort to attract more Malaysians back to the trade. With this programme, selected candidates can be turned into elite IBS para-professionals, shredding the old image of construction workers. Thus, the job security issue will also be addressed through contracted periods of employment with premium salary packages.

“IBS Signature Project”

The Ministry of Education has planned to set up 4,194 new preschool classes by 2012. As this project, being part of public sector construction, would need to be constructed using the IBS method, this golden opportunity can be capitalised to showcase the flexibility and advantages of using IBS during construction. The preschool project can be a green field for designers, IBS manufacturers, contractors and policy makers to work together to create preschool designs and buildings that are progressive looking as well as children and environment friendly. Malaysian parents would also have a first hand opportunity to observe and utilise an IBS built preschool facility.

4.3 Change Management

Many effective change management methodologies have a significant focus on the communication plan. Whilst this is a very important part of change management, what is more important is the commitment of the stakeholders to the journey of “change” which can be achieved through the communication of a clear direction and view of the end game.

4.4 Conclusion

In conclusion, this Chapter has laid out specific programmes for the public and private sector respectively given their different levels of adoption. The execution of the Roadmap is put together in the Implementation Plan narrowed to the different work-streams with each having a specific focus relating to IBS implementation.

The IBSO is the implementation unit to anchor the execution of the Implementation Action Plans for the Roadmap.

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Chapter 5

Empowering to Drive the Bold Changes



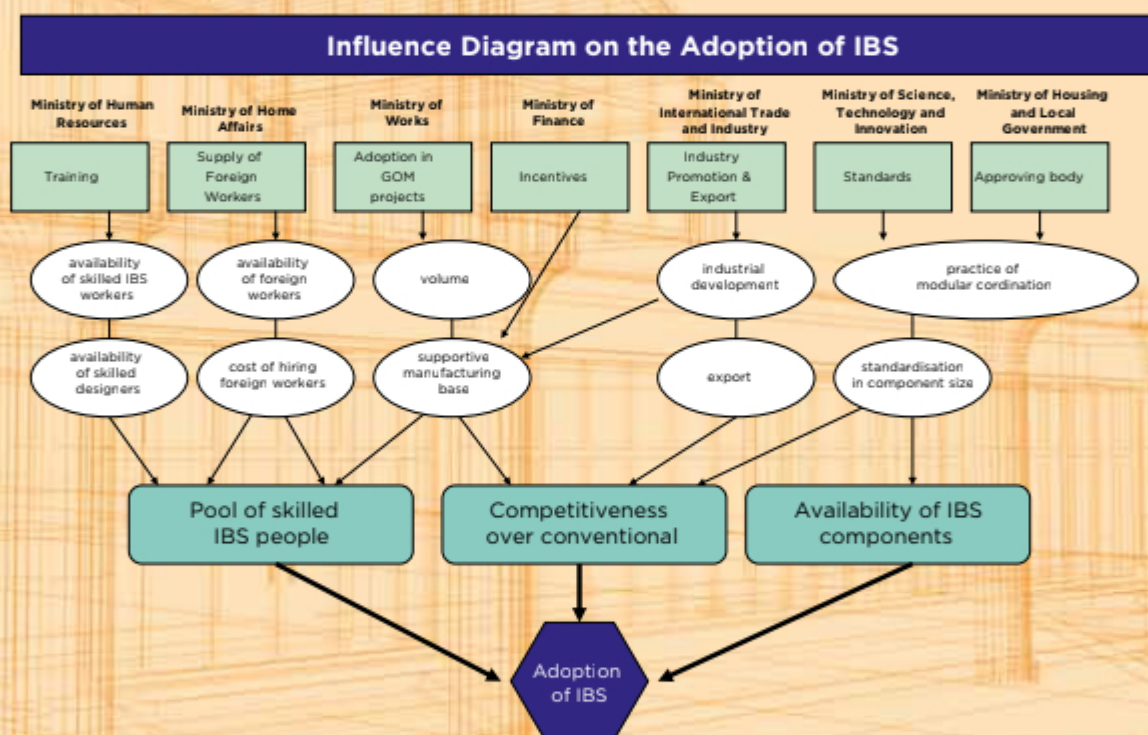
Empowering to Drive the Bold Changes

This Chapter provides a compelling reason for a dedicated, strong and well-resourced organisation to drive the implementation of the IBS Roadmap 2011- 2015.

5.1 The Need for an Organisation to Drive Bold and Difficult Changes

It is important to recognise that the adoption of IBS is not only determined by the efforts of CIDB and the Ministry of Works (MoW) alone but would also be the product of joint developmental efforts amongst 7 various ministries. See Figure 5.1

Figure 5.1 Influence Diagram on the Adoption of IBS



It is envisaged that the current machinery (combination of committee based management supported by a unit within CIDB) will face difficulties in making decisions at the speed required to be able to implement the Roadmap.

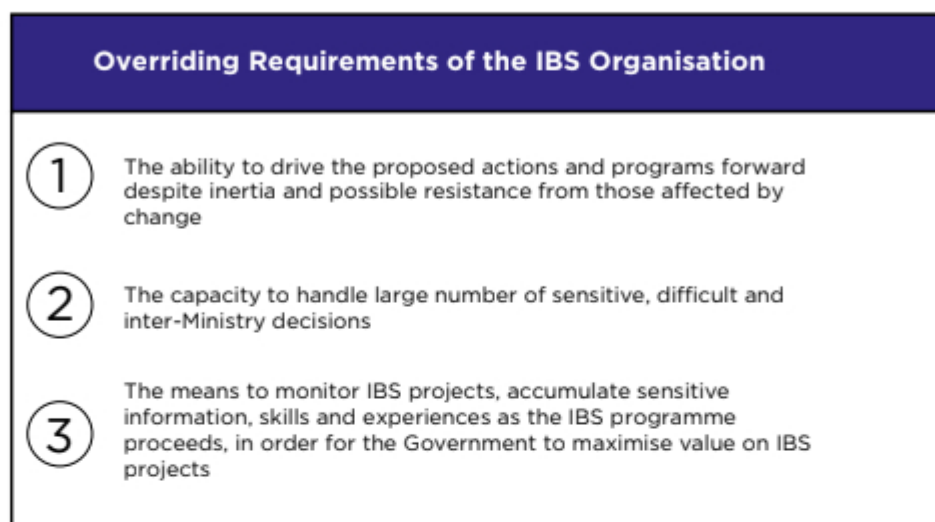
Thus, a stronger enabling institution i.e. an IBS Organisation (IBSO), is required to facilitate policy coordination between the 7 ministries.

As the country's champion for IBS, the IBSO will forge a close working relationship with all the various Ministries and the private sector to achieve the Roadmap's objectives.

Going forward, there is a obvious need for a single, clear, accountable and strong

organisation to expedite achievement of policy objectives for the betterment of the industry. See Figure 5.2

Figure 5.2 Overriding Requirements of the IBS Organisation



In the new structure, the current committee-based operating framework which has worked to ensure the adoption of IBS in the public sector will move towards another level of accountability and efficiency by transferring some of the current monitoring role to IBSO. As the Circular 7/2008 has already been put into effect, IBSO can help to monitor the compliance aspect on a day-to-day on the ground basis and recommend ways to overcome any obstacles during implementation in the public sector.

The IBS Consultative Forum is needed to steer the IBSO implementers as it is envisaged there will be many challenges in the implementation stage. To facilitate this, there will be private sector participation in this IBS Consultative Forum.

The following are the immediate uphill tasks for the IBSO, emphasising the need for a strong and empowered organisation:

- ☑ Co-ordinate policy making across the related ministries with the sole objective of removing obstacles (i.e. lack of standardisation and skills issue in the industry). The policy making process requires meticulous research, availability of database and information on best practices and lessons learnt in past executions.
- ☑ Set guidelines and standards for IBS implementation and actively enforce the Treasury Circular 7/2008.
- ☑ Implement approved recommendations and policies for IBS implementation. As an example, an IBS policy made at the Ministerial level needs to be cascaded down to each of the officers in the state local authorities. If MS1064 is mandated, the approving officer at each of the state local authorities needs to ensure compliance. State governments and/or local authorities must not only be recognised for performing a good job, there must also be mechanisms to reprimand or even penalise them in the case of non-conformance to ensure compliance. There will be a need by the IBSO to manage the implementation process for IBS especially in light of the state government's statutory rights and jurisdictions.

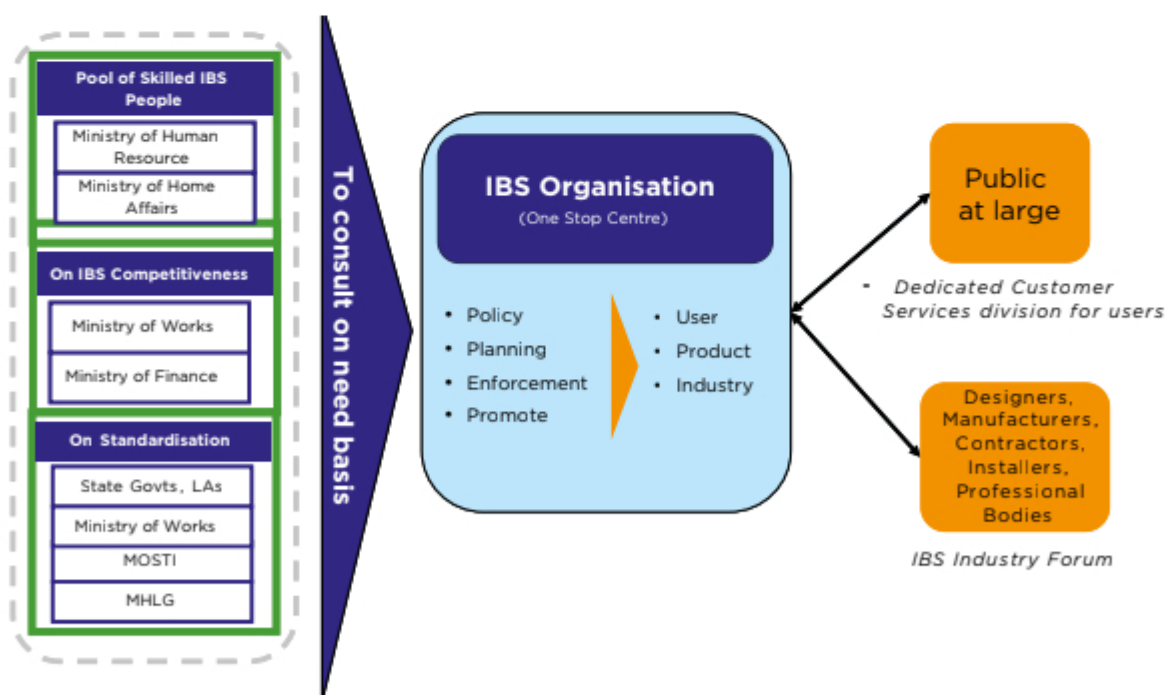
- ☑ In long term planning to support the construction industry, the IBSO needs to address the skills issue. Through continuous education, training and development programmes, the IBSO is tasked to create a pool of highly skilled and respected IBS professionals and para-professionals. Much effort has been put into this in the past, but Malaysians continue to shy away from the construction industry. In order to rectify this, the IBSO may be required to review the current employment terms and conditions within the construction industry to recommend a revision to current practices that may be an impediment.
- ☑ To address the issue of foreign labour, which some believe has a major impact on the implementation of IBS, a strong collaboration is required with the Ministry of Human Resources for planning purposes, and the Ministry of Home Affairs for enforcement.

5.2 IBS Industry Framework

The IBSO will be the one-stop centre to cater to the needs of the public and the industry. A dedicated customer service will help to address the needs of users such as contractors and building owners. An IBS industry forum will be established to obtain feedback from the industry, also providing a platform for brainstorming and collaboration.

Concurrently, various Ministries will provide guidance and facilitate the adoption of IBS through the introduction of pragmatic policies. See Figure 5.3.

Figure 5.3 IBS Industry Framework

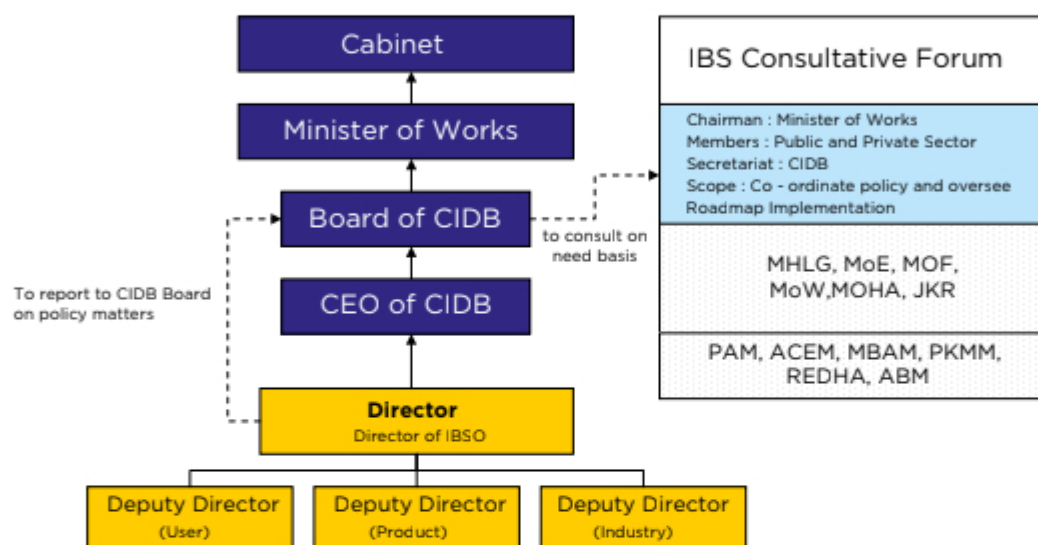


5.3 IBSO Governance and Management Structure

The IBSO will consult the IBS Consultative Forum, chaired by the Minister of Works. The IBS Consultative Forum will be formed with representation from both the public sector and private sector to coordinate policies and oversee the execution of the Roadmap.

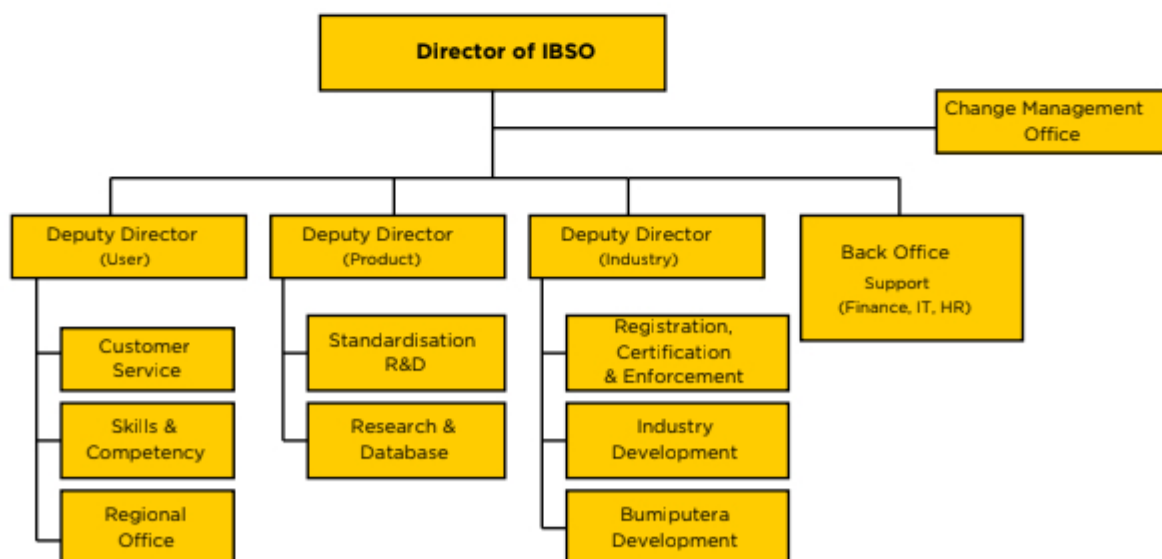
See Figure 5.4.

Figure 5.4 IBSO Governance Structure



The IBSO will be headed by a Director reporting to the Chief Executive (CEO) of CIDB. The Director will be accountable to deliver the uphill tasks identified earlier. See Figure 5.5.

Figure 5.5 IBSO Management Structure



5.4 Conclusion

The organisation that will be tasked to execute the Roadmap will be empowered, strong and well-positioned to push through the bold changes ahead.

