



ASEAN ICT MASTERPLAN 2015 COMPLETION REPORT

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INTRODUCTION

The ASEAN ICT Masterplan 2015 (AIM 2015) has come a long way and will be completed by the end of 2015. Since its launch in 2011, the AIM 2015 has provided a framework and roadmap for the development of information and communication technology (ICT) at the regional level and, as a result, has enabled greater ICT development in ASEAN.

Over the past five years, ICT in ASEAN has improved in many respects. At the macro level, exports of ICT services have become a larger component of total service exports, suggesting that ICT is today an important engine of economic growth in the region. At the individual level, costs of internet access and mobile subscription have fallen sharply in ASEAN Member States (AMS), allowing greater connectivity for millions of ASEAN citizens. The advancement of ICT in ASEAN is also evident in other aspects; these include the rise in employment in the ICT sector, the transformation of government services into digital ones, and the increased awareness of cybersecurity, to name a few.

Although many factors also played a contributing role in such developments, the AIM 2015 has been a vital instrument in bringing about efforts and endeavours of the AMS. The AIM 2015 supported the vision of AMS by bringing about many of the actions that account significantly for the region's advancement. Without a doubt, the progress in the fields of ICT would not have come this far without the AIM 2015.

Now that the end of 2015 is close and the AIM 2015 has generated tangible results in various aspects across the region, it is reasonable to look back and evaluate what has been accomplished. It is also of importance to provide policy recommendations that would allow for the good work of the AIM 2015 to be continued into the post-2015 era. As such, the final review of AIM 2015 was proposed at the ASEAN Telecommunications

and IT Senior Officials (TELSOM) Joint Working Group Meeting in January 2014. The meeting's participants agreed to conduct a final review on AIM 2015, prior to the launch of the next ASEAN ICT Masterplan during the 15th ASEAN Telecommunications and IT Ministers Meeting (TELMIN) in Viet Nam.

The report will be structured in sections, starting with this introductory section. Section 2 will then give an overview of the overall status of the AIM 2015, which has reached 100% completion even before the due date. Section 3 provides an evaluation of the AIM 2015 based on the extent to which it achieves its key outcomes as well as the extent to which it has contributed to the larger objective of promoting ASEAN as an integrated community. In section 4, the allocation of resources is analysed (i.e. whether the finances and endeavours spent on the projects which were rolled out as AIM 2015 implementation tools have been allocated appropriately). Section 5 features case studies to illustrate the activities and outcomes arising from projects initiated by the AMS. In Section 6, statistics on several aspects of ICT development in ASEAN are displayed in order to illustrate the impact of AIM 2015. Finally, Section 7 concludes and suggests policy recommendations post-2015.



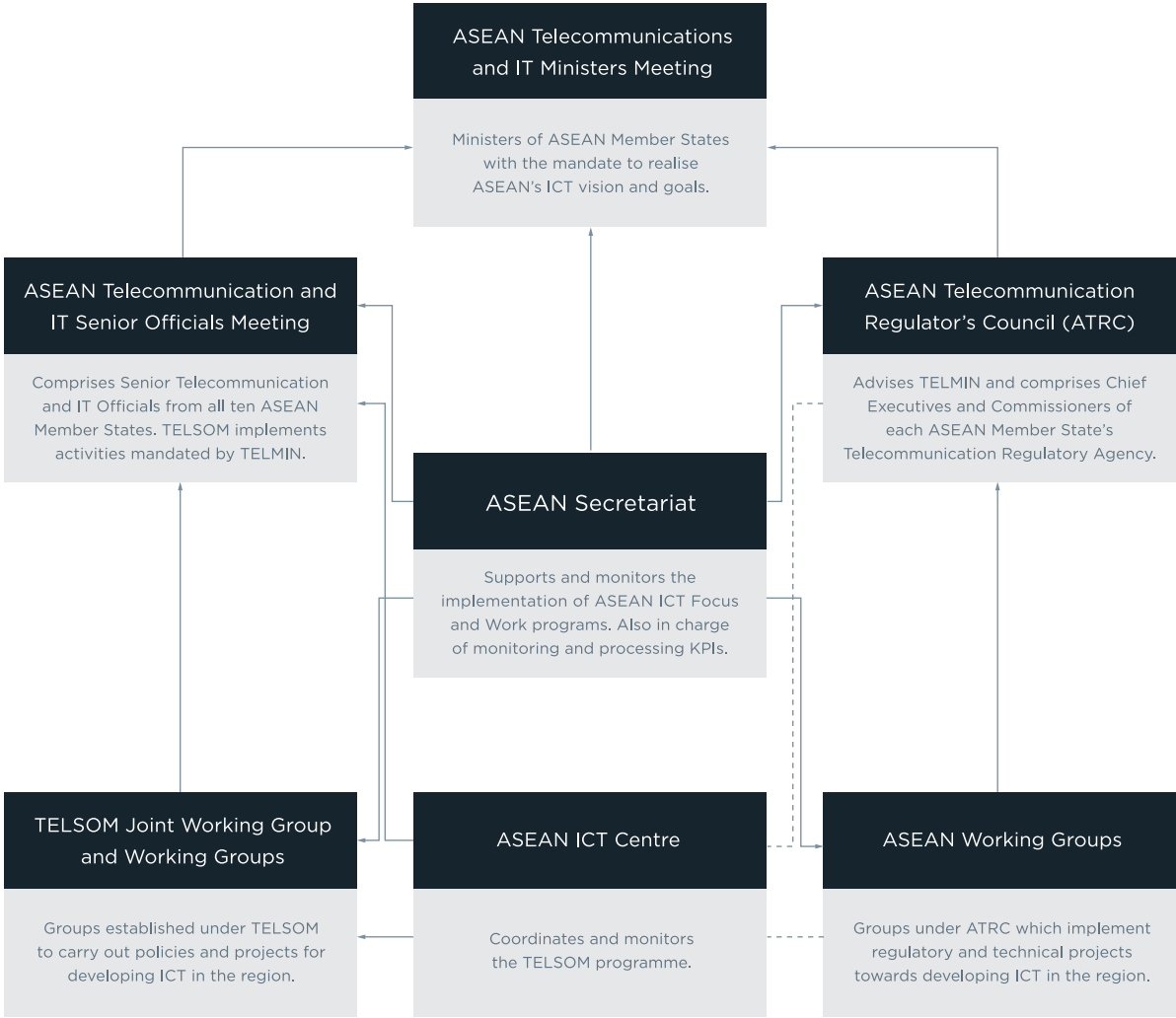
OVERVIEW & OVERALL STATUS OF AIM 2015

The AIM 2015 was launched at the 10th ASEAN Telecommunications and IT Ministers Meeting (TELMIN) in January 2011. In implementing the AIM 2015, a number of entities worked together to manage various actions. Policy formulation is directed by the ASEAN Telecommunications and IT Ministers Meeting (TELMIN), which is supported by the ASEAN Telecommunications and IT Senior Officials Meeting (TELSOM) and the ASEAN Telecommunication Regulators' Council (ATRC). TELSOM and the ATRC also have their supporting Joint Working Group and Working Groups. The ASEAN Secretariat plays a coordinating role and the ASEAN ICT Centre monitors the operationalisation of the overall programme.

Figure 1

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AIM 2015 Governance Structure



Source: ASEAN ICT Masterplan 2015

The AIM 2015 has been expected to deliver the following four key outcomes:

- ICT as an engine of growth for ASEAN countries
- Recognition for ASEAN as a global ICT hub
- Enhanced quality of life for the people of ASEAN
- Contribution towards ASEAN integration

To this end, six Strategic Thrusts which comprise three pillars and three foundations have been set in the AIM 2015. The three pillars are “economic transformation”, “people engagement and empowerment”, and “innovation”, while the three foundations are “infrastructure development”, “human capital development”, and “bridging the digital divide”. The objectives of these Strategic Thrusts are as follows.

Economic transformation: ASEAN will create a conducive business environment to attract and promote trade, investment and entrepreneurship in the ICT sector. ICT will also be the engine that tranforms other sectors of the economy.

People empowerment and engagement: ASEAN will enhance the quality of life through affordable and equitable ICT.

Innovation: ASEAN will foster a creative, innovative and green ICT sector.

Infrastructure development: ASEAN will develop ICT infrastructure to support the provision of services to all ASEAN communities.

Human capital development: ASEAN will develop competent and skilled human capital in ICT to support the growth of the ICT sector and help transform other sectors of the economy.

Bridging the digital divide: ASEAN will address the varying levels of ICT development and adoption within individual countries and across the region. ASEAN will also focus on bridging other gaps within the digital divide to promote greater adoption of ICT.

Under each Strategic Thrust lies Initiatives that serve as the direction to which ICT development will move. Furthermore, for each Initiative, the AIM 2015 lists Action Points that specify what needs to be done in order to meet the objectives of each Strategic Thrust. The said Initiatives and Action Points are listed in Table 1

Table 1

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AIM 2015’s
Strategic Thrusts, Initiatives
and Action Points

Strategic Thrusts	Initiatives and Action Points
1. Economic Transformation	<p>Initiative 1.1 : Create a conducive environment where businesses can grow leveraging ICT</p> <ul style="list-style-type: none">• Facilitate sharing and exchanging of business information amongst ASEAN countries• Develop a framework to facilitate transparent and harmonised ICT regulations <p>Initiative 1.2 : Develop Public-Private Partnership (PPP) initiatives for the ICT industry</p> <ul style="list-style-type: none">• Share various PPP models and practices amongst ASEAN countries to formulate PPP models for the implementation of ICT projects
2. People Engagement and Empowerment	<p>Initiative 2.1 : Ensure affordable broadband access to every community</p> <ul style="list-style-type: none">• Study to lower intra-ASEAN roaming charges <p>Initiative 2.2 : Ensure affordable ICT products</p> <ul style="list-style-type: none">• Enhance implementation of mutual recognition arrangements (MRAs) <p>Initiative 2.3 : Ensure affordable and seamless e-services, content and applications</p> <ul style="list-style-type: none">• Survey and study to identity gaps and determine e-services to be developed• Provide incentives or grants to promote e-services and content development

Strategic Thrusts	Initiatives and Action Points
	<p>Initiative 2.4 : Build trust</p> <ul style="list-style-type: none">• Promote secure transactions within ASEAN• Outreach campaign to promote awareness of cyber-security
3. Innovation	<p>Initiative 3.1 : Create Innovation Centres of Excellence (COE) for Research and Development (R&D) of ICT services</p> <ul style="list-style-type: none">• Establish networks of COEs• Develop ASEAN digital content exchange• Promote Intellectual Property Rights (IPR) at ASEAN level to safeguard innovation <p>Initiative 3.2 : Promote innovation and collaboration amongst government, businesses, citizens and other institutions</p> <ul style="list-style-type: none">• Recognise and reward ICT innovators• Launch the ASEAN CIO forum <p>Initiative 3.3 : Nurture innovation and creativity at schools</p> <ul style="list-style-type: none">• Ensure every child has access to broadband internet
4. Infrastructure Development	<p>Initiative 4.1 : Improve broadband connectivity</p> <ul style="list-style-type: none">• Establish an ASEAN Broadband Corridor• Establish an ASEAN Internet Exchange Network

Strategic Thrusts	Initiatives and Action Points
	Initiative 4.2 : Promote network integrity and information security, data protection and CERT cooperation <ul style="list-style-type: none">• Develop common framework for network security• Develop common framework for information security
5. Human Capital Development	Initiative 5.1 : Build capacity <ul style="list-style-type: none">• Develop a registry of experts and innovators• Create ASEAN ICT Scholarship Programme Initiative 5.2 : Develop skills upgrading and certification <ul style="list-style-type: none">• Establish MRA for skill certification• Develop ICT certification and skills upgrading programme
6. Bridging the Digital Divide	Initiative 6.1 : Review of Universal Service Obligation (USO) or similar policies <ul style="list-style-type: none">• Review of USO or similar policies Initiative 6.2 : Connect schools and advocate early ICT education <ul style="list-style-type: none">• Prioritise roll-out to schools• Collaborate between ICT and education sectors within ASEAN• Promote ASEAN integration through exposure to different cultures within ASEAN at an early age Initiative 6.3 : Improve access and relevance of information <ul style="list-style-type: none">• Collaborate with relevant ministries

Strategic Thrusts	Initiatives and Action Points
	Initiative 6.4 : Bridge the digital divide within ASEAN <ul style="list-style-type: none">• Bridge the digital divide within ASEAN

Source: ASEAN ICT Masterplan 2015

Over the past five years, numerous endeavours have been carried out by the AMS to meet the objectives of the AIM 2015. This is reflected in the large number of projects undertaken by ASEAN. In total, 87 projects were initiated during the period of 2011-2015. At the time of this Report going to print, a small number of projects are still ongoing; however, the AIM 2015 can still be considered completed, notwithstanding these few remaining projects. In this case, “completed” means that each and every Action Point has been successfully addressed by at least one completed project. In fact, most Action Points have been acted upon by more than one successfully completed project, as the total number of projects under the AIM 2015 is far greater than the number of Action Points.

The full list of AIM 2015 projects and their associated Action Points is provided in the Appendix.

Before moving on to the next section to evaluate the AIM 2015, it is worth recalling its progress as of the AIM 2015 Mid-term Review. The Mid-term Review was published in late 2013. At the time, 62% of the Action Points were completed, 24% were ongoing and 14% were at risk of not being fulfilled. Since then, the efforts of the AMS have resulted in all of the Action Points being completed in a timely manner. This achievement reflects the commitment of the AMS to work together towards the completion of the AIM 2015 and underlines how collaboration between the AMS has brought about fruitful results. The AMS can therefore look forward to the implementation of the next ASEAN ICT Masterplan (AIM 2020) with enthusiasm and expect, once again, to undertake collaborative efforts to further the advancement of ICT in the region and to foster the quality of life through the use of ICT.



EVALUATION OF AIM 2015

As mentioned in the previous section, the AIM 2015 is considered 100% completed with all of the Action Points having been addressed by at least one completed project. The completion of the AIM 2015, however, is not an end in itself. Rather it is a means towards the four key outcomes that the AIM 2015 is expected to deliver. Hence, it is important to think of the success of the AIM 2015 in terms of the extent to which it achieves these outcomes.

With the vision of “Towards an Empowering and Transformational ICT: Creating an Inclusive, Vibrant and Integrated ASEAN”, the AIM 2015 is intended to yield four key outcomes.

- ICT as an engine of growth for ASEAN countries
- Recognition for ASEAN as a global ICT hub
- Enhanced quality of life for the people of ASEAN
- Contribution towards ASEAN integration

The abovementioned vision and outcomes can be fulfilled through the outcomes at the Strategic Thrust level. Each of the six Strategic Thrusts, as will be seen in more detail later in this Section, has delivered what it was expected to do, and the impact created by proceedings under each Strategic Thrust has enabled ASEAN to achieve the four key outcomes of AIM 2015.

ICT as an engine of growth for ASEAN countries

ICT is indeed an important driver of growth in ASEAN. In this region, where the economy is significantly influenced by exports, ICT has a major role to play. For example, in countries such as Indonesia, Malaysia, the Philippines and Singapore, over a quarter of total service exports are related to ICT services. A large extent of these exports is driven by small and medium enterprises (SMEs).

Projects under the AIM 2015, especially those in Strategic Thrust 1 and Strategic Thrust 4, have helped promote the economic activities of many SMEs and large enterprises alike by creating a business environment where business can grow and by supporting SMEs in adopting ICT technology favourable to their transactions. A specific example is a project entitled “Promote and Encourage the Deployment of IPv6 for Small and Medium Enterprises (SMEs)” in Strategic Thrust 1. Endeavours undertaken in support of Strategic Thrust 4 have also provided sound infrastructure, especially with regard to the network and information security on which businesses rely. The stronger security which has been a product of AIM 2015 activities can encourage business enterprises to engage more in leveraging their business.

Recognition for ASEAN as a global ICT hub

ASEAN has become more widely recognised as an ICT hub, while the ICT innovation within ASEAN has also become increasingly prominent. The ASEAN score for the pillar on Innovation under the Global Competitiveness Index reveals that ASEAN has been improving in this respect. The gap between ASEAN and the rest of the world has narrowed tangibly.

Activities under Strategic Thrust 3 are responsible in part for placing ASEAN in this position. The current atmosphere and environment is conducive to the innovation of new products and new technology. This is partly due to the recognition within the region achieved through an annual awards event which stimulates creativity and enthusiasm among businesses.

R&D activities are also an area of emphasis in the region. Attempts to establish centres of excellence indicate the readiness of the AMS to take research and development to another level and it is no exaggeration to say that, once fully operationalised, the AMS will be in a stronger position to create, innovate, and move forward in the ICT world.

Enhanced quality of life for the people of ASEAN

Millions of lives have engaged with and been empowered by ICT. Without doubt, this has resulted in an enhanced quality of life. With easier access to the internet and ICT devices, ASEAN citizens can access various kinds of services that were previously unavailable to them.

Proceedings under Strategic Thrust 2 and Strategic Thrust 6 mainly contributed to this outcome. A number of projects have provided guidance to the ASEAN governments and business entities as to what services to provide to their citizens and how to provide them. The guidance arising from related activities reflected the need from the users’ perspective, rather than the convenience from the service providers’ point of view.

Secure transactions enhanced by suggestions taken from related projects also build trust among those who hesitate to engage with ICT technology.

People with limited opportunities or disabilities as well as those not used to ICT technology have also been made familiar with digital technology and trained to reap the benefits from its usage. Activities to this end have been conducted on a country-to-country basis. Although small in scale, these activities have proved effective in helping those who might otherwise not have achieved the level of ICT literacy required to take advantage of the benefits of ICT.

Contribution towards ASEAN integration

As will be seen later in this section, the contribution made by the AIM 2015 towards ASEAN integration is paramount. It has contributed greatly to the two plans of ASEAN, which are (1) The Master Plan on ASEAN Connectivity and (2) The AEC Blueprint.

As regards the proceedings under the AIM 2015 which contributed to the greater integration, Strategic Thrust 5 enables skilled labour to move with greater mobility across the ASEAN region. This is because ASEAN is equipped with a tool that enables employees to make better decisions in hiring new employees and, as a result, facilitate the movement of labour. The implementation of Mutual Recognition Agreements (MRAs) on product standards would also be a vital factor in creating a freer flow of goods.

To sum up, the four key outcomes of the AIM 2015 have been achieved through the implementation of six Strategic Thrusts. Not only has the AIM 2015 been completed with a total of 87 projects addressing all of the Action Points, but it has also been successful in delivering the desired outcomes hoped for at the outset of the plan.

As a result of accomplishing the four key outcomes, the AIM 2015 has achieved its vision accordingly. ASEAN is now a region where ICT is **empowering** its people, **transforming** the way people live, and improving the economy. It is also an **inclusive** region in which different groups of citizens now have greater opportunities to leverage ICT, a **vibrant** place with a high degree of innovation and development, and an **integrated** region which enables its citizens to be better connected and mobilised.

In the big picture, the AIM 2015 has been completed with its targeted outcomes and vision having been achieved. The next step is to evaluate it at the Strategic Thrust level.

Strategic Thrust 1

Economic Transformation

Under this Strategic Thrust, the AMS intend to create a conducive business environment to attract and promote trade, investment and entrepreneurship in the ICT sectors via activities under the two following Initiatives: (1) Create a conducive environment where business can grow leveraging ICT and (2) Develop Public-Private Partnership (PPP) Initiatives for the ICT industry.

To create a conducive environment for businesses, ASEAN has made significant progress in developing a framework to facilitate transparent and harmonised ICT regulations. Examples of projects that contributed to this development include “ASEAN Telemedicine Protocol and Standards Harmonisation” and “Promote and Encourage the Deployment of IPv6 for Small and Medium Enterprises (SMEs)”. The former project promoted the sharing of knowledge, best practices, standards, needs, and challenges in the practice of telemedicine among the AMS. It is expected that this will evolve into the development of a platform for knowledge sharing and the harmonisation of standards and policies. The project entitled “Promote and Encourage the Deployment of IPv6 for Small and Medium

Enterprises (SMEs)” yielded a tangible significant result. It produced a set of ICT recommendations for SMEs migrating from IPv4 to IPv6. Subsequently, Viet Nam, using the findings of the project, went on to revise its National IPv6 Master Plan in October 2014.

Best practice models suitable for ICT partnerships were discussed in the project titled “PPP Model for ICT”. This project studied cases of successful PPP ventures in ICT and non-ICT industries and made recommendations on how the AMS should engage with their businesses using the PPP model.

Apart from what was mentioned above, the creation of a conducive business environment was also supported by other projects which included, among others, IPv6 Collaborationin ASEAN and Workshop for ASEAN ccTLD in the Adoption of IPv6 and DNSSEC in Domain Name System (DNS).

Having seen that each Initiative has been fulfilled and met its objective, it is reasonable to suggest that this Strategic Thrust is satisfactory in term of its completion. Nonetheless, it is noted that the goals set in the Action Points under this Thrust were generic. For instance, sharing PPP models may not lead to the widespread adoption of PPP. Facilitating the exchange of business information may not be as effective as setting up an actual platform on which such information can be shared and exchanged. Therefore, it may be appropriate to say that while this Strategic Thrust is successful in terms of completing the objective of its Action Points and a more conducive business environment has been fostered, more immediate and tangible impacts might have been achieved if the Strategic Thrust had been set with specific, measurable and more ambitious goals.

Strategic Thrust 2

People Empowerment and Engagement

The key outcome of this Strategic Thrust is to enhance the quality of life through affordable and equitable ICT.

With more widespread use of e-Services across the region, lower costs for a wide range of ICT products and services, and greater awareness regarding cyber security which helps build greater trust concerning the utilisation of ICT, it can

be said that this Strategic Thrust is successful in that it has contributed to the direction in which e-Services, which are believed to bring about benefits to everyday life, should be developed. In addition, it has helped raise the level of thrust and secure transactions within ASEAN.

One way in which the quality of life can be raised is to enable ASEAN citizens to access services previously unavailable to them and to reduce the costs of those services already available but with a relatively high cost. As for government services, the AMS are equipped with a list of 15 common e-Government services which would be beneficial to their citizens. The list was developed from the project on ASEAN e-Government Strategic Action Plan. Such a list helps the government understand the extent to which each of the services should be prioritised. In addition, the project on ASEAN e-Service Identification informed the AMS of the sectors of e-Services most required by ASEAN citizens. Such services are e-Government, e-Education, and e-Health.

One factor that deters a large section of the population from utilising e-Services is a lack of trust. Proceedings under this Strategic Thrust have helped address this problem by specifying the laws/regulations necessary for building the trust required in performing electronic transactions. In addition, ASEAN is also now equipped with suggestions and guidelines to meet the requirements on the technical and organisational aspects involved in electronic authentication. One relevant project that played an important role in generating this outcome is “Intra-ASEAN Secure Transactions Framework”.

ASEAN has also made efforts to make affordable broadband access available to every community by conducting an ASEAN-EU Workshop on Voice and Data Roaming. Although the workshop provided useful information to the AMS on the experiences of the EU as well as the benefits and challenges of implementing a reduction in mobile roaming charges, the outcome regarding actual agreement among the AMS on reduced charges is yet to be seen on a regional scale. It is however encouraging to note that Brunei Darussalam, Malaysia and Singapore have formalised roaming arrangements among themselves.

One more area in which ASEAN still needs to make further efforts is to create affordable ICT products. While advances in technology have naturally driven down the costs of ICT products, the AMS can contribute more to this matter by harmonising their standards. Certain projects such as “Survey of Existing Standards of ICT Products and Services in ASEAN with a Pilot Study on Common Software Development Standards” and “Enhancing and the Implementation of MRA in the

ASEAN Region” have been created and completed but the adoption of a common standard by the AMS to reduce time-to-market still needs further development.

All in all, this Strategic Thrust has been fairly successful. It has contributed significantly to how people enhance their life through the use of the Internet and e-Services. However, more efforts will be required to lower the cost of broadband roaming and the implementation of MRAs

Strategic Thrust 3

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Innovation

The expected outcome of this Strategic Thrust is the creation of a creative, innovative, and green ICT sector.

Having reviewed the relevant Initiatives, Action Points and Projects, it can be seen that, although “green ICT” is specified as a key outcome, the objectives of each Action Point do not have sufficient relation to “green ICT”. At the project level, there have also not been sufficient attempts to promote this issue as there is only one completed project dedicated to it. The project concerned is “Workshop on Promoting Green ICT and Green Growth for Sustainable Development in ASEAN Member Countries”.

Apart from the issue of green ICT, the activities under this Strategic Thrust have yielded satisfactory outcomes. ASEAN has been able to stimulate creativity and innovation among entrepreneurs. This is reflected in the success of the ASEAN ICT Awards, which is an annual event that has continued to encourage innovation and generated enthusiasm and interest among them, thus motivating them to compete in international markets.

ASEAN also provides CIOs across the region with a platform to exchange best practices as well as to provide networking and relationship building opportunities among ICT players. This has been created by an AIM 2015 event called the ASEAN CIO Forum which was launched in April 2012.

Concerning R&D activities, work towards the establishment of Centres of Excellence (COE) is believed to be instrumental in promoting R&D, innovation, and the transfer of technology. One relevant project is “Workshop on Promoting the Establishment and Connection of ICT Centres of Excellences (COE) in ASEAN Countries”, held in February 2014 in Hanoi. The project’s outcomes included an announcement of the establishment of an ASEAN ICT COE Network, the launch of an ASEAN ICT COE Network website, and an agreement to cultivate an ASEAN ICT COE network, among others.

Regarding the evaluation of this Strategic Thrust, it is viewed that this Thrust has achieved satisfactory outcomes in creating an environment conducive to creativity and innovation. This is evident in a KPI on Innovation to be shown in Section 6. However, the outcome on green ICT is not as apparent.

One lesson learned from assessing this Strategic Thrust is that it is important to set clear and measurable outcomes at the outset so that the AMS can propose appropriate projects that will lead to the desired impact.

Strategic Thrust 4

Infrastructure Development

The key intended outcome of Strategic Thrust 4 is for ASEAN to develop the infrastructure required to support the provision of ICT services to all ASEAN communities. While “all ASEAN communities” is too strong a phrase and is far from being fully achievable, the activities under this Strategic Thrust have contributed a great deal to the development of a regional infrastructure, although this has not yet reached all communities.

Statistics indicate that the provision of ICT services has become much more widespread and has reached millions more citizens. The number of people with access to ICT services such as the internet and mobile cellular services has increased significantly in several nations. The relevant data is shown in Section 6.

It is reasonable to say that part of the infrastructure development in ASEAN driven by the AIM 2015 is related to information and network security.

ASEAN has been successful in promoting network integrity and information security through a number of completed projects. One important activity that has contributed significantly to the enhancement of security is the establishment of the ASEAN Network Security Action Council (ANSAC), which is a yearly meeting in which regional cooperation is discussed. Examples of outcomes arising from ANSAC meetings include greater cybersecurity awareness, the establishment of a common framework for network security, and the development of an ASEAN cyber security incident handling and escalation procedure.

The AIM 2015 has also completed projects which have contributed to the improvement of broadband connectivity. These include, among others, “ASEAN Broadband Corridor” and “Plan to Increase Capacity Demand in ASEAN for the Next Five Years”. The former project has provided ASEAN not only with the framework to identify the key drivers that the AIM 2015 should focus on in order to drive broadband rollout but also with recommendations as to specific government initiations to influence each key driver of broadband rollout. The latter project helps in terms of enhancing the capacity of broadband internet in ASEAN by making the assessment of 10 countries and building a simulation model for scenario analysis of demand on ICT.

With the two Initiatives whose objectives have been fulfilled and the various endeavours that have helped enhance cooperation on security and broadband connectivity, it can be concluded that this Strategic Thrust has been successful.

Strategic Thrust 5

Human Capital Development

This Strategic Thrust has yielded fruitful outcomes. Its objective is to develop competent and skilled human capital to support the growth of the ICT sector and help transform other sectors of the economy.

A main contribution of the projects under this Strategic Thrust is to help skilled ICT labour move more freely across nations and/or to places where ICT professionals are needed the most. This would enable countries with demand for ICT skills but a shortage of such supply to fulfil their needs and drive the local economy with labour from abroad. ASEAN is equipped with a tool to accommodate this, i.e. a mapping table which compares the competency levels/qualifications of ICT

skills in different countries. With such a table, potential employers can make better hiring decisions which would in turn enable a better flow of skilled labour. At this stage, the mapping table developed in the projects ASEAN ICT Skill Standards Definition and Certification (Phase I and Phase II) covers seven fields of ICT skills. These are software development, ICT project management, enterprise architect design, network and system administration, information system and network security, cloud computing, and mobile computing.

In addition to labour mobility, the capacity of ICT human capital in ASEAN has also been enhanced through a number of additional projects. For instance, ASEAN now has a tool to encourage and attract new talent to carve out a career in ICT by providing an ASEAN ICT Scholarship. Despite the fact that the actual scholarship has not yet been awarded, ASEAN has completed a projection of the preparation requirements for the ASEAN ICT Scholarship, including the identification of funding sources and criteria for receiving the scholarship.

Moreover, the results from the “Forecast of ICT Human Resource Demand in ASEAN” project reveal that the ICT labour is still in short supply. This realisation should serve to assure those young talents who pursue a career in ICT that their skills will be required in the foreseeable and long-term future. As a result, they will be more inclined to acquire additional skills through further education.

The projects under the AIM 2015 have helped the AMS to attract more talent into the ICT field while also allowing existing professionals to move with greater flexibility. This clearly supports the growth of the ICT sector and helps transform other sectors in the regional economy.

Strategic Thrust 6

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Bridging the Digital Divide

Strategic Thrust 6 focuses on closing the ICT development gap within ASEAN through a range of Initiatives.

First of all, there have been attempts to connect schools and advocate early ICT education. Various projects under the AIM 2015 have exposed a large number of students to ICT technology and to different cultures. One of the highlighted projects is “ASEAN Cyberkids Camp”, which has been organised annually. The project has created a significant impact on promoting the development of ICT awareness and skills among the young participants. ASEAN has sought to strengthen collaboration between the ICT and education sectors in ASEAN and to help the region understand how ICT could be more integrated into the planning, design, and implementation stages of the education curriculum, assessment and pedagogy so as to enrich and transform the learning environment for students and equip them with the competencies and dispositions needed to succeed in a knowledge economy.

The gaps between different groups of people in terms of their ability have also been bridged by certain projects. These include “Training Program of ICT and IT for the Elderly and People with Disabilities” and “Free Open Source Software Adoption in Secondary Schools” with 23 IT teachers and 200 students having been trained on FOSS adoption.

As far as bridging the digital divide is concerned, the AMS have moved in a desirable direction and the activities under Strategic Thrust 6 have individually and collectively helped bridge the digital divide in many respects. This Strategic Thrust has indeed been successful and it is desirable that similar endeavours will be implemented over the period of AIM 2020.

In addition to the evaluation described above, one may also consider the success of the AIM 2015 based on the impact it has made on ASEAN integration in a broader context. It is appropriate, therefore, to consider the AIM 2015 on the basis of how it has contributed to the greater plans of ASEAN nations. The plans include (1) The Master Plan on ASEAN Connectivity and (2) The ASEAN Economic Community Blueprint (AEC Blueprint).

AIM 2015 and the Master Plan on ASEAN Connectivity

As far as the goal of the Master Plan on ASEAN Connectivity is concerned, the Master Plan aims to connect ASEAN through (1) enhanced physical infrastructure development (physical connectivity), (2) effective institution arrangements (institutional connectivity), and (3) empowered people (people-to-people connectivity).

Under each type of connectivity, Strategies and Key Actions specifying the activities to be undertaken in order to achieve the tangible outcomes are identified. Having considered the Key Actions under each strategy of the Master Plan and Initiatives and Actions Points under the AIM 2015, it can be said that the AIM 2015 contributes directly to Strategy 5 of Physical Connectivity (Accelerate the development of ICT infrastructure and services in each of the ASEAN Member States) as well as to the two strategies of People-to-People Connectivity (Promote deeper intra-ASEAN social and cultural understanding and Encourage greater intra-ASEAN people mobility).

The 5th Strategy of “Physical Connectivity” was addressed by several projects under the AIM 2015 including:

- ASEAN Broadband Corridor
- ASEAN Cyberkids Camp
- Sub Marine Cable Protection
- In-depth Study on the Harmonisation of Interconnection, Licensing, Competition and USO
- Free Open Source Software Adoption in Secondary Schooling

The AIM 2015 also has a significant role in fulfilling the two objectives of strategies of People-to-people Connectivity. The two strategies have been addressed by AIM 2015 projects including:

- Community e-Classroom
- Develop a Registry of Experts and Innovators
- ASEAN ICT Skill Standards Definition and Certification (Phase I and Phase II)

Not only have many activities under the AIM 2015 addressed various Key Actions in the Master Plan, a few activities have also contributed to projects prioritised for ASEAN Connectivity. The Master Plan identified 15 prioritised projects, two of which are ICT related. These are:

- Establish an ASEAN Broadband Corridor (ABC)
- Develop ICT Skill Standards

The former was fulfilled by an AIM project under the same name and the latter was achieved through three related projects: ASEAN ICT Skill Standards Definition and Certification, ASEAN ICT Skill Standards Definition and Certification (Phase II), and ASEAN ICT Skills Upgrading and Development.

AIM 2015 and the AEC Blueprint

As regards the AEC Blueprint, the AEC envisages the following key characteristics:

- (a) A single market and production base
- (b) A highly competitive economic region
- (c) A region of equitable economic development
- (d) A region fully integrated into the global economy

Each characteristic comprises its own elements. Having considered all of the characteristics and their respective elements, it can be seen that projects under the AIM 2015 were the driving force that pushed forward the realisation of ASEAN becoming a “competitive economic region”. Relevant elements are (b4) Infrastructure Development and (b6) E-Commerce.

Actions identified under Information Infrastructure Development and E-Commerce were addressed by AIM 2015 projects highlighted in Table 2 and Table 3 respectively.

Table 2

-

Contribution of the AIM 2015 to Infrastructure Development

Infrastructure Development	
Action	Addressed in the AIM 2015 by
Facilitate high-speed connection between all national information infrastructures and implement ICT measures as identified in the VAP.	This Action was addressed in the AIM 2015 by the following projects: <ul style="list-style-type: none">• ASEAN Broadband Corridor• Plan to Increase Capacity to Meet Data Demand in ASEAN for the Next 5 Years• Refarming of the 2G Frequency for the Mobile Broadband System• Study on Digital Dividend Spectrum Re-Allocation Approaches Towards Mobile Broadband Usage - Phase 2
Intensify capacity building and training programmes for national Computer Emergency Response Teams (CERTS) and strengthen their capacity and cooperation as well as the coverage of the regions' cyber-security network including the ASEAN CERT Incident Drills to include ASEAN's Dialogue Partners.	This Action was addressed in the AIM 2015 by the following projects: <ul style="list-style-type: none">• CERT/CIRT Readiness Assessment for CLMV (with ITU)• ASEAN Network Security Action Council Meetings• Public Private Partnership on Data Center Security
Encourage the participation of all stakeholders (people, communities, enterprises and public administrations) in the utilisation and development of ICT applications and services on the regional information infrastructure.	This Action was addressed in the AIM 2015 by the following project: <ul style="list-style-type: none">• ASEAN CIO Forum

Infrastructure Development	
Action	Addressed in the AIM 2015 by
Support sectoral ICT applications (initially in key sectors such as customs, logistics, transport, and content industries) to improve their effectiveness and productivity.	This Action was addressed in the AIM 2015 by the following projects: <ul style="list-style-type: none">• ASEAN e-Government Strategic Action Plan• ASEAN e-Services Identification• Stocktaking among AMS for Database Development of Smart ICT Applications & Services towards e-Society
Expand the number of ASEAN countries participating in the ASEAN MRA for telecommunications equipment.	This Action was addressed in the AIM 2015 by the following projects: <ul style="list-style-type: none">• Enhancing the Implementation of MRAs• Survey of Existing ICT Standards on ICT Products and Services in ASEAN with a Pilot Study on Common Software Development Standard
Deepen the regional policy and regulatory framework to deal with the opportunities and challenges in the area of Next Generation Networks, including the interoperability of products/ services, information systems and networks in the convergent environment.	This Action was addressed in the AIM 2015 by the following projects: <ul style="list-style-type: none">• The Study of Legal,Regulatory Issues and Operational Experiences from ASEAN Member States' Telecommunications Regulators of the CLM Countries• IPv6 Collaborations in ASEAN 2012• Promote and Encourage the Deployment of IPv6 for Small and Medium Enterprises (SMEs)• Guidelines of OTT Management Policy for AMS• Spectrum Regulatory Approach for TV White Space Devices

Table 3

-

Contribution of the AIM 2015 to E-Commerce

E-Commerce	
Action	Addressed in the AIM 2015 by
Adopt best practices in implementing telecommunications competition policies and fostering the preparation of domestic legislation on e-commerce.	This Action was addressed in the AIM 2015 by the following project: <ul style="list-style-type: none">• Intra-ASEAN Secure Transactions Framework
Harmonise the legal infrastructure for electronic contracting and dispute resolution.	
Develop and implement better practice guidelines for electronic contracting, guiding principles for online dispute resolution services, and a mutual recognition framework for digital signatures in ASEAN.	This Action was addressed in the AIM 2015 by the following projects: <ul style="list-style-type: none">• Intra-ASEAN Secure Transactions Framework• Intra-ASEAN Secure Transactions Framework Implementation Workshop
Facilitate mutual recognition of digital signatures in ASEAN.	
Study and encourage the adoption of the best practices and guidelines of regulations and/or standards based on a common framework.	This Action was addressed in the AIM 2015 by the following project: <ul style="list-style-type: none">• Intra-ASEAN Secure Transactions Framework

E-Commerce	
Action	Addressed in the AIM 2015 by
Establish a networking forum between businesses in ASEAN and its Dialogue Partners as a platform for promoting trade and investment.	This Action was addressed in the AIM 2015 by the following projects: <ul style="list-style-type: none">• ASEAN Digital Content Exchange• ASEAN CIO Forum

From the points discussed above, it is reasonable to conclude that the AIM 2015 has been successful. Not only has it been completed within the appropriate timeframe, but it has also played a vital role in enabling ASEAN to be a single community in which people are better connected to one another, goods and services flow more freely across nations, and infrastructure is delivered in a way that enables ICT to become a greater part of everyday life.



ANALYSIS OF RESOURCE ALLOCATION

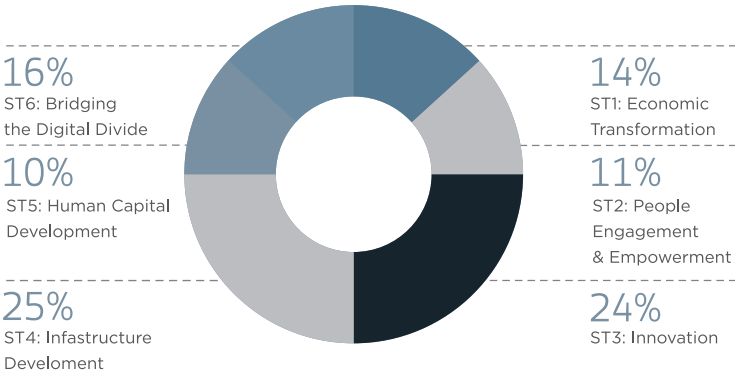
Under the AIM 2015, approximately 2.2 million USD was spent on 87 projects. Regarding the funding sources, 80.3% came from the ASEAN ICT Fund (AICTF), 10.3% were self-funded by individual countries, and 9.4% were funded by ASEAN dialogue partners. The 87 projects are listed in the Appendix.

Figure 2
–
AIM 2015 BUDGET ALLOCATION



In what follows, the allocation of resources for each Strategic Thrust is examined. This examination will be based on two accounts: budget approval and number of projects. The former will show whether the size of the budget allocated to each Strategic Thrust is approximately equal given the assumption that all Strategic Thrusts are of equal importance. The latter will show whether each Strategic Thrust received an appropriate amount of endeavour and intellectual resources, measured in terms of number of activities.

Figure 3
–
ALLOCATION OF APPROVED BUDGET BY STRATEGIC THRUST

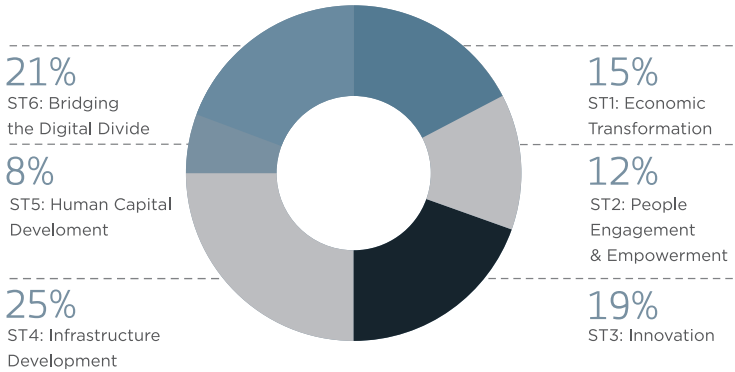


Resource allocation based on budget approval

If all six Strategic Thrusts were of equal importance, each should have received monetary resources equal to approximately 16.67% of the total budget (16.67% X 6 = 100%). However, as seen from Figure 3, the distribution of the total budget was far from equal. Strategic Thrust 5 (Human Capital Development) received only 10% of the total budget, while Strategic Thrust 4 (Infrastructure Development) received 25% and Strategic Thrust 3 (Innovation) received 24%.

This suggests that there is room for improvement among the AMS in terms of planning monetary resource allocation and/or prioritising Strategic Thrusts. This is not to say that all Strategic Thrusts must receive an equal share, but if the disparity in budget allocation existed only by coincidence, it indicates that the process of determining project approval in the AIM 2020 should take into consideration the amount of funding that has already been approved and planned to be spent on each Strategic Thrust.

Figure 4
–
ALLOCATION OF PROJECTS BY STRATEGIC THRUST



Resource allocation based on number of projects

Another indicator which shows how resources were spent is the number of projects dedicated to each Strategic Thrust. The result is in line with that of budget allocation and is shown in Figure 4

Strategic Thrust 4 (Infrastructure Development) was ranked 1st with the largest proportion of projects (25%). As was the case with budget allocation, Strategic Thrust 5 (Human Capital Development) also received the smallest allocation of projects (8%).

One important message worth pointing out is that more attention needs to be paid to human capital development. Only 10% of the entire budget and 8% of the total projects were dedicated to Strategic Thrust 5 (Human Capital). Since all ICT development is dependent on human capital, it is important to develop its human resources.



CASE STUDIES

The progress and achievements of the AIM 2015 were driven by successes at the project level. In this section, certain projects under the AIM 2015 are presented in order to illustrate what has been done and what the results have been under each Strategic Thrust. Such projects are considered to be case studies because they have met the objectives of their associated Initiative and Action Point and have created, or are expected to create, significant impacts on ICT development in ASEAN.

This is by no means to say that they are more successful or more important than other projects. The intention of this section is only to illustrate what specifically has been carried out.

Strategic Thrust 1

-

Public-Private Partnership (PPP) Models for ICT

A Public-Private Partnership (PPP) is, in simple terms, a range of formats of business cooperation between government and private sectors that allow both parties an opportunity to accomplish their objectives. For public sector entities, their goals are simple: to maximise the social benefits for the people which that public organisation serves. In this setting, the PPP model gives them access to the private sector’s innovative power to provide services and their ability to maximise resource utilisation. For private sector organisations, the PPP model allows them to tap into areas of business usually performed by public agencies, which, in turn, grants them access to a mass base of clients or users.

This project studied cases of successful PPP ventures in ICT and non-ICT industries in ASEAN and other countries. The objective was to share examples on how to engage domestic businesses using the PPP model, in order to develop ICT infrastructures and other forms of information and communication technology in their country.

The project studied the PPP models in Malaysia, Singapore and Thailand. It was concluded that there were similarities in the three countries. Many of the ICT infrastructures were built through some form of public-private sector cooperation. For example, Malaysia rolled out its high-speed nationwide broadband network through a joint investment between the government and the private sector. Singapore created a network of free public WiFi by working with three different private operators to provide hotspots throughout Singapore. Thailand utilised a Build-Transfer-Operate model of PPP to expand its fixed line telephone service subscriptions, using a system of concession fees to share revenue with its private sector partner.

The study yielded the following conclusions:

- The formats of the PPP model that best fit each nation differ from country to country. Also, the nature of each service affects the type of PPP partnership structures that should be utilised.
- The PPP model offers a win-win solution for both the public and private sector.
- Clarity of services to be provided, good planning and accountability are the keys to the viability and effectiveness of the partnership.

- The AMS should share their information and experiences from their domestic PPP model to help other members develop their own policies and frameworks for their domestic PPP model.

Guidelines of OTT Management Policy for AMS

In general, “Over-the-Top” means the delivery of services or content such as messaging services and audio or video content which is not under the administrative control of the content or service providers. This industry is new and operates at the top of the global internet infrastructure. Key players in this growing industry include the regionally known LINE messaging application, as well as internationally known communication applications such as Whatsapp or Skype.

With the arrival and spread of mobile internet across the region, there has been a growth in the introduction of new trends. In light of this, regulators and policymakers in ASEAN are faced with new challenges on how to design appropriate regulations to govern newly emerging businesses in the ICT industry.

This project’s aims are to provide policymakers with key information on how they should regulate this industry, and to make recommendations to service operators in the industry on how they should standardise their services across a range of businesses. The project was concluded with a workshop in Da Nang, Viet Nam, in 2014.

Figure 5

Picture from the ASEAN Workshop on the Guidelines of OTT Management Policy for ASEAN Member Countries



The project yielded the following conclusions:

- The study confirms that OTT service development is following an upward trend.
- This trend represents both an opportunity and challenges for service providers on how to match their services with the rapidly changing trend. The study placed emphasis on service security and the quality of services.
- OTT providers and telecom operators should work together to offer modern and convenient services to users. In particular, telecom operators should offer service packages that are suitable to different types of users.
- International/regional cooperation on policies, regulations and guidelines plays an important role in the competitiveness and sustainable development of the telecommunication market. Information safety, security and privacy should be the important concerns of policymakers.

Strategic Thrust 2

ASEAN e-Services Identification

A survey to gain better understanding of ASEAN-wide e-Services requirements was conducted under the “ASEAN e-Services Identification” project. Initiated during the last quarter of 2013 and concluded in July 2014, the survey focused on various aspects including: (1) current status of the deployment of e-Services; (2) planned deployment of e-Services; (3) requirements from users; and (4) requirements from major business sectors. Over 900 individuals participated in this survey, including general e-Service users, business users, representatives of organisations, and focal points of ASEAN countries.

Fundamentally, the project studied the overall development of government e-Services in ASEAN, covering the aspects of citizen demand and business demand.

The project yielded the following key findings:

- Of all sectors of interest, e-Services related to commerce are most widely used in ASEAN.
- As for government e-Services, there exist gaps among ASEAN countries, both in terms of availability and stage of development.
- Individual users and business users have different requirements. The former is concerned with the ease of use and reliability of e-Services while the latter focuses more on responsiveness from website staff and website design.
- E-Services related to (1) government services, (2) health and (3) education are considered to be relevant and important to ASEAN as both intra-state and inter-state services.
- Infrastructure, especially a reliable internet network, is a key foundation for e-Service development in ASEAN.

The project was concluded in July 2014 with a workshop in Bangkok, Thailand, as pictured in Figure 6.

The results obtained from this study are instrumental in identifying appropriate measures to develop intra-state and inter-state e-Services in ASEAN. It is hoped that, with the requirements from individual users and business sectors being met, the use of e-Services will be more widespread in the AMS and this will bring about a better quality of life for ordinary citizens.

Figure 6

Picture from the Workshop on ASEAN e-Services Identification



Enhancing the Implementation of MRA in the ASEAN Region

This project aimed to identify the barriers and challenges encountered by the AMS in the implementation of the existing MRA for conformity assessment (MRA CA). It also intended to address the issues and brainstorm possible channels through which the AMS can be assisted to participate in the MRA.

To this end, questionnaires were sent out to gather information, and a workshop was also organised on 21 August 2014 in Yogyakarta, Indonesia. It was found in this project that the challenges and obstacles to implementing the MRA included the absence of a conforming assessment infrastructure (testing laboratory), inadequate support and demand from the private sector, and the lack of authority and legislative power.

Recommendations drawn from the questionnaires and the conclusion of the workshop include the following.

- ATRC is expected to be able to facilitate by channel, the guidelines / procedures on joining the MRA.
- On MRA SE, ATRC should have one standard for the AMS.
- The AMS may adopt standards produced by international standardisation bodies due to the fact that some countries lack conformity assessment infrastructure and have legal difficulties

Figure 7

Picture from the ASEAN Workshop on Enhancing the Implementation of MRA





Strategic Thrust 3

ASEAN ICT Awards

The ASEAN ICT Awards (AICTA) was established in 2012 as a competition designed to recognise the most innovative ICT products and services amongst the AMS. After the first AICTA was held during the 12th TELMIN in Cebu, the Philippines, TELMIN agreed that the competition would be held annually.

The ASEAN community developed these awards with the aim of encouraging innovation, which is the strategic focus of the AIM 2015. Its objectives are to: (1) develop the ASEAN ICT Awards to promote creativity and encourage innovation; (2) provide incentives for R&D efforts by acknowledging, recognising and rewarding ICT innovators; and (3) recognise organisations that have the most appropriate advancement in the adoption of ICT.

The AICTA recognises the current trends and growth potential of ICT products and services in the AMS. In the inaugural event, there were five categories of Awards:

- Public sector
- Private sector
- Digital content
- Corporate social responsibility
- Start-up

The AICTA subsequently added “Research and Development” as a new category for later competitions.

It was agreed during the Special TELSOM held in Phnom Penh, Cambodia, on 28 and 29 May 2014 that the host country of TELMIN each year would organise the AICTA for that year, utilising an annually recurring budget supported by the AICTF.

Therefore, as Viet Nam is the host of TELMIN in 2015, Viet Nam will take over the role from Brunei Darussalam of organising AICTA 2015.

Below are statistical information on AICTA during 2012 - 2014

Number of Nominations

ASEAN Member States	2012	2013	2014
Brunei Darussalam	2	2	1
Cambodia	1	0	9
Indonesia	13	16	18
Lao PDR	2	3	1
Malaysia	12	16	6
Myanmar	8	8	4
Philippines	9	5	7
Singapore	12	17	11
Thailand	11	17	16
Viet Nam	2	0	5
Total	72	84	78

Number of AICTA Finalists

ASEAN Member States	2012	2013	2014
Brunei Darussalam	0	1	0
Cambodia	0	0	1
Indonesia	3	3	1
Lao PDR	1	1	0
Malaysia	3	2	1
Myanmar	1	0	1
Philippines	0	0	1
Singapore	5	8	2
Thailand	0	3	0
Viet Nam	2	0	1
Total	15	18*	18*

(*Research & Development was introduced in 2013 as a new category in AICTA)

Number of Winners as per AMS

ASEAN Member States	1st Place	2nd Place	3rd Place
Brunei Darussalam	-	-	1
Cambodia	1	-	-
Indonesia	2	3	2
Lao PDR	1	-	1
Malaysia	3	2	1
Myanmar	2	-	-
Philippines	1	-	-
Singapore	4	6	5
Thailand	2	3	8
Viet Nam	1	2	-

(For more details, please visit AICTA webstie at <http://www.aseanictaward.com>)

ASEAN CIO FORUM

The ASEAN CIO Forum (ACIO) is an annual event aimed at providing a stage for the promotion of innovation and collaboration amongst government, business, public and other institutions to create a platform for the exchange of best practices between CIOs across ASEAN, and to provide an opportunity for networking and relationship building amongst ICT players in ASEAN.

The 3rd Forum, held in Sepang, Malaysia, during 17-19 August 2014, is of particular importance because it introduced the establishment of the ASEAN CIO Association (ACIOA), which not only represents a cooperation among the AMS but also extends to form partnerships with countries from other regions including Korea, Japan, India, China, the USA and countries in the Middle East. Topics expected to be discussed in the ACIOA include:

- CIO’s readiness to think about the internet of things, particularly on how to serve their customers
- The use of public-private partnership (PPP) to build ASEAN Centres of Excellence

- Digital transformation to a digital economy, the role of government in engaging their citizens to optimise the demand for and retention of special skills within their country
- Smart ASEAN, Smart Cities.

Figure 8 displays a picture from the 3rd ASEAN CIO Forum.

The latest Forum (4th ACIO) was held in Brunei Darussalam during 8-9 June 2015 under the theme of “Global Competitiveness – Optimising Technological Advances”. It was attended by 32 participants.

Figure 8
-
**PICTURE FROM THE 3rd
ASEAN CIO FORUM**



Strategic Thrust 4

ASEAN Broadband Corridor¹

In order to reap the full benefits of ICT, access to broadband services is crucial. To this end, the ASEAN Broadband Corridor project aimed to speed up broadband deployment in ASEAN.

The study revealed that the AMS could be classified into three categories with differing levels of internet access and affordability: (1) high affordability and access (Brunei Darussalam, Malaysia, and Singapore); (2) increasing affordability and access (Indonesia, Philippines, Thailand, and Viet Nam); and (3) high opportunity for development (Cambodia, Lao PDR, and Myanmar)

Differences in a number of key attributes distinguish each country group. Group 1 comprised countries with a high urban population and affordable broadband access. Countries in Group 2 enjoy relatively affordable broadband prices in their urban centres, and exhibit significant growth in broadband adoption. Group 3 countries have the most opportunities for development, as they have low populations in their urban centres and higher broadband prices. Group 3 countries also have the potential to leapfrog the wired revolution completely, as they have a faster mobile than fixed broadband adoption rate.

Based on the existing state of broadband development of each AMS, this project crafted customised recommendations for each of the three groups, focusing on a specific goal, such as broadband penetration, affordability or universal access – focusing on the most pertinent for improving their current situation. Key drivers and initiatives targeting the policy and regulatory environment were also developed to assist each group.

The study’s findings and recommendations were endorsed in March 2013. With its endorsement, the AMS agreed to consider adopting or modifying the recommendations for implementation.

¹ The content regarding this project is mostly replicated from the ASEAN ICT Masterplan 2015 Mid-term Review with slight modifications.

Strategic Thrust 5

ASEAN ICT Skill Standards Definition and Certification (Phase I and Phase II)

In order to develop human capital and enable the free flow of skilled labour across ASEAN, ICT industries must agree on ASEAN-wide skills standards. In support of the AIM 2015’s Strategic Thrust to develop capacity, the ASEAN ICT Skill Standards Definition and Certification project was initiated.

The two main objectives of this project were to develop: (1) standard definitions and certifications for areas of ICT skills and (2) related certifications to be used by the AMS. The ultimate goal of this project is to create a standardised system of skill and certification matching and comparison, which would provide businesses across ASEAN with more information on the employment of non-nationals, thus facilitating integration into the AEC and maximising its advantages.


The results of the project are the development of standard definitions for seven ICT skills; the mapping of a table of ICT skill standards, which allows different standards in ASEAN and others to be compared; and the introduction of a certification process. The seven skills covered in the project are:

- Software development
- ICT project management
- Enterprise architect design
- Network and system administration
- Information system and network security
- Cloud computing
- Mobile computing

An example of “Mapping Table” developed in this project is shown in Table 4.

Table 4

Mapping Table of Competency Level

Competency Level	Basic Level	Intermediate Level	Advanced Level
 ASEAN	Has basic knowledge and skill which is adequate to perform a given task(s) under supervision of management	Has professional knowledge and skills to perform a given task(s) independently, and, if required, can supervise others; understand a number of comparative approaches to problems in their fields; and be able to apply them efficiently	Has professional knowledge and skills in both technical and management to lead a team in inexperienced environment
 Indonesia	Level 1-3	Level 4-6	Level 7-9
 Malaysia	Level 2	Level 3	Level 4
 Myanmar	Level 2	Level 3	Level 4
 Philippines	Level 1	Level 2	Level 3
 Singapore	Level 1	Level 2	Level 3
 Thailand	Level 3	Level 4	Level 5
 Viet Nam	Level 2	Level 3	Level 4

Source: ASEAN ICT Skill Standards Definition and Certification

It should be noted that, with a small adjustment to the direction of the project due to constraints within the domain, the project ended with an agreement on having an “accreditation process” rather than a full certification process. As a conclusion to the first phase of the project, a workshop was held in Bangkok, Thailand, in January 2013. In the second phase of the project, the focus of the study was on how the accreditation process should be conducted. A workshop for the second phase was held in Bangkok, Thailand in October 2014. Figure 9 displays a picture from the project’s second-phase workshop.

Figure 9

Picture from the Workshop on ASEAN ICT Skill Standards Definition and Certification Phase II



Strategic Thrust 6

ASEAN Cyberkids Camp²

The ASEAN Cyberkids Camp (ACC) is an initiative started in 2008 to promote joint collaboration activities to raise the awareness of innovation and communication technologies among school children. The programme seeks to promote the development of ICT awareness and skills among the young participants from the AMS, who come from culturally and economically diverse backgrounds. It also aims to narrow the gap between those with more ICT skills and those with less through technology transfer and capacity building.

² The content regarding this project is mostly replicated from the ASEAN ICT Masterplan 2015 Mid-term Review with slight modification and update.

The inaugural ASEAN Cyberkids Camp was held in Kuala Lumpur, Malaysia, in November 2008, when Malaysia hosted 120 school children representatives from ASEAN countries. The camp was well-received by all involved and, until 2013, Malaysia played gracious host to the Camp and its activities, hosting 107 children in 2009, 93 children in 2010, 76 children in 2012, and 31 children in 2013.

The most recent ASEAN Cyberkids Camp was held in Bandung, Indonesia, during 8-10 June 2015 with the participation of 16 primary-school-aged children from eight of the 10 AMS. Participating countries included Cambodia, Indonesia, the Lao PDR, Malaysia, Myanmar, the Philippines, Thailand and Viet Nam. The programme adopted 21st century learning objectives by developing computer animations, interactive stories, and applications.

A picture from the ASEAN Cyberkids Camp 2015 is shown in Figure 10.

Figure 10

Picture from the ASEAN Cyberkids Camp 2015



Collaboration with the International Conference on Teaching and Learning with Technology (iCTLT)

This project was part of Initiative 6.2 “Connect schools and advocate early ICT education” and addressed the “Collaborate between ICT and education sectors within ASEAN” Action Point.

The aims of this project were (1) to allow participants to gain deeper understanding of the usage of ICT in education and (2) to share best practices on teaching and learning with technology. In essence, the project was intended to intensify the application of new technology in education across ASEAN, and to equip ASEAN policymakers and educators with the right tools and skills they need to assess their domestic situation in order to optimise the planning of ICT integration into the educational sector.

The project was implemented through a workshop and ICT conference that were held from 7-10 April 2014 in Singapore. Participants in the workshop agreed that the integration of ICT into an education system was crucial for the development of that education system, notwithstanding the fact that there was no one-size-fits-all model for all ASEAN Member States. It was also noted that the key challenges to further educational development in ASEAN were the lack of connectivity in rural schools, financial constraints, and the need to change teachers’ mind-sets.

Figure 11 displays a picture of the ASEAN Workshop on Teaching and Learning with Technology

Figure 11

Picture from the ASEAN Workshop on Teaching and Learning with Technology





ICT DEVELOPMENT IN ASEAN

To assess the development under each Strategic Thrust, key performance indicators (KPIs) were suggested in the Mid-term Review. Some of these are compiled and publicised on a regular basis by international organisations such as the World Bank, the International Telecommunications Union (ITU), the United Nations, and the World Economic Forum. Some others, however, are not made publicly available. This creates difficulty in tracking the progress of AIM 2015 and/or performing cross-country comparisons.

Hence, instead of showing all relevant KPIs, this section selects a number of KPIs that are available for most, if not all, of the AMS and, in cases where data are not available, selects alternative indicators to show how the endeavours associated with each Thrust have moved development forward in ASEAN³.

³ The data presented in this section were up to date as of September 2015. In cases where no data were publicly available as of September 2015, N/A is indicated.

Strategic Thrust 1

Economic Transformation

As economies advance, the service sector plays a bigger role as an engine of growth. In ASEAN, a region in which the degree of openness to trade is high and GDP is driven significantly by exports, ICT service exports are by all means an important contributor to the regional economy. The ICT services, in relation to all services exports, have gradually increased and this indicates that the AMS have been in transition to become more technologically and digitally driven.

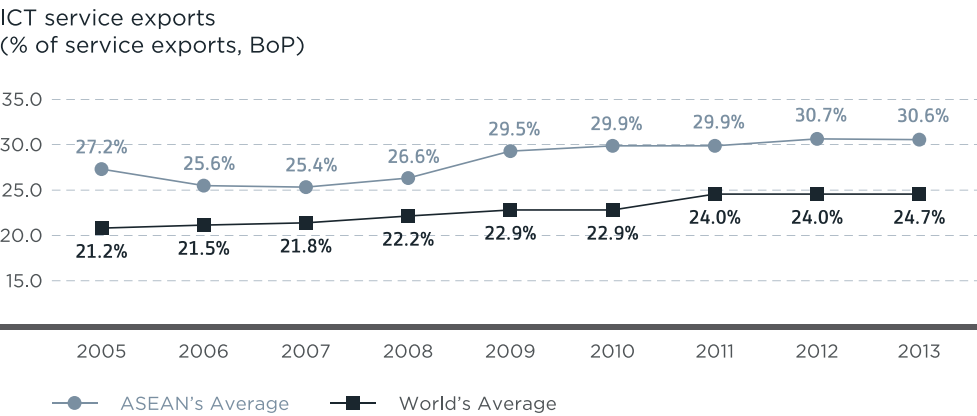
World Development Indicators, published annually by the World Bank, compile and disseminate data on ICT service exports as a percentage of total service exports for countries around the world including six AMS, which are Cambodia, Indonesia, Malaysia, the Philippines, Thailand, and Singapore. Over the past decade, the average of these six AMS has increased slowly but continuously. As seen in Figure 12, the ASEAN average is also higher than that of the world.⁴

⁴ Throughout this section, ASEAN averages are calculated as simple averages of numbers for the AMS whose data were available. World averages are also computed in the same manner.

Figure 12

ICT Services Exports as Percentage of Total Service Exports

Country	Number of Exports (% of Service Exports, Bop)				
Year	2010	2011	2012	2013	2014
Cambodia	5.779	6.361	6.711	8.44	N/A
Indonesia	32.629	34.088	38.231	33.5	N/A
Malaysia	21.832	24.660	27.856	29.1	N/A
Philippines	74.921	73.532	70.006	70.9	71.5
Singapore	22.895	23.346	24.760	27.1	27.1
Thailand	20.548	17.147	16.190	14.6	17.4



Source: World Development Indicators (published by the World Bank) and authors' calculation

In 2009, the ratio of ICT service exports to all service exports for ASEAN was 29.5% whereas that for the world was 22.9%. In 2013, the ratio for ASEAN stood at 30.6% while the world average was 24.7%.

At the individual country level, the percentage of ICT exports is exceptionally high in the Philippines. The figure was over 70% for many consecutive years. In Cambodia, while the number is still small, the rise is proportionally high. The Cambodian figure in 2010 was 5.78% while the percentage for 2013 was 8.44%.

Strategic Thrust 2

People Engagement and Empowerment

The extent to which people are encouraged to use and empowered by ICT can be measured by the affordability of ICT products and services such as the cost of accessing the internet and mobile-phone services. Falling costs would enable more people to be connected to the digital world and to one another, and consequently enhance their quality of life in many respects.

The indicators compiled and published by the International Telecommunication Union (ITU) are relevant. These are a fixed-broadband sub-basket as a % of GNI (Gross National Income) per capita and a mobile cellular sub-basket as a % of GNI per capita.

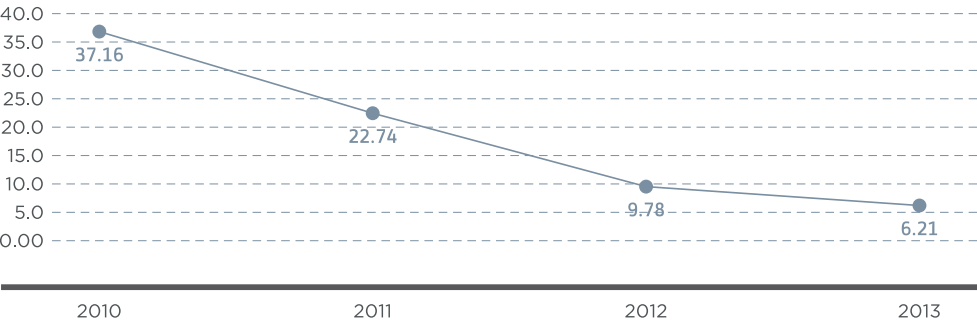
As for the former, the calculation is based on a minimum speed of 256 kbit/s with a monthly usage of (a minimum of) a Gigabyte (GB). The ASEAN average of nine countries whose data are available from the ITU shows that the cost of accessing fixed-broadband has decreased dramatically over the past few years. As depicted in Figure 13, it went down from 37.16% in 2010 to 6.21% in 2013.

Figure 13

Fixed-broadband Sub-basket as % of GNI per Capita

Country	Fixed-Broadband Sub-Basket as Percentage of GNI per Capita				
Year	2010	2011	2012	2013	2014
Brunei Darussalam	2.3	1.8	1.9	1.9	N/A
Cambodia	92.5	48	34	15.0	N/A
Indonesia	16	10.4	9.1	6.9	N/A
Lao PDR	190.5	111	-	13.7	N/A
Malaysia	3.3	3.2	3.1	2.4	N/A
Philippines	12.8	12.9	12.4	8.6	N/A
Singapore	0.9	0.8	0.8	0.4	N/A
Thailand	6	5.8	5.6	5.0	N/A
Viet Nam	13.5	10.8	11.3	2.0	N/A

ASEAN's Average Fixed-boardband Sub-basket as % of GNI Capita



Source: International Telecommunications Union (ITU) and authors' calculation

Looking at individual countries, strong improvement has been witnessed in several nations. For example, the number for Viet Nam fell from 13.5% in 2010 to 2.0% in 2013. Over the same period, the figure for Cambodia fell from 92.5% to 15.0%.

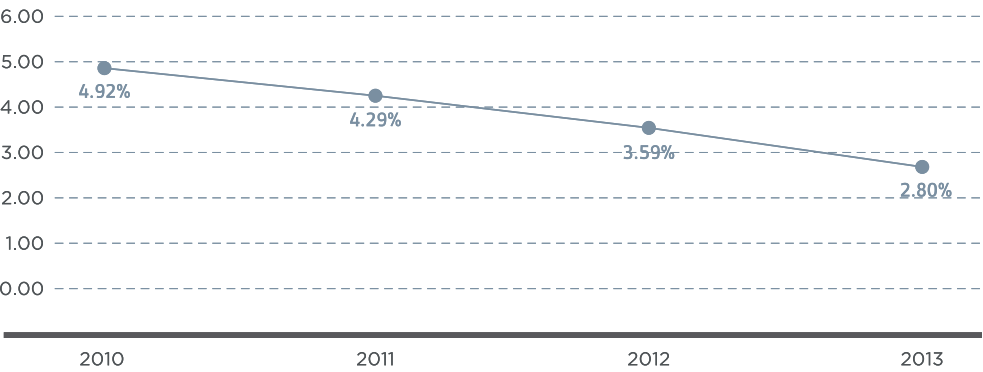
ASEAN citizens can also connect better to one another as a result of the decrease in the cost of using mobile cellular. The mobile-cellular sub-basket, an ICT indicator which measures this and is made available by the ITU, refers to the price of a standard basket of mobile monthly usage for 300 outgoing calls per month (on-net, off-net for a fixed line and for peak and off-peak times) in predetermined ratios, plus 100 SMS messages.

Figure 14

Mobile Cellular Sub-basket as % of GNI per Capita

Country	Mobile Cellular Sub-Basket as Percentage of GNI per Capital				
Year	2010	2011	2012	2013	2014
Brunei Darussalam	0.7	0.7	0.8	0.7	N/A
Cambodia	13.2	12.1	10.8	7.9	N/A
Indonesia	4.6	3.9	3.2	2.3	N/A
Lao PDR	8.6	7	-	5.9	N/A
Malaysia	1.2	1.4	1.1	0.8	N/A
Philippines	5.9	5.9	5.7	3.7	N/A
Singapore	0.3	0.2	0.3	0.2	N/A
Thailand	2.8	2.5	2.9	1.2	N/A
Viet Nam	7	4.9	3.9	2.5	N/A

ASEAN’s Average Mobile Cellular Sub-basket as % of GNI Capita



Source: International Telecommunications Union (ITU) and authors’ calculation

Figure 14 shows that the ASEAN average of the mobile-cellular sub-basket as a % of GNI per capita was 2.80% in 2013. This fell from 4.92% in 2010. The indicator for countries with a relatively high level of ICT development such as Brunei Darussalam and Singapore remained rather constant but the indicator for other AMS saw a significant decline. The number for Cambodia, for instance, went from 13.2% in 2010 to 7.9% in 2013. For Lao PDR, the number fell from 8.6% to 5.9% over the same period.

Strategic Thrust 3

Innovation

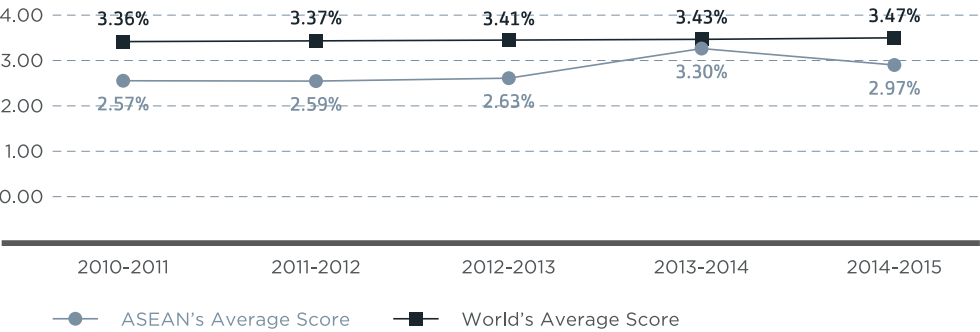
Measuring ICT innovation is not straightforward. However, a look at a pillar of the Global Competitiveness Index, namely “Innovation”, reveals a positive sign nonetheless. As seen from Figure 15, the ASEAN average showed an upward trend during 2011-2015. The score was 2.57 in 2011 and it increased to 2.97 in 2015. In addition, the gap between the ASEAN average and the world average has become narrower. This can be interpreted as an improvement in innovation within ASEAN as a whole.

Figure 15

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12th Pillar of Global Competitiveness Index (Innovation)

Country	The Global Competitiveness Index, 12th Pillar: Innovation				
Year	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015
Brunei Darussalam	3.1	3.2	3.3	3.4	-
Cambodia	2.7	3.0	3.2	3.0	2.8
Indonesia	3.7	3.6	3.6	3.8	3.9
Lao PDR	-	-	-	3.2	3.1
Malaysia	4.1	4.3	4.4	4.4	4.7
Myanmar	-	-	-	2.2	2.3
Philippines	2.7	2.8	3.0	3.2	3.5
Singapore	5.0	5.3	5.4	5.2	5.2
Thailand	3.3	3.3	3.2	3.2	3.3
Viet Nam	3.4	3.2	3.1	3.1	3.1
ASEAN's Average	2.57	2.59	2.63	3.30	2.97
World's Average	3.36	3.37	3.41	3.43	3.47

Global Competitiveness Index: Innovation



Source: Global Competitiveness Index (published by the World Economic Forum) and authors' calculation

Despite such improvements, it is worth emphasising that this pillar of Global Competitiveness Index also covers innovations other than those in the field of ICT. Therefore, it cannot be concluded with any degree of certainty that the enhancement of innovation in the AMS is wholly or mainly driven by ICT innovation. As a result, the AMS should therefore publicise information on patent applications and/or approvals categorised by sectors so that every country can measure and track its development in ICT innovation in a straightforward and more accurate manner.

Strategic Thrust 4

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Infrastructure Development

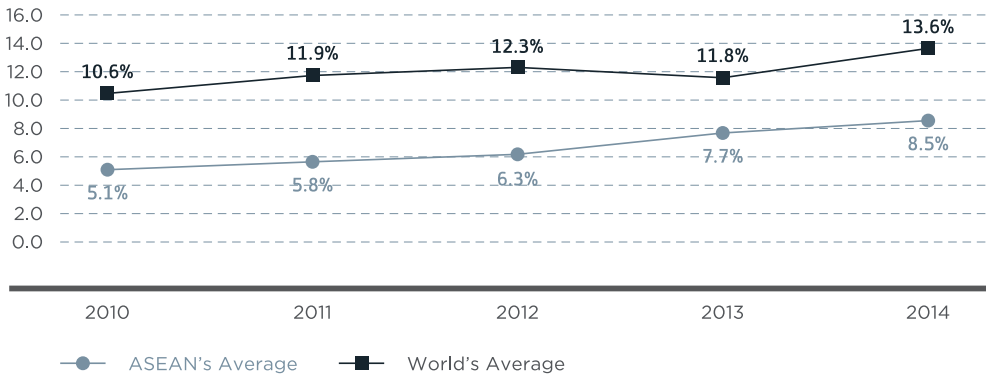
The evidence of infrastructure development in ASEAN is strong. Statistics show that, over the past five years, the proportion of ASEAN citizens with access to broadband internet and mobile phone services has increased significantly. This is particularly so in certain countries with initially low levels of accessibility just a few years back. To illustrate this, one may look at broadband subscriptions per 100 population. This indicator was proposed as a KPI for Strategic Thrust 4 in the Mid-term Review.

Figure 16

Broadband Subscriptions per 100 Population

Country	Broadband Subscription per 100 Population				
Year	2010	2011	2012	2013	2014
Brunei Darussalam	5.42	5.70	4.81	6.60	7.15
Cambodia	0.25	0.15	0.20	0.22	0.20
Indonesia	0.95	1.12	1.21	1.30	1.19
Lao PDR	0.09	0.10	0.11	0.13	0.16
Malaysia	7.42	8.72	9.99	9.89	10.14
Myanmar	0.04	0.04	0.12	0.18	0.26
Philippines	1.84	5.37	7.89	18.17	23.22
Singapore	26.35	27.12	27.02	27.60	27.79
Thailand	4.90	5.85	6.77	7.75	8.21
Viet Nam	4.12	4.27	4.90	5.62	6.48
ASEAN's Average	5.14	5.84	6.30	7.74	8.48
World's Average	10.61	11.89	12.30	11.79	13.64

Average Boardband Subscriptions per 100 Population



Source: International Telecommunications Union (ITU) and authors' calculation

The data compiled from the ITU and shown in Figure 16 above indicate that broadband subscriptions per 100 population have increased almost consistently in every country during 2010-2014, although the magnitude differs across countries. The increase in Singapore’s number (from 26.35 in 2010 to 27.79 in 2014) is proportionally small and this is because Singapore started off with an already high number. Myanmar, on the other hand, witnessed a dramatic rise in broadband subscriptions from 0.04 in 2010 to 0.26 in 2014. Despite Myanmar’s current low rate, the rate of improvement has been rapid. Overall, the ASEAN average rose from 5.14 to 8.48 over the same period.

Another indicator, mobile subscriptions per 100 population, reveals a similar pattern. The ASEAN average rose from 90.43 in 2010 to 121.75 in 2014.

Figure 17

Mobile Subscriptions per 100 Population

Country	Mobile Subscriptions per 100 Population				
Year	2010	2011	2012	2013	2014
Brunei Darussalam	108.62	109.02	113.95	112.21	110.6
Cambodia	56.74	94.19	128.53	133.89	155.11
Indonesia	87.79	102.46	114.22	121.54	126.18
Lao PDR	62.59	84.05	64.70	66.20	66.99
Malaysia	119.74	127.48	141.33	144.69	148.83
Myanmar	1.14	2.38	7.06	12.83	49.47
Philippines	88.98	99.09	105.45	104.50	111.22
Singapore	145.40	150.12	152.13	155.60	158.13
Thailand	108.02	116.33	127.29	137.98	144.44
Viet Nam	125.29	141.60	147.66	130.89	147.11
ASEAN's Average	90.43	102.67	109.97	113.26	121.75
World's Average	89.6	95.4	99.8	103.8	105.6

Average Mobile Subscriptions per 100 Population



Source: International Telecommunications Union (ITU) and authors' calculation

As seen from figure 17, the ASEAN average is greater than the world average and the widening gap reflects the fact that accessibility to mobile phone services in ASEAN has increased faster than in the world as a whole. The development in this regard is particularly impressive in Myanmar whose number for 2014 is 49.47, a steep rise from 1.14 in 2010.

Strategic Thrust 5

Human Capital Development

One way to understand whether the AMS have developed competent and skilled human capital in ICT is to look at the “number of employed ICT professionals” as proposed in the Mid-term Review. Since the data on this indicator are not collected and publicised by international organisations, related information has therefore been collected from various national sources.

The numbers for countries whose data are available are presented in Table 5.

Table 5
Number of Employed ICT Professionals

Country	2010	2011	2012	2013
Indonesia	5,489,719	5,085,220	5,066,610	5,096,987
Malaysia	178,900	207,600	209,200	191,300
Singapore	141,300	142,900	144,300	146,700
Thailand	76,200	181,400	213,500	199,200
Viet Nam	32,600	150,500	162,600	144,200

Source: Compiled from various sources

It is worth noting that there is a limitation for comparing data across countries because the definition of the number of employed ICT professionals and method of calculation may differ from one country to another. For example, in Singapore, the term “employed ICT professionals” refers to people who work in telecommunications, broadcasting and publishing, and ICT and other information services, while “ICT professionals” in Indonesia is defined as people who work in the industry of transportation, storage, and communications.

Despite this, one message is clear. There is an upward trend in the number of employed ICT professionals in the AMS to support the transformation of ASEAN into a digitally driven region.

Strategic Thrust 6

-

Bridging the Digital Divide

Although time series data long enough to track the degree to which the digital divide between the AMS has been bridged are lacking, there is evidence which indicates that there is greater adoption of ICT, as hoped for in the objectives of Strategic Thrust 6.

“Percentage of public schools with broadband access” was proposed in the Mid-term Review as a KPI for this Thrust. However, due to the unavailability of the necessary data, a similar indicator called “Education institutions (public) with fixed broadband to internet access” disseminated by the UNESCO Institute of Statistics is considered instead. However, this indicator is available only for certain ASEAN countries and for the year 2012 only.

For countries whose data is available, the relevant information is as follows:

- Cambodia (1%)
- Malaysia (90%)
- Philippines (3%)
- Singapore (100%)
- Thailand (100%)

Given the limitation of the data, another alternative can be taken from the Global Information Technology Report of the World Economic Forum. This indicator is “Internet access in school”. For this indicator, data are drawn from questionnaires about the level of internet access in the schools of each country. The question used in the survey to quantify this indicator is “In your country, how widespread is Internet access in school? (ranging from 1 = non-existent to 7 = extremely widespread)”.

The level of Internet access in schools for years 2011-2013 are displayed in Table 6.

Table 6

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Internet Access in Schools

Country	2011	2012	2013
Brunei Darussalam	5.1	5.3	5.5
Cambodia	3.5	3.8	3.8
Indonesia	4.7	4.5	4.8
Lao PDR	-	-	3.9
Malaysia	5.2	5.1	5.2
Myanmar	-	-	2.2
Philippines	4.0	4.1	4.2
Singapore	6.3	6.3	6.3
Thailand	4.5	4.3	4.4
Viet Nam	4.9	5.0	5.1

Source: Global Information Technology Report (published by the World Economic Forum) and author’s calculation

Although the results in the table above are derived from the perceptions of respondents in the survey, it can be viewed as a reasonable indicator which suggests that access to internet in schools has been improving in several countries, albeit not at a substantial rate, and it is a sign that the gap within the digital divide will be gradually narrowed over time.



CONCLUSION

The AIM 2015 has been successfully completed. With its 29 Actions having been addressed by 87 projects, it is fair to say that the AMS have put tremendous efforts into enhancing ICT development in ASEAN and to utilising ICT as a tool to enhance the quality of life for their citizens. Such collaborative endeavours have resulted in a wide range of achievements ranging from the completion of the AIM 2015 itself to the fulfilment of the greater goal of ASEAN becoming an integrated region and one community.

ASEAN at large benefits from the AIM 2015 as its two larger plans – (1) The Master Plan of ASEAN Connectivity and (2) The AEC Blueprint – have benefited significantly from the contributions of activities under the AIM 2015. As for the former plan, projects under the AIM 2015 even served two out of 15 prioritised projects of the Master Plan and such prioritised projects are to establish an ASEAN Broadband Corridor (ABC) and to develop ICT Skill Standards. At a broader level, the AIM 2015 has helped fulfil two parts of the Master Plan, i.e. Physical Connectivity and People-to-people Connectivity, with a large number of projects spread across various Initiatives. As for the AEC Blueprint, certain elements of the “competitive economic region” characteristic have been accomplished through AIM 2015 activities. The said elements are Infrastructure Development (sub-element: Information Infrastructure) and E-Commerce.

Notwithstanding the fact that the AIM 2015 has helped fulfil the larger objectives of ASEAN through its contribution to the abovementioned two regional plans, the achievement of the AIM 2015 itself can be seen through the ICT development related to each Strategic Thrust. Statistics can reveal the progress that the AMS have made during the period of the AIM 2015 and show whether the AIM 2015 has fulfilled its objectives. Indeed, it has.

Data compiled from various sources indicate that improvement in ICT-related matters is evident both at the regional and domestic levels. The following examples for each Strategic Thrust serve to illustrate this.

Strategic Thrust 1

-

Economic Transformation

ICT clearly acts as an engine that transforms the economy. This is reflected in the proportion of ICT service exports as a percentage of total service exports. The ASEAN average in 2013 was 30.6%, a significant figure and larger than the world average (24.7%). An upward trend has also been witnessed over the past few years.

Strategic Thrust 2

-

People Engagement and Empowerment

The quality of life of millions has been enhanced by more affordable ICT. The cost of accessing mobile cellular services has been falling. The ASEAN average of the mobile cellular sub-basket as a % of GNI per capita, an indicator developed by the ITU, fell to 2.8% in 2013 from 4.92% in 2010. In certain countries, the decrease in this cost is strong. Cambodia, for example, had a figure of 13.2% in 2010 but this fell to 7.9% in 2013.

Strategic Thrust 3

-

Innovation

Innovation in ASEAN is on the rise as reflected in the value of the “Innovation” pillar of the Global Competitiveness Index. The average score for ASEAN was 2.57 in 2011 and it increased to 2.97 in 2015.

Strategic Thrust 4

-

Infrastructure Development

ICT infrastructure has been developed to support the provision of services to ASEAN citizens. The improvement is apparent as many more people have access to internet nowadays. The data from the ITU reveals that the average broadband

subscriptions per 100 population in ASEAN grew from 5.1 in 2010 to 8.5 in 2014. In some countries, such as Myanmar, the absolute number is still small but the growth has been impressive.

Strategic Thrust 5

-

Human Capital Development

More ICT professionals have been developed to support the greater ICT sectors and help transform other sectors. This is seen through the increasing number of ICT professionals in most AMS.

Strategic Thrust 6

-

Bridging the Digital Divide

The gap of the digital divide has become narrower. One example to illustrate this is to measure access to internet in schools. An indicator compiled and disseminated by the World Economic Forum suggests that while access to the internet in schools for relatively advanced economies such as Singapore and Malaysia has remained stable, in countries with a lower level of economic development, there has been a tangible improvement. To be specific, the score for Singapore stayed at 6.3 in both 2010 and 2013, while in Malaysia, the score remained constant at 5.2 in both years. The score for Cambodia however increased from 3.5 to 3.8 over the same period.

Up to this point, it can be seen that the AIM 2015 has achieved success as it comes to an end. However, the AIM 2015 is intended to serve as a precursor to the even greater objective of a highly evolved ICT industry and ICT usage in ASEAN. Because the world of technological innovation is evolving at such a rapid pace, with new innovations being introduced on an almost daily basis, the AIM 2015 can therefore only lay a foundation on which the AMS can develop. On the road to the future, ICT development must be continuously pushed across different fields of ICT and across different nations and cultures.

Therefore, it is of interest to express third-party opinion regarding suggestions on the direction which ASEAN should take for the long-term development of ICT in each respective Action Point.

Policy suggestions on each Action Point are highlighted in Table 7.

Table 7

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Recommendations on ASEAN ICT Development by Action Point

Recommendations by Action Point

Strategic Thrust 1: Economic Transformation

Facilitate sharing and exchanging of business information amongst ASEAN countries	New projects should utilise data/information obtained from completed projects to facilitate better sharing and exchange of information. In addition, the ASEAN Secretariat may also make use of its existing website as a platform to display more indicators on business information amongst the AMS, on top of the macroeconomic data already published. A set of indicators and protocol for sharing and exchanging business information is therefore desirable.
Develop a framework to facilitate transparent and harmonised ICT regulations	Laws and regulations across the region may never be completely harmonised. Therefore, instead of attempting to achieve complete harmonisation, the AMS could divert their attention to attempts at regional standardisation, which reduces the commitments and obligations of the ASEAN nations.
Share various PPP models and practices amongst ASEAN countries to formulate PPP models for the implementation of ICT projects	It is recommended that ASEAN countries make efforts to initiate projects similar to “Replicating ASEAN Best Practices in ICT for Disaster Risk Management” or, in other words, projects that study best practices in ICT utilisation on other topics.

Strategic Thrust 2: People Engagement and Empowerment

Study to lower intra-ASEAN roaming charges	A primary focus for the continuation of this Action-Point would be to encourage negotiations on bilateral agreements between ASEAN countries to lower roaming charges, as a follow-up to the Record of Intent signed by the AMS in 2011. Additional study on the roaming costs of each ASEAN mobile services provider should be conducted in order to help understand the evolving dynamics of the telecommunication businesses in ASEAN, changing individual business constraints, and their new challenges to regional integration.
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Recommendations by Action Point

Enhance implementation of mutual recognition arrangements (MRAs)	ASEAN should continue to undertake in-depth study with projects related to standardisation other than for software standards, which has already been completed through the “Survey of Existing ICT Standards on ICT Products and Services in ASEAN with a Pilot Study on Common Software Development Standards” project.
Provide incentives or grants to promote e-Services and content development	Strong incentives may be applied in the AMS to encourage further content development.
Survey and study to identify gaps and determine e-Services to be developed	Three types of e-Services, which are e-Government, e-Health, and e-Education, identified in the “ASEAN e-Services Identification” project as services important to ASEAN citizens should be developed further in ASEAN.
Outreach campaign to promote awareness of cyber-security	The emerging concerns over internet security and privacy across the world signify an ever-growing threat to ASEAN as well. Therefore, ASEAN should systematically and constantly assess the strength and weakness of ASEAN cybersecurity systems, and identify potential vulnerabilities. By doing so, it would allow businesses in ASEAN to become more resilient to new types of cyber attack. This could be achieved by means such as annual forums, meetings or other activities to create public awareness.
Promote secure transactions within ASEAN	ASEAN should continue with projects that study the development of mechanisms for publishing classified applications as well as a further study on laws and regulations on electronic authentication, identity proofing, and privacy protection across ASEAN.

Strategic Thrust 3: Innovation

Establish networks of COEs	ASEAN should continue promoting the establishment of CoEs beyond the completion of past projects, following up on the initiation introduced in the workshop on promoting the establishment and connection of ICT Centers of Excellence in ASEAN member countries.
Develop ASEAN digital content exchange	ASEAN should initiate projects or workshops that will assist each AMS in establishing its own matter-specific digital content portal.

Recommendations by Action Point

Promote Intellectual Property Rights (IPR) at the ASEAN level to safeguard innovation	It is imperative that ASEAN promote intellectual property at a macro level, such as creating public awareness on the importance of intellectual property or doing so through integration into national education curricula. This next step should be conducted cooperatively across sectors, not just the ICT industry, to create and furnish a suitable business environment that can safeguard intellectual property.
Recognise and reward ICT innovators	ASEAN should assess the impact of these recognitions and awards on the development of the region’s ICT industry. In addition, the ASEAN ICT Awards could expand its iteration to cover other aspects/fields of the ICT industry, increasing the number of awards to be given out each year. This would provide more incentives for the development of the ASEAN ICT industry in those respective fields.
Launch the ASEAN CIO Forum	ASEAN should continue to support the annual ASEAN CIO Forum and ASEAN CIO Association. The benefit of holding this Forum should range beyond the simple sharing and exchange of information among ASEAN CIOs; the Forum should also act as a symbol of ASEAN’s commitment to leveraging and utilising ICT as an engine of regional integration.
Ensure every child has access to broadband internet	ASEAN should continue to promote the increased installation of broadband internet in ASEAN. The goal of this Action Point, as reflected in its title name, is highly difficult to achieve since there exist large gaps between the levels of economic development in different AMS. It remains that some schools, particularly schools in the rural areas of the developing ASEAN countries, are struggling to have real usable broadband internet.

Strategic Thrust 4: Infrastructure Development

Establish an ASEAN Broadband Corridor	A study under the AIM 2015 suggested that there exists a variation between each AMS level of national broadband development. Therefore, the recommendation is made that ASEAN should make attempts to support and promote the national development of broadband internet systems, particularly in countries with high opportunity for development.
Establish an ASEAN Internet Exchange Network	ASEAN could combine the results of the existing fora (Regulator-Operator Forum) with a cost assessment and a review of peering amongst ASEAN ISPs, so as to identify the necessary requirements for the ASEAN Internet Exchange.
Develop a common framework for network security	It is recommended that ASEAN engage more stakeholders in a way that would allow regulators and policymakers across ASEAN to gain more insights into how ASEAN could move forward as a single community with a secured internet networking system.

Recommendations by Action Point

Develop a common framework for information security	It is important that awareness be created among the citizens of ASEAN regarding the importance of internet information security. Also, a study on the best practices of anti-internet abuse should also be conducted and shared.
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Strategic Thrust 5: Human Capital Development

Develop a registry of experts and innovators	ASEAN should initiate more studies on ICT human resources and manpower development. The studies could be conducted by obtaining best international practices. The end result would furnish the AMS with a better understanding of their ICT manpower strengths and weaknesses, hence providing the knowledge to properly develop their domestic and regional ICT human resources.
Create an ASEAN ICT Scholarship Programme	Awarding scholarships should be ASEAN’s primary focus as the work cycle on AIM 2020 begins. Furthermore, to make best use of this activity, results from past or future projects related to specific IT skills needed in ASEAN should be utilised in order to target scholarships to those who will contribute most to the regional ICT labour market.
Establish MRA for skills certification	There should be a focus on the implementation of a set of ASEAN standard definition of ICT skills.
Develop ICT certification and a skills upgrading programme	It is recommended that Training Roadmap developed in the “ASEAN ICT Skill Upgrading and Development” project is adopted and utilised by the AMS.

Strategic Thrust 6: Bridging the Digital Divide

Review of USO or similar policies	In the “In-depth Study on the Harmonisation of Interconnection, Licensing, Competition and USO – ATRC” project, it was found that traditional models for Universal Service Obligation Funds may not be efficient enough to deliver tangible results in a timely manner. Thus, ASEAN should pursue further studies on alternative means of USO fund disbursement.
Prioritise roll-out to schools	ASEAN should make attempts to support each individual ASEAN nation to pursue its own national agenda or initiations that support the fulfilment of this Action Point. At the regional level, ASEAN should continue initiating projects that are similar to the Laos-led “Free open source software adoption in secondary schools” project, particularly with regard to increasing access to more affordable or free ICT products.

Recommendations by Action Point

Collaborate between ICT and education sectors within ASEAN	It is recommended that ASEAN continue organising events similar to the “International Conference on Teaching and Learning with Technology 2014” project, as it would provide a stage on which participants around ASEAN could share and learn new methods of learning with technology.
Promote ASEAN integration through exposure to different cultures within ASEAN at an early age	In addition to the ASEAN Cyberkids Camp, ASEAN should initiate other events such as Cybercamps for teachers and practitioners which would encourage cross cultural exposure.
Collaborate with relevant ministries	ASEAN should increase coordination with working bodies of other specific fields of ICT; that is, there are imperative needs to understand the particular demands of specific fields of the ICT industry, which would allow an appropriate identification of national ministries and agencies.
Bridge the digital divide within ASEAN	Any project or attempts to bridge the digital divide in ASEAN should include participants from private sector entities and related stakeholders. This will undoubtedly enhance the power of attempts to narrow or bridge the gaps that currently exist in the digital divide in ASEAN.

It is hoped that, in the years to come, cooperation among the AMS will be reinforced and continued so ASEAN will be ready for the new challenges that will occur and be able to achieve the goal of becoming a single community that is wise with information and communication technology in accordance with the vision of AIM 2020 *“To propel ASEAN towards a digitally-enabled economy that is secure, sustainable, and transformative; and to enable an innovative, inclusive and integrated ASEAN Community”*.

APPENDIX
List of Projects under AIM 2015

Action point	Project Title	Proponent Country	Year
Strategic Thrust 1: Economic Transformation			
Initiative 1-1: Create a conducive environment where businesses can grow leveraging ICT			
Develop a framework to facilitate transparent and harmonised ICT regulations	Enhancing ICT Adoption by Small and Medium Enterprises	Singapore	2011
	The Study of Legal, Regulatory Issues and Operational Experiences from ASEAN Member States Telecommunications Regulators of the CLM Countries	Cambodia	2013
	Long Term Evolution (LTE) Workshop	Malaysia	2013
	ASEAN Telemedicine Protocol and Standards Harmonization	Philippines	2013
	IPv6 Collaborations in ASEAN 2012	Thailand	2013
	Promote and Encourage the Deployment of IPv6 for Small and Medium Enterprises (SMEs)	Viet Nam	2013
	Study on Cloud Computing in ASEAN for ICT Framework and Policy Initiative	Thailand	2014
	Study on Transparency of Broadband Internet Access Speeds in ASEAN Member States	Singapore	2014
	Guidelines of OTT Management Policy for AMS	Viet Nam	2014
	Spectrum Regulatory Approach for TV White Space Devices	Viet Nam	2015
	Study on Digital Dividend Spectrum Re-Allocation Approaches Towards Mobile Broadband Usage – Phase 2	Viet Nam	2015
	Stocktaking on Initiatives that Facilitate Sharing and Exchanging of Business Information amongst ASEAN Countries	Viet Nam	2013
Initiative 1-2: Develop Public-Private Partnership (PPP) initiatives for the ICT industry			
Share various PPP models and practices amongst ASEAN countries to formulate PPP models for the implementation of ICT projects	PPP Model for ICT	Singapore	2011
	Replicating ASEAN Best Practices in ICT for Disaster Risk Management	Philippines	2013
	Study and Propose the Partnership Model for Telecenters in order to Sustainably Develop the Broadband Service in Low-Income, Rural Areas in ASEAN Member States (AMSs).	Viet Nam	2014
	Regulatory Framework for PPP in the Provision of Broadband PassiveInfrastructure in ASEAN	Indonesia	2015

Action point	Project Title	Proponent Country	Year
Strategic Thrust 2: People Engagement and Empowerment			
Initiative 2-1: Ensure affordable broadband access to every community			
Study to lower intra-ASEAN roaming charges	ASEAN-EU Workshop on International Mobile Roaming Charge	Singapore	2011
Initiative 2-2: Ensure affordable ICT products			
Enhance implementation of mutual recognitionarrangements (MRAs)	Enhancing the Implementation of MRAs	Indonesia	2013
	Survey of Existing ICT Standards on ICT Products and Services in ASEAN with a Pilot Study on Common Software Development Standards	Thailand	2013
Initiative 2-3: Ensure affordable and seamless e-services, content and applications			
Survey and study to identify gaps and determine e-Services to be developed	ASEAN e-Government Strategic Action Plan	Thailand	2011
	Stocktaking among ASEAN for Database Development of Smart ICT Applications & Services towards e-Society	Philippines	2013
Provide incentives or grants to promote e-Services and content development	ASEAN e-services Identification	Thailand	2012
Initiative 2-4: Build trust			
Outreach campaign to promote awareness of cyber-security	ITU-ASEAN Dialogue on Promoting Effective, Trustworthy & Secured Social Media	Malaysia	2011
	ASEAN Cybersecurity Week	Malaysia	2014
Promote secure transactions within ASEAN	Intra-ASEAN Secure Transactions Framework	Thailand	2011
	Intra-ASEAN Secure Transactions Framework Implementation Workshop	Thailand	2015
Strategic Thrust 3: Innovation			
Initiative 3-1: Create Innovation Centres of Excellence (COE) for Research and Development (R&D) of ICT services			
Establish networks of COEs	Workshop on Promoting the Establishment and Connection of ICT Centers of Excellence in ASEAN Member Countries	Viet Nam	2012
	2nd ASEAN ICT CoE workshop: Consolidating and Strengthening Connection and Cooperation between ICT CoEs in ASEAN	Viet Nam	2015

Action point	Project Title	Proponent Country	Year
Strategic Thrust 3: Innovation			
Develop ASEAN digital content exchange	ASEAN Digital Content Exchange	Malaysia	2012
	Community e-Classroom	Thailand	2012
	Workshop on Setting-up National Statistics Portal (with ITU)	Philippines	2013
Promote Intellectual Property Rights (IPR) at ASEAN level to safeguard innovation	Workshop on Measure to Promote Intellectual Property Rights (IPR) in ICT sector across ASEAN	Viet Nam	2012
Initiative 3-2: Promote innovation and collaboration amongst government, businesses, citizens and other institutions			
Recognise and reward ICT innovators	The 1st ICT Innovation Award (ASEAN ICT Award)	Brunei Darussalam	2011
	The 2nd ASEAN ICT Award	Brunei Darussalam	2013
	The 3rd ASEAN ICT Award	Brunei Darussalam	2014
	Workshop on Promoting Green ICT and Green Growth for Sustainable Development in ASEAN Member Country	Viet Nam	2014
	The 4th ASEAN ICT Award	Viet Nam	2015
Launch the ASEAN CIO Forum	The 1st ASEAN CIO Forum	Brunei Darussalam	2011
	The 2nd ASEAN CIO Forum	Brunei Darussalam	2013
	The 3rd ASEAN CIO Forum and the ASEAN CIO Association	Brunei Darussalam	2014
	The 4th ASEAN CIO Forum	Brunei Darussalam	2015
Initiative 3-3: Nurture innovation and creativity at schools			
Ensure every child has access to broadband internet	Promoting Broadband Connectivity to Schools within ASEAN through TV White Space Technology and New Emerging Technologies	Philippines	2013

Action point	Project Title	Proponent Country	Year
Strategic Thrust 4: Infrastructure Developmen			
Initiative 4-1: Improve broadband connectivit			
ASEAN Broadband Corridor	Workshop for ASEAN ccLTD in the Adoption of IPV6 and DNSSEC in Domain Name System (DNS)	Malaysia	2011
	ASEAN Broadband Corridor	Singapore	2011
	Plan to Increase Capacity to Meet Data Demand in ASEAN for the Next 5 Years	Malaysia	2013
	Refarming of the 2G Frequency for the Mobile Broadband System	Viet Nam	2013
	Policy and Regulatory Dialogue on the Strategic Action Plan to Address the Challenges of Connected ASEAN	Viet Nam	2014
	Roadmap for Broadband Capacity in ASEAN – A Study of Data Demand in ASEAN to Conceptualize a Five Year Plan to Address Data Demand in ASEAN (Phase 2)	Malaysia	2015
	Japan - ASEAN Training Course on Strategic Planning to Develop Mobile Internet Ecosystem in ASEAN Countries	Viet Nam	2015
Establish an ASEAN Internet Exchange Network	ASEAN TELSOM Infrastructure Development Task Force (AIX, AIG, International Diversity)	Indonesia, Philippines, Thailand	2011
	Regulator-Operator Forum (under the Purview of the TELSOM Infrastructure Task Force)	Indonesia	2012
	Promoting Diversity of International Connectivity among ASEAN Member States	Philippines	2012
	Regulator-Operator Forum II (under the purview of the TELSOM Infrastructure Task Force)	Indonesia	2013
Initiative 4-2: Promote network integrity and information security, data protection and CERT cooperation			
Develop common framework for network security	ASEAN CERT Incident Drill (ACID) (conducted annually)	Singapore	2006 - Present
	Network Security Regulation - ATRC	Malaysia	2011
	CERT/CIRT Readiness Assessment for CLMV (with ITU)	Myanmar	2011
	Sub Marine Cable Protection (with ITU)	Philippines	2011

Action point	Project Title	Proponent Country	Year
Strategic Thrust 4: Infrastructure Developmen			
	The 1st ASEAN Network Security Action Council Meeting (ANSAC)	Malaysia	2012
	The 2nd ANSAC Meeting	Malaysia	2013
	Protection Regime for Submarine Cable Systems within ASEAN	Philippines	2013
	The 3rd ANSAC Meeting	Malaysia	2014
	The 4th ANSAC Meeting	Malaysia	2015
Develop common framework for information security	Business Recovery and Continuity Planning	Malaysia	2013
	Public Private Partnership on Data Center Security	Lao PDR	2014
Strategic Thrust 5: Human Capital Development			
Initiative 5-1: Build capacity			
Develop a registry of experts and innovators	Training Course on ICT Strategic Planning for ASEAN Countries	Viet Nam	2011
	Develop a Registry of Experts and Innovators	Viet Nam	2013
	Report on Current Status and Forecast of ICT Human Resources Demands in ASEAN to 2020	Viet Nam	2014
Create ASEAN ICT Scholarship Program	Create ASEAN ICT Scholarship Programme	Indonesia	2013
Initiative 5-2: Develop skills upgrading and certification			
Develop ICT certification and skills upgrading program	ASEAN ICT Skills Upgrading and Development	Thailand	2014
Establish MRA for skills certification	ASEAN ICT Skill Standards Definition and Certification (Phase I)	Thailand	2011
	ASEAN ICT Skill Standards Definition and Certification (ASEAN-ISSDac) Phase II	Thailand	2012
Strategic Thrust 6: Bridging the Digital Divide			
Initiative 6-1: Review of Universal Service Obligation (USO) or similar policies			
Review of USO or similar policies	In-Depth Study on Harmonization of Interconnection, Licensing, Competition and USO	Brunei Darussalam, Viet Nam	2011

Action point	Project Title	Proponent Country	Year
Strategic Thrust 6: Bridging the Digital Divide			
	Universal Services Obligation (Initiatives and KPIs for USO) – Workshop on Setting up a Framework for Universal Service Obligation Fund (USOF)	Thailand, Viet Nam	2011
	Facilitating the Provision of Broadband to Every School by strengthening USO Policy in ASEAN (Review of USO Policy not only School)	Viet Nam	2011
Initiative 6-2: Connect schools and advocate early ICT education			
Prioritize roll-out to schools	Free Open Source Software Adoption in Secondary Schools	Lao PDR	2014
Collaborate between ICT and education sectors within ASEAN	Collaboration with the International Conference on Teaching and Learning with Technology (iCTLT) 2014	Singapore	2014
Promote ASEAN integration through exposure to different cultures within ASEAN at an early age	ASEAN Cyberkids Camp 2011	Malaysia	2011
	ASEAN Cyberkids Camp 2012	Malaysia	2012
	ASEAN Cyberkids Camp 2013	Malaysia	2013
	ASEAN Cyberkids Camp 2015	Indonesia	2015
Initiative 6-3: Improve access and relevance of information			
Collaborate with relevant ministries	Collaboration with other Ministries to Promote and Acceleratethe Adoption of ICT in Rural Communities	Indonesia	2014
	Collaboration with other Ministries to Measure ICT Adoption in ASEAN	Philippines	2014
Initiative 6-4: Bridge the digital divide within ASEAN			
Bridge the digital divide within ASEAN	ASEAN TELSOM Bridging the Digital Divide Task Force	Malaysia	2011
	Workplan for Digital Divide	Malaysia	2011
	ASEAN Sign Language Computer Application for Hearing Impaired / I-CHAT	Indonesia	2013
	Training Program of ICT and IT for Elderly and People with Disabilities in ASEAN	Thailand	2013
	Consumer Awareness Workshop	Thailand	2014



The Association of Southeast Asian Nations (ASEAN)

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