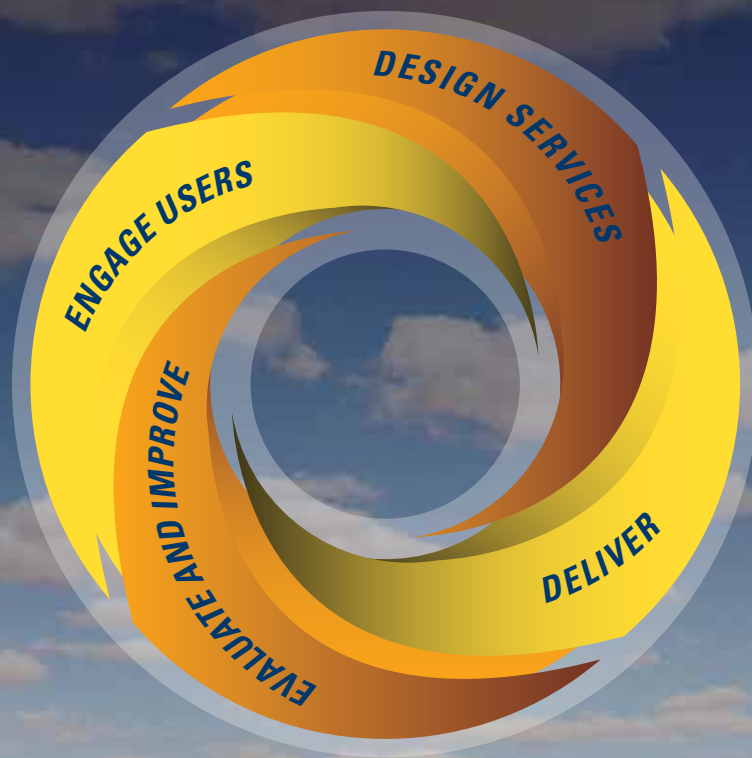


THE WMO STRATEGY FOR SERVICE DELIVERY AND ITS IMPLEMENTATION PLAN



World
Meteorological
Organization

Weather · Climate · Water

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PREFACE


The core business of National Meteorological and Hydrological Services (NMHSs) is built around their responsibility to provide essential weather, climate and related information to the community at large. In the provision of weather-, climate-, water- and environment- related services, it is essential to put the users first. It is only by fully understanding why they need our services and how they use them in their decision-making that we can provide services which are optimal. By striving to provide services that best meet these needs, NMHSs ensure that they fulfil their statutory obligations and are consequently held in high regard by the public, governments and users.

Service delivery lies at the heart of the WMO mission and daily work. The WMO Strategy for Service Delivery, which is aligned with the WMO Strategic Plan, was approved by the Sixteenth World Meteorological Congress. The Strategy explains the importance of service delivery; defines the four stages of a continuous, cyclic process for developing and delivering services and the elements necessary for moving towards a more service-oriented culture; and describes practices to strengthen service delivery across the entire WMO. The Strategy, described in Part I, is considered an essential complement to the Implementation Plan, presented in Part II.

The Implementation Plan has been developed to guide NMHSs in assessing and improving their current service delivery in line with their strategic objectives. Improving levels of service delivery will directly benefit service users and, as a result, lead to stronger community support for the NMHSs.

WMO is committed to developing mechanisms that will assist NMHSs in implementing the WMO Strategy for Service Delivery. The Implementation Plan will be published as a recommended practice and will be referenced, as appropriate, in the *Technical Regulations* (WMO-No. 49).

All Members are encouraged to use the Implementation Plan for the WMO Strategy for Service Delivery to assess where they stand in terms of service delivery and continue their efforts to achieve ever higher standards.



Michel Jarraud
(Secretary-General)

EXECUTIVE SUMMARY

WMO Members recognize the importance of providing high-quality delivery of weather-, climate-, water- and environment- related services. WMO facilitates international coordination, sets standards for meteorological and hydrological products and provides guidance on service delivery. While some great success has been achieved in this regard, Members have agreed that a more uniform and structured approach to service development and delivery is required. As a result, the WMO Strategy for Service Delivery (the Strategy) was approved at the sixteenth session of the World Meteorological Congress (May–June 2011), and the Secretary-General was requested to arrange for the preparation of an implementation plan. The Implementation Plan was subsequently prepared under the guidance of the WMO Executive Council Working Group on Service Delivery (ECWG-SD) and was approved by the Executive Council at its sixty-fifth session (May 2013).

The goal of the Strategy is to help National Meteorological and Hydrological Services (NMHSs) raise standards of service delivery in the provision of products¹ and services¹ to users¹ and customers.¹ The Implementation Plan provides a flexible methodology to help Members evaluate their current service delivery practices and to serve as high-level guidance for developing more detailed methods and tools that will enable Members to improve their service delivery process.

The Strategy is adaptable to the unique needs of Members from both developed and developing countries, regardless of who the users are and whether the products and services delivered are public or commercial. The WMO Secretariat and WMO constituent bodies are responsible for facilitating and coordinating the implementation of the Strategy.

Meeting the needs of users with fit-for-purpose¹ products and services is vital for the success of Members as service providers. As the needs of users evolve, the capabilities of service providers should also adapt over time. Methods of distributing products and services are subject to change, especially in the modern era of information technology, and it is important that Members remain agile and capable of responding to these changes.

WMO Members who have already implemented a formal quality management system (QMS) are more likely to be focused on meeting user needs and to consider this a key aspect of service delivery. For Members who have not introduced a QMS, implementing a service delivery strategy along the lines described herein will be an excellent step towards improved organization-wide quality management.

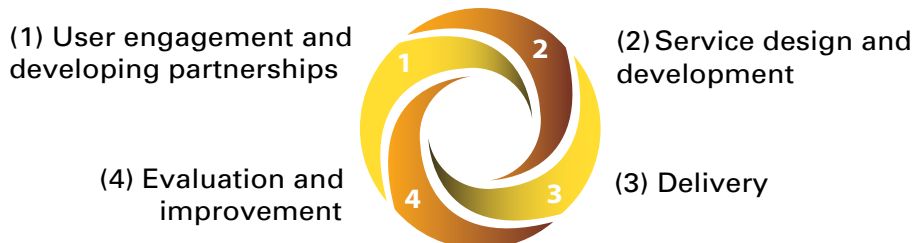
Members who provide commercial services, which involve contractual obligations, are no doubt acutely aware of the need for high standards in service delivery, but high-quality delivery should also apply to weather-, climate-, water- and environment- related services that are provided to the public and to government agencies and departments.

For users who are sensitive to the impacts of weather and climate, the benefits of receiving high-quality services that fully meet their needs are wide-ranging. Members who provide high levels of service delivery through their public weather services (PWS) are likely to be viewed by their users and the organizations that fund them as a valuable return on the investment of public funds. This can help to ensure the sustainability of PWS.

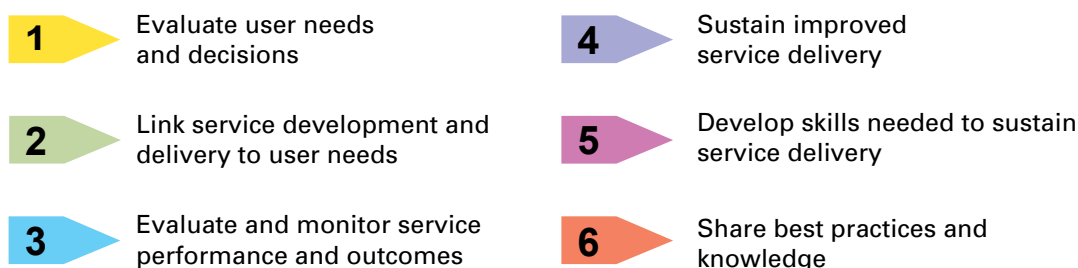
The Strategy describes a continuous cycle of four stages, which define the framework for service delivery, and identifies six elements that detail the activities required for high-quality service delivery.

¹ See glossary for definition (Appendix 3)

The four stages of a continuous, cyclic process for developing and delivering services are:



The six elements necessary for moving towards a more service-oriented culture are:



The management of service-providing organizations must remain focused and committed to ensure that high-quality service delivery is achieved throughout their organizations.

The Implementation Plan for the Strategy has been developed to help all Members assess and improve their service delivery irrespective of their current level and capacity.

Current levels of service delivery can be assessed either by the service providers themselves or with external assistance. The assessment should be made with the help of a progress model which shows the type of activities and behaviours that are appropriate for service providers with a certain level of service delivery development. A Service Delivery Progress Model is included in this Implementation Plan to guide Members on the actions and activities required to progress to higher levels of service delivery over the short, medium and long term.

Milestones for the implementation of the Strategy are set for the short term (2 years), medium term (6 years) and long term (10 years).

The key deliverables resulting from the implementation of the Strategy over the short term will be: (i) an assessment of the current level of service delivery; (ii) putting in place the necessary action plan to start improving service delivery, which should include strengthening user interaction through, for example, surveys, focus groups or workshops for each user group; and (iii) an assessment of the resources required to implement the action plan. Over the medium term, the Implementation Plan aims to help a certain percentage of Members gain at least one level in their service delivery development and to document the process and share lessons learned with other Members. Over the long term, the aim of the Strategy is to develop or strengthen a service culture and facilitate the mainstreaming of service delivery in the programmes and activities of Members' service providers, resulting in a tangible improvement in the user's perception of their services.

The WMO ECWG-SD will have the overall responsibility for monitoring progress and facilitating the implementation of the Strategy by NMHSs.



PART I. THE WMO STRATEGY FOR SERVICE DELIVERY

PURPOSE OF THE DOCUMENT

The purpose of this document is to propose a World Meteorological Organization (WMO) Strategy for Service Delivery (the Strategy) that will assist National Meteorological and Hydrological Services (NMHSs) in the provision of weather-, climate-, water- and environment-related services to the public and decision-makers. The Strategy incorporates assessment of user needs and the application of performance metrics.

While there is no definitive way to provide services, the Strategy lays the groundwork for Members to improve service delivery by sharing best practices, supporting mutually agreed upon guidelines and increasing user engagement throughout the delivery process. At the same time, it recognizes the many differences in culture, structure, operational practices and resource and development levels of NMHSs.

This Strategy, which is both broad and flexible, seeks to do two things: (i) to serve as a tool for evaluating current service delivery practices, and (ii) to provide high-level guidance for developing more detailed methods and tools to better integrate users into the service delivery process. It is adaptable to the unique needs of providers in both developed and developing countries, regardless of who the users are and whether the products and services delivered are public or commercial. The role of the WMO Secretariat will be to facilitate and coordinate the implementation of the Strategy.

Definitions of key terms used in the Strategy and the Implementation Plan are provided in a glossary (see Appendix 3).

CHAPTER 1: INTRODUCTION

The primary goal of most government organizations is to fulfil their mission. To achieve this goal, organizations need resources, but resources are often in short supply and must be shared among competing organizations. This competition for scarce resources requires NMHSs to demonstrate their value by realizing cost efficiencies while delivering high-quality and useful products and services. Policymakers and the public continually assess the effectiveness of NMHSs based on their ability to meet the service delivery standards of the nations they serve. Customers and users are more likely to receive services that meet their needs when NMHSs incorporate the role of these users and customers into their day-to-day operations.

The ability of NMHSs to meet national service needs is put to the most critical test when an extreme hydrometeorological event occurs. Even the best forecast, issued on time, will have little impact if it did not generate the desired response from those at risk. Most of the utility of weather-, climate-, water- and environment-related information stems from the communication of this information to users, and the response of those users based on such information. Ultimately, the utility of weather-, climate-, water- and environment-related information depends on the degree to which it has a beneficial impact on societal and economic outcomes. When available information is underutilized, value can be increased by improving the forecast, enhancing communication and refining the decision-making process. Effective service delivery, then, is about providing products and services that bring utility to users and customers.

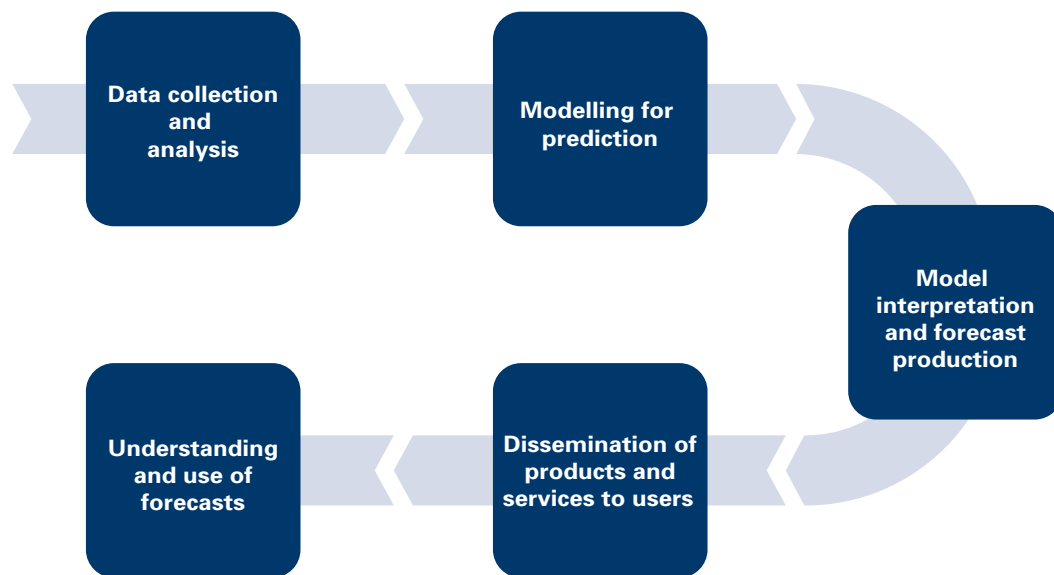
Much has been done by WMO to improve service delivery through various international and regional institutions and through programmes and structures such as World Meteorological Centres and Regional Specialized Meteorological Centres, with a view to preparing and providing products that serve as a basis for NMHSs to use in the provision of services. Similarly, at the national level, many NMHSs have made a significant effort to improve service delivery by building relationships with various user communities to better understand and respond to their needs.

This Strategy seeks to build upon and institutionalize such practices to strengthen service delivery across the entire WMO by describing key strategy elements and activities related to a service-oriented culture. The Strategy focuses on understanding the users' value chain in order to gain knowledge about users, the decisions they must make and how weather-, climate-, water- and environment-related information is applied to minimize risk and provide benefits not only for specific user groups but also for society as a whole. With this knowledge, service providers are able to develop, produce and deliver services that are useful, relevant and responsive. NMHSs are able to measure the value of their information to society and continually evaluate and improve these services. Adopting a more collaborative approach provides everyone in the service delivery process – providers, users and partners – with a clear understanding of service needs.

CHAPTER 2: LINK TO THE WMO QUALITY MANAGEMENT FRAMEWORK

WMO encourages NMHSs to implement quality management systems (QMSs) and has defined a Quality Management Framework (QMF) to provide advice on the development and use of QMSs relevant to meteorological and hydrological organizations. The ultimate goal of a QMS is to encourage and support the continual enhancement of products and services, focusing on quality control, quality assurance and quality improvement.

Quality management assesses not only the final product or service but also the series of steps or operations taken to produce and deliver the final product or service in a manner that satisfies the customer. The insight gained through quality management allows NMHSs to find, fix and prevent problems that might lead to a faulty product or service. In the context of weather services, for example, the processes that make up a weather forecast and service delivery are:



To improve the quality of weather products and services, NMHSs must assess and analyse each step and substep of the forecast process to determine where root problems may exist and how to correct them in a more effective manner. For example, QMS processes may find that a high-quality product is of marginal use because it is not received by the user in time for decision-making.

Improvements in service delivery, then, are a natural consequence of using QMSs. The WMO Strategy for Service Delivery may be viewed as a supplement to the WMO QMF. Even if NMHSs are not required to apply QMSs, this approach stands out as a useful tool to improve the overall effectiveness of products and services and customer/user satisfaction.

AN EXAMPLE OF A BASIC APPROACH TO QMS

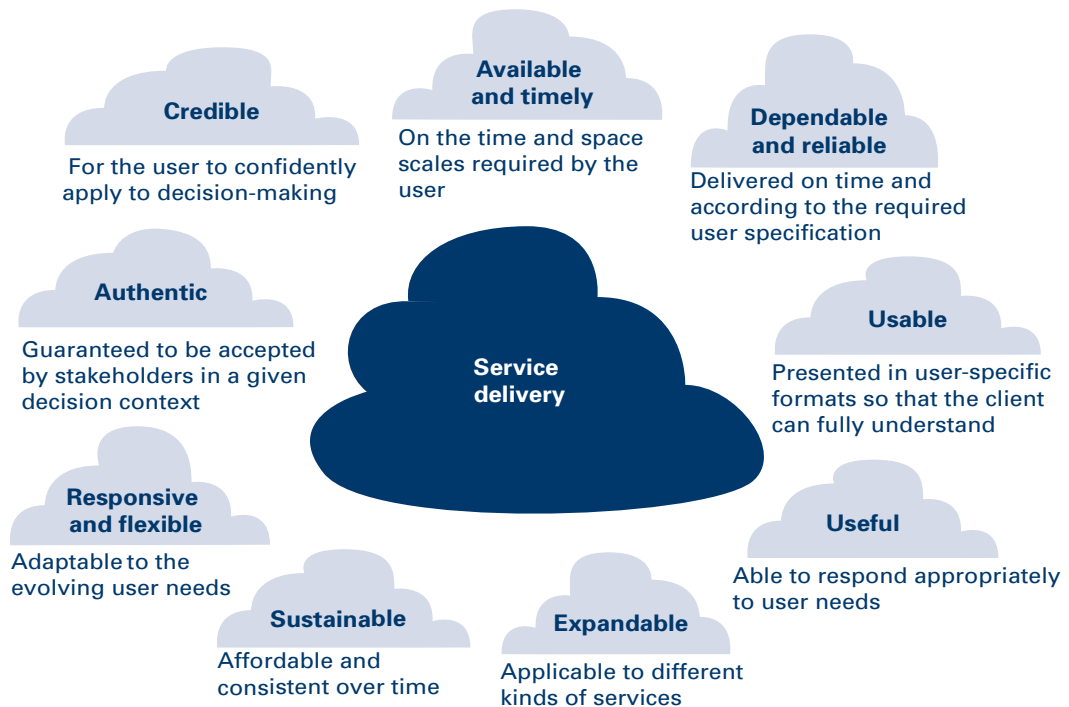
The Malaysian Meteorological Service (MMS) implemented a process-based QMS at the Kuala Lumpur International Airport Forecast Centre as a means of institutionalizing effective service delivery. This was done to improve the provision of consistent products and services that meet customer requirements, to raise customer satisfaction through continuous process improvement and to establish quality metrics that measure, review and control the forecasting processes.

The top management of the MMS is responsible for the QMS process and is constantly upgrading its effectiveness by:

- Identifying customer needs and ensuring customer/client satisfaction through questionnaires, feedback and reviews;
- Communicating regularly with regional forecast offices to ensure and meet customer satisfaction through various avenues including meetings, staff discussions and training;
- Determining the quality policy and objectives;
- Conducting management reviews;
- Identifying and ensuring the availability of resources including skilled personnel, infrastructure, finances, training and internal audit teams.

CHAPTER 3: WHAT IS SERVICE DELIVERY?

To understand “service delivery”, one must first understand what is commonly meant by “service”, which this Strategy defines as a product or activity that meets the needs of a user or can be applied by a user. To be effective, services should be:



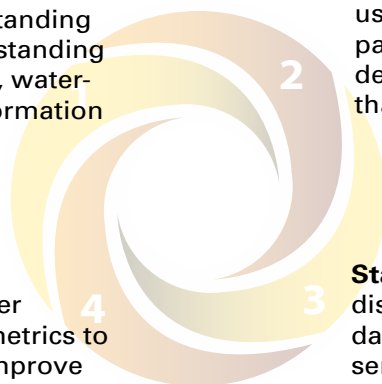
Service delivery, then, is a continuous, cyclic process for developing and delivering user-focused services. It is further defined in four stages:

Stage 1: User engagement and developing partnerships – identifying users and understanding their needs, as well as understanding the role of weather-, climate-, water- and environment-related information in different sectors.

Stage 2: Service design and development – the process, involving users, providers, suppliers and partners, of creating, designing and developing services and ensuring that user needs are met.

Stage 4: Evaluation and improvement – collecting user feedback and performance metrics to continuously evaluate and improve products and services.

Stage 3: Delivery – producing, disseminating and communicating data, products and information (i.e., services) that are fit for purpose and relevant to user needs.




The following four principles embody an effective delivery of weather-, climate-, water- and environment-related services:

- User engagement and feedback are essential for designing and delivering effective services;
- Sharing best practices leads to effective and efficient service design and implementation;
- Partnerships with other international and regional organizations also engaged in delivering services are essential for maximizing the use of weather-, climate-, water- and environment-related information in the decision-making process;
- The concepts and best practices of service delivery are applied to all WMO activities and accepted by the entire WMO.

AN EXAMPLE OF COLLABORATION AMONG DIFFERENT AGENCIES

The National Oceanic and Atmospheric Administration and the National Science Foundation in the United States of America developed the Communicating Hurricane Information Program, which focuses on advancing the understanding of decision-makers (such as emergency managers or elected officials) and the general public on hurricane outlooks, forecasts, watches and warnings. The programme demonstrates how national agencies can partner together to support integrated weather-society work that advances people's fundamental understanding of weather-related issues and addresses the agencies' need to fulfil their missions.

CHAPTER 4: MOVING TOWARDS A SERVICE-ORIENTED CULTURE

This Strategy identifies six elements  and associated high-level activities that are necessary for moving towards a more service-oriented culture. The elements should assist service providers in identifying current areas of success, which may be shared as best practices across WMO, and areas where improvements are needed. The elements and suggested activities described below serve as a framework to guide the development of implementation plans that will include more detailed processes, methodologies and tools.

WORKING WITH USERS IN DESIGNING AND DEVELOPING PRODUCTS – CHILE'S LEARNING THROUGH DOING PROJECT

Since 2008, the Meteorological Service of Chile (DMC) has been working with the WMO Public Weather Services Programme to implement the Learning Through Doing project with the objective of enhancing service delivery to the fisheries, agricultural and transport sectors. The project focuses on engaging users from these sectors in order to determine their needs and requirements and to design and produce improved products that meet those needs. It also focuses on improving dissemination and communication channels to ensure easy access to products. Multidisciplinary teams have been formed between the DMC and users from the sectors to steer the implementation of the project.

For example, in the transport sector there are a number of services targeting the Los Libertadores border complex, which serves the daily flow of traffic between Argentina, Brazil, Paraguay, Uruguay and Chile. Users of meteorological products and services include public transport services, tourists, freight transportation companies and passengers. Each of these users has different needs requiring different products and services.

The newly designed line of products consists of daily weather forecasts and weather warnings. The full report including all of the sectors is available at: http://www.wmo.int/pages/prog/amp/pwsp/Activities_and_Reports_en.html.

By 2010, the project had developed 22 new meteorological products and services, improved professional and technical skills in designing and implementing upgrades in products and services and enhanced dialogue and cooperation between users and the DMC, resulting in an increased uptake of meteorological products and services.

4.1 Strategy element 1: Evaluate user needs and decisions









The user of weather-, climate-, water- and environment-related information is at the centre of effective service delivery. Users take many forms – from the general public to government ministries, the military or private industries. Many NMHSs serve customers and users working for the government, including in the areas of disaster management, agriculture, transportation, health and tourism. NMHSs may also engage with intermediaries, such as the media, who represent a user group or who further develop products and services for end-users. The role of the provider is to identify these users, including intermediaries, to understand their needs and determine how NMHSs can meet those needs, either individually or in partnership with other providers and partners. The evaluation of user needs is not a one-time requirement but a continuous and collaborative part of the service delivery process.

Key activities



Depending on the user group, the provider should regularly engage with users to discuss needs and performance. These represent opportunities for the provider to better understand the users' business, their mission and goals, the types of decisions they make on a regular basis, how risk is managed and how the provider's services may contribute.

The following are typical questions to ask any user or customer:

-  What is your mission?
-  How do you accomplish your mission?
-  What are your goals and how can we contribute?
-  How do you use our services?
-  How can we improve them?
-  What types of decisions do you have to make?
-  What would help you make better decisions?
-  How do you measure success?

Providers should facilitate communication and use of weather-, climate-, water- and environment-related information, and in some cases, provide training on specific products and services. User engagement is also a good opportunity to discuss, promote and facilitate interdisciplinary research and development of user-specific products and services.

How to engage users will vary by user group and country. Interactions may be formal or informal, in person or virtual, and may occur through forums, focus groups, workshops, meetings, conferences, surveys, correspondence or face-to-face with individual users. The frequency of these interactions will vary, but must be ongoing and should take place more than once a year. They should not only involve users, but also partners, such as private sector organizations and the media, and other government organizations, as necessary.

NMHSs should leverage existing WMO guidance and toolkits (see Appendix 4), as well as new guidance and best practices coordinated by the WMO Secretariat to build a core set of service delivery criteria. NMHSs should develop methods and tools to document and validate user needs and expectations and to communicate them within the organization and to other partners as necessary. User needs should then be converted into requirements to be met by existing or new products and services.

User requirements should be evaluated to ensure that they fall within the mission of NMHSs and that NMHSs have the capability to meet those requirements. Evaluating user needs for such purposes is what this Strategy calls "fit for purpose". NMHSs should not evaluate user needs in isolation, but rather in collaboration with users, providers and partners. Having a service be fit for purpose implies

AERONAUTICAL METEOROLOGICAL SERVICES

Focusing on the customer is considered the most important quality management principle by aeronautical meteorological service providers. Customer requirements are documented through relevant bodies of the International Civil Aviation Organization (ICAO) and national regulatory agencies, and the quality of services as perceived by the customer is monitored. This is achieved through verification and evaluation processes, regular customer satisfaction surveys, liaison group meetings with customer representatives (such as pilots, dispatchers, air traffic personnel and civil aviation regulators) and visits to the operation facilities of airlines and to meteorological offices. User suggestions and feedback are formally recorded and followed up. A formal response is given to the user before a suggestion or feedback is considered closed. The liaison group meetings also provide a forum for considering and documenting agreements on local arrangements for the provision of aeronautical meteorological services as stipulated in ICAO: Annex 3 – Meteorological Service for International Air Navigation / WMO: Technical Regulations (WMO-No. 49), Volume II - Meteorological Service for International Air Navigation, C.3.1. This user engagement process also helps to meet many of the audit requirements set by the QMS and aviation safety oversight.

Services for airports could be considered as an area for improvement. With the exception of Terminal Area Forecasts (TAFs) and basic warnings, services for airports are not covered by ICAO regulations and have to be agreed upon by both airport operators and service providers. This can lead to difficult situations when airports experiencing serious weather disruptions are either not relying on meteorological information at all or are receiving information from independent service providers that are not coordinated with the services for airlines and air traffic management.

that an agreement has been reached, either implicitly or explicitly, among all involved which takes into account some or all of the following:

- Current and evolving user needs;
- Provider capabilities, including strengths and limitations;
- What services will be provided and how they will be provided;
- How services will be used;
- Expectations of acceptable outcomes and provider performance;
- Acceptable costs or levels of effort;
- Risks inherent in applying information to decision-making.

NMHSs have limited resources and capacity, and therefore cannot be expected to provide everything to everyone. A clear fit-for-purpose agreement understood by all parties sets clear expectations and minimizes risk for NMHSs while achieving the best possible solution for users. If appropriate, NMHSs may want to explicitly outline the agreement reached with the user in a service-level agreement (SLA). Agreements with other suppliers or partners may be documented in operating-level agreements.

SERVICE-LEVEL AGREEMENT TEMPLATE

ARTICLE I. PARTIES

Describe the parties involved in the SLA.

ARTICLE II. SCOPE

SECTION 2.01 SCOPE

Describe the purpose and extent of the SLA.

SECTION 2.02 ASSUMPTIONS

Describe any assumptions underlying the defined scope.

SECTION 2.03 GOALS AND OBJECTIVES

Describe what the parties are expecting to accomplish with the SLA.

ARTICLE III. ROLES AND RESPONSIBILITIES

Describe the role of each party involved in the SLA and the responsibilities they must assume to comply with the SLA and deliver the products and services defined therein.

ARTICLE IV. EFFECTIVE DATE AND TERM

Indicate the date the agreement becomes effective and its duration.

ARTICLE V. DELIVERY AND PERFORMANCE

Describe in detail what each party is responsible for delivering and the key performance indicators to ensure compliance.

ARTICLE VI. REPORTING, REVIEWING AND AUDITING

Describe oversight and reporting on the agreement, when the agreement should be reviewed and the points of contact for reporting.

ARTICLE VII. COST/FUNDING AND PAYMENT

Document the costs associated with the SLA, who is responsible for paying or funding and when payments should be made. The cost may be broken down by specific line items, such as labour, supplies, equipment, travel, training, etc.

ARTICLE VIII. CHANGES AND MODIFICATIONS

Describe the process by which changes or modifications can be made to the SLA and who is responsible for making such changes.

ARTICLE IX. TERMINATION

Describe the terms for termination and the procedure to follow.

Such agreements should be prepared so as to reflect the current scientific uncertainties associated with forecasting weather, climate, hydrological and environmental events.

Effective user engagement throughout the service delivery process helps to increase knowledge of user needs. It also helps to gain an understanding of the impact of weather-, climate-, water- and environment-related information on protecting life and property, preserving the environment and promoting economic development and prosperity. This knowledge leads to more effective products and services that are better aligned with external demands and are fit for purpose.

4.2 Strategy element 2: Link service development and delivery to user needs

Gaining knowledge of users is of marginal use if such knowledge is not integrated into the design, development and delivery of services. NMHSs with service-oriented cultures produce products and services with the user at the centre of the development process. This means that NMHSs need processes and tools for translating requirements into tangible products and services and verifying that user needs and expectations are being met.

Linking service development and delivery to user needs necessitates an operating model that delivers forecasts and information at the time and in the manner specified by the user, and which provides users with the necessary support. Users will have different requirements, so the key is to develop an operating model that is flexible and adaptable to wide-ranging and evolving user demands. This includes adapting the workforce, systems, and technical and physical infrastructures.

WORKING WITH THE CUSTOMER TO OPTIMIZE FLOOD WARNINGS

A flood forecasting methodology, developed by Schröter et al,¹ was applied to two small river basins in Austria and Spain. The methodology was based on an assessment of the effectiveness and efficiency of early warning systems for flash floods. It focused on the development of optimal alerts by analyzing the trade-offs between the benefits of an increased lead time and the simultaneous decrease of warning reliability due to the longer lead time. The ability to reduce flood damage was determined based on a survey of users. The study considered that the increase in lead time would provide valuable opportunities for preparedness and prevention, whereas the decrease of warning reliability would cause economic loss in the case of false alarms. The assessment concluded that increasing the lead time for flash flood events does not produce the maximum societal benefits due to the decrease in reliability (i.e., higher false alarm rates). In fact, the optimal lead time for maximizing damage avoidance and minimizing production loss due to false alarms is not the longest lead time. In the Besòs basin in Spain, for example, the optimal warning lead time was two hours. In practice, this is the time where a “watch” becomes a “warning”.

¹ Schröter, K., M. Otrowski, C. Velasco, H.P. Nachtnebel, B. Kahl, M. Beyene, C. Rubin, M. Gocht, 2008: *Effectiveness and Efficiency of Early Warning Systems for Flash-Floods (EWASE)*. First CRUE ERA-Net Common Call – Effectiveness and Efficiency of Non-structural Flood Risk Management Measures. Available at: http://www.crue-eranet.net/partner_area/documents/EWASE_final_report.pdf.

One approach is to establish a real or virtual co-location of meteorologists and users of weather-, climate-, water- and environment-related information who work together to deliver products and services. This approach combines hydrometeorological information with user-specific data to determine impacts on the public and industry in areas such as energy grid management; construction; flood control and urban inundation; hospitals and health practitioners, emergency preparedness and response; transportation and so forth. Meteorologists may have a temporary or permanent assignment that enables them to work side-by-side with road management and maintenance specialists, public health experts, emergency responders and others. Users will benefit from an operational network that evolves to meet specific user needs, from forecast systems targeted to user decisions and from an integrated system that aligns weather-, climate-, water- and environment-related information with societal and economic impacts and user-specific information.

Key activities

NMHSs should develop and improve processes and tools that document and communicate user requirements to all parties involved, including the research community, developers, partners, budget and finance officials and others. Users should be brought in at various stages of the design and development process to evaluate and test products and services to ensure that they meet requirements and allow for optimal decision-making.

PUBLIC WEATHER SERVICE PLATFORM – METEOROLOGICAL SERVICE DELIVERY IN THE MEGA CITY OF SHANGHAI

The Shanghai Meteorological Service (SMS) of the Chinese Meteorological Administration (CMA) established an integrated public weather services (PWS) operations platform in 2009 to strengthen integration between the SMS, other agencies and specialized users. The platform aims to transform PWS delivery into routine work by specialized duty officers and to provide highly targeted and tailored services to a variety of institutional, governmental and specialized users and the public.

Under the direction of the Chief Service Officer, the platform develops products to assist decision-making in 26 sectors including government departments, emergency response agencies, the public and weather-sensitive users. The daily forecasts and warnings for the PWS platform are disseminated via SMS (short message service), television, radio, newspapers, magazines, the Web, the Basic Grid Unit management system, electronic screens, telephone and fax.

Processes should be monitored and evaluated. (See strategy element 3 for more details on evaluation and monitoring.)

In order to implement this strategy element, WMO should consider leveraging existing guidance and best practices to develop a minimum set of standards and benchmarks for the design, development and delivery of products and services that integrate users throughout the process. Using these standards and benchmarks as a basis for evaluation, NMHSs should conduct a current assessment of their service design, development and delivery practices to identify gaps between current practices

and WMO standards. NMHSs should use structured problem solving and process improvement methods to develop and implement plans for closing these gaps. WMO Members are strongly encouraged to share results and experiences obtained from these activities.

4.3 Strategy element 3: Evaluate and monitor service performance and outcomes

Service delivery does not stop once the product or service has been delivered. User outreach and engagement must continue to ensure that services are received and acted upon and that full benefit is achieved by the user. NMHSs should have a core set of metrics to measure the end-to-end-to-end service delivery process and its outputs. Each metric should only measure a specific aspect of the process but collectively, the metrics should enable an organization to demonstrate its strengths and identify areas for improvement in terms of effectiveness, efficiency, impact, satisfaction and value to its stakeholders, customers, users, partners and employees. More specifically, metrics should be:

- **Specific:** precisely targeted to the area being measured. For example, a good metric for customer satisfaction would be direct feedback from customers on how they feel about a service or product. A poorer metric would be the number of customer complaints because it is not specific nor directly correlated with customer satisfaction and can therefore be misleading;
- **Measurable:** able to collect data that are accurate and complete;
- **Actionable:** easy to understand, interpret and act upon;
- **Relevant:** measures only things that are important and relevant to an organization's goals and objectives. A common mistake is to measure everything, which is time consuming and produces meaningless results;
- **Timely:** metric data can be collected when it is needed;
- **Agreed upon:** externally-based metrics should be agreed upon by the NMHSs and customers, users or partners. As discussed under strategy element 1, agreeing on acceptable levels of performance is part of the evaluation of user needs or the fit-for-purpose assessment;
- **Owned:** should have clearly identified owners. Ideally, these owners should have the ability, influence and resources to take action to ensure that targets are met;
- **Consistent:** any two given metrics should not promote conflicting behaviours.

The following are examples of the types of metrics that are important for evaluating and monitoring service performance.

Forecast accuracy

A service-oriented culture requires the use of accuracy measures from the user's perspective, which differ from some of the accuracy measures widely applied within the Numerical Weather Prediction (NWP) community. A service-oriented organization should use forecast parameters that have a direct impact on the users' activities and operations. Accuracy measures of warnings and temperature predictions are good examples of service-oriented accuracy metrics. Specific examples currently in use include:

- The rolling average of the percentage of maximum and minimum temperature forecasts for today and tomorrow lying within 2°C of actual values;
- The storm-based tornado false alarm rate.

Customer satisfaction

User engagement is at the heart of a service delivery culture, and measuring customer or user satisfaction is both necessary and hugely useful in assessing performance and areas for future development.

User surveys are already in widespread and regular use within WMO. Surveys may have several levels of formality, scope and standardization, ranging from frequent customer liaison visits or user workshops to bulk information gathering exercises using standardized surveys via e-mail, the Web or by telephone. Both formal and informal methods for gathering user feedback are appropriate and useful. Surveys may be conducted at routine intervals or following a significant weather event. Satisfaction is often situational (environmental or economic) or influenced by public or media perceptions. These external factors can be minimized by using large and representative samples, longer periods of investigation or multiple events. Small-scale and highly-specific customer survey results are best used alongside larger survey results from which statistically valid conclusions can be more easily drawn. Further, customer satisfaction results can prove important when viewed alongside accuracy metrics, highlighting differences between customer perception and technical performance. Specific examples currently in use include:

- Telephone customer satisfaction surveys conducted immediately after a severe weather event has occurred or has been forecast;
- Yearly assessment of customer satisfaction, measured on an external benchmarking scheme by an external assessor of public-sector organizations;
- Annual mail surveys on the quality of web services, sent to external users.

Customer service

Customer service metrics are related to customer satisfaction, but generally deal with monitoring the effectiveness of the processes designed to allow continuous feedback, rather than the content of the feedback itself. They can also be used to measure various aspects of the contract between NMHSs and their customers. Customer service metrics of these types tend to be well defined and can be simple to formulate, at least initially. However, regular checks for relevance should be made and the targets may need to be finely tuned to ensure that they are realistic. Specific examples currently in use include:

- Respond to all correspondence within a maximum of five working days, and politely answer all telephone calls within a maximum of two minutes;
- Answer 95 per cent or more of the annual average of complaints within 28 days;
- Answer 85 per cent or more of the annual average of calls within 20 seconds.

Compliance, timeliness and resilience

Metrics of this kind are designed to measure the details of service quality that are not dealt with in conventional measures such as accuracy. These metrics may measure user requirements, mandates or internal requirements for producing and disseminating data and information. Specific examples currently in use include:

- All of Australia's national tsunami bulletins issued from the Joint Australian Tsunami Warning Centre are available to emergency services and the public within 40 minutes of a significant event in the Pacific or Indian Ocean;
- Monthly measurements of the percentage of METAR and TAF bulletins issued on time.

Reach

Effective services must be available, timely and useful. Measuring the reach of these services will indicate how well NMHSs deliver products and services that users are aware of and can access. PWS programmes, for instance, have traditionally relied on spreading information to the wider public via the media – usually television and radio. It is necessary to measure the effectiveness, or reach, of this method of communication, but it is just as important to examine the growing importance of other media, such as the Web, mobile applications and social networks. Specific examples currently in use include:

- The percentage of telephone survey responders who confirmed having seen or heard a warning for a specific severe weather event;
- The number of referrals to the website from external sites;
- The ability to maintain full functionality of the public website over 99.5 per cent of the time (three-month rolling average).

Impact

Measuring forecast accuracy, timeliness and reach do not tell the complete story of service delivery effectiveness. Examining the impact of a product or service, often measured in terms of societal or economic impact, indicates what kind of value or benefit has been received. It tells NMHSs whether or not their products and services are useful and relevant. Measuring impact may require a significant cultural shift within an organization because it typically uses more subjective methods based on social science. Effective impact metrics should be based on input and collaboration from users and partners, including social scientists such as economists and sociologists, who have expertise in measuring social and economic impacts and human behaviour. Specific examples currently in use include:

- The decrease in weather-related aviation delays;
- The cost avoidance from unnecessary evacuations.

Internal processes

Good service delivery is reliant on insight into the organization's internal processes. Effective and efficient internal processes directly impact the quality of service delivery, the value of products and services and the cost effectiveness of an organization's day-to-day operations. The measurement of

WORKING WITH USERS – KENYA METEOROLOGICAL DEPARTMENT

Through its PWS division, the Kenya Meteorological Department (KMD) serves the general public and a cross-section of specialized users including the media, the disaster community and the agricultural, energy and health sector. In order to serve these users effectively, it has taken steps to understand their specific needs and organize its service delivery operations to respond optimally to such needs. It has accomplished this by conducting user surveys, increasing interaction with users in training workshops and by organizing meetings of multidisciplinary teams created to improve service delivery.

Over the years, the scope of user groups has expanded and the demand for new products has increased. A good example is a recent request by the Kenya National Examination Council for monthly weather forecasts and weekly updates to help them with the logistics of transporting examination papers to remote places using roads that could quickly be rendered impassable by heavy rains. New methods of weather dissemination have evolved too, such as the RAdio InterNET (RANET) community radio stations, serving areas that are highly prone to extreme weather such as flooding and drought. Community radios have been very effective in issuing warnings and forecasts in local languages.

KMD has also focused on public education and outreach through activities such as radio and television discussion programmes and organizing school visits to KMD facilities in order to prepare the public on how to respond adequately to warnings.

an organization's internal processes should be driven largely by the QMS used and the key processes defined therein. Specific examples currently in use include:

- Internal and external audits to review the ISO 9000 series of QMS standards;
- Periodic reviews of research activities by an external committee from the research community.

Milestones

Milestones are also an internal metric often associated with project and programme management. Milestones measure the delivery of a product, service or system, or the completion of a phase or step in the delivery of a product, service or system. They should refer to specific activities occurring within the year, with new milestones defined and agreed for the new review period. Examples include:

- Provide location-specific observations, weather hazards and forecasts in local languages by end of the fiscal year;
- Begin deployment of next generation radar capability in quarter XX of fiscal year YY.

Key activities



Once measures are collectively identified and a methodology defined for how data will be gathered, NMHSs should collect baseline performance data. Baseline data inform both providers and users of current ability and capacity and serve as input when determining reasonable but challenging targets for future performance. Performance measurement data should be collected and reviewed at regular intervals by everyone in the value chain. NMHSs should use these data to reward and promote success, as well as to modify the service delivery process if performance is not meeting targets.

Any performance monitoring system must be carefully designed in order to minimize the number of metrics as much as possible and to select metrics that provide the best measurement of service-related outcomes. This is rarely a simple process and will yield better results if the metrics are stable over a reasonably long period. Before implementing a system of performance metrics, Members are encouraged to review the experiences of Members who have already carried out such monitoring.

4.4 Strategy element 4: Sustain improved service delivery

Service delivery should continuously adapt to changing users, user demands, user capacity and external drivers such as new technologies or advances in science. For example, if the aviation sector improves its ability to avoid weather systems, thus becoming more weather resilient, the original services to the aviation sector must evolve accordingly. Likewise, if a sector becomes more weather sensitive, such as the energy sector, then the services should also reflect that evolution. Evolution of services may also mean that a specific product or service should be retired because it is no longer required by the user, or can be provided more efficiently and effectively by another provider.

Key activities



The role of NMHSs is to ensure that users are able to fully benefit from the services by promoting, facilitating and coordinating improvements in interdisciplinary research, observing networks, modelling and technology. NMHSs should keep users informed of new opportunities and advancements – first to validate that user needs continue to be met, but also to increase user knowledge. This can be achieved through various education, outreach and communication activities and should be part of the ongoing user engagement described in strategy element 1. NMHSs also have a role in institutionalizing service delivery processes internally and among partners to achieve and maintain service excellence. The application of a QMS is an effective tool for institutionalizing processes.

4.5 Strategy element 5: Develop skills needed to sustain service delivery

To achieve the elements above and succeed in user-focused service delivery, NMHSs must identify and develop the required capacity. The WMO Secretariat should also identify and develop the ability to facilitate and support service delivery. Capacity includes developing the necessary skills, processes and technologies that enable, support and sustain a service-oriented culture. Much of this Strategy has already described needed processes and tools that will lead to better service delivery. Cross-cutting across the entire Strategy and critical to its success is the development and enhancement of workforce skills.

Key activities



Efforts should be made to identify the necessary skills relevant to an organization's operating model and objectives, and to conduct a gap analysis to discover what skills are lacking and how those gaps can be bridged through a combination of training, employee development and recruiting. The WMO Secretariat, in collaboration with the relevant technical commissions, is engaged in identifying requirements for specific competencies within NMHSs and the associated education and training needs for service delivery tasks. NMHSs must ensure that their workforce has the necessary mix of technical skills to meet societal demands and user needs. Additionally, NMHSs need skills that lead to effective service delivery. Such skills include, but are not limited to, communication, customer service, management, problem solving and performance management.

4.6 Strategy element 6: Share best practices and knowledge

A second cross-cutting strategy that will lead to a service-oriented culture is the sharing and applying of best practices and knowledge across WMO – a strategy already highlighted earlier in this document. The WMO Secretariat should facilitate the sharing of practices, approaches and tools. What works in one country may not meet user needs in another, but service delivery is a collaborative process where providers, partners, suppliers and users can all learn from one another.

NEW TECHNOLOGIES IN THE SERVICE OF USERS

The Hong Kong Observatory (HKO) upgraded its service delivery by implementing mobile platform and social networking services in 2010. The HKO developed a smartphone application named MyObservatory to take advantage of the smartphone's communication capability and its geo-positioning function. In addition to providing weather forecasts and warnings, MyObservatory automatically provides the latest location-specific weather conditions, such as temperature and wind, and weather photos from the weather stations closest to the user. MyObservatory proved hugely popular and was at the top of free download lists for months. HKO also began experimenting with social networking services in 2010 by launching a Twitter service (<http://twitter.com/hkobobservatory>) to issue weather warnings and disseminate information. The number of HKO Twitter "followers" grew from a few hundred to thousands in a couple of months and continues to increase. By evolving their service delivery methods to meet changing user demands and expectations, HKO found new, cost-effective ways to reach a greater number of people.

DEVELOPING SKILLS TO SUSTAIN SERVICE DELIVERY

The China Meteorological Administration (CMA) has made every effort to cultivate a culture of service delivery by transforming an operationally based system into a service oriented one. It has focused on team building, interdisciplinary research, outreach, applying new technologies and using social resources in service delivery, and taken special measures to encourage employees to communicate more effectively with users. The CMA was authorized by the central government to host a number of yearly training courses on disaster prevention and mitigation with the participation of city mayors from all around the country. It also regularly trains voluntary deliverers of weather information at grassroots level. A specific example is the township leader training programme, which was initiated as a pilot project in 2010.

APPROACH TO SERVICE DELIVERY IMPLEMENTATION IN THE TAJIK HYDROMETEOROLOGICAL SERVICE

As part of the modernization of the Tajik Hydrometeorological Service, specific investments are being made to enhance service delivery. Tajik Hydromet recognizes the importance of service delivery as an element of modern meteorological service. The nascent sectors have new and emerging needs for meteorological services and in many cases, it is important for the staff of NMHSs to have sufficient training in the user sector to be able to communicate effectively with those clients, resulting in a more collaborative approach to service delivery. The approach taken by Tajik Hydromet is to invest in training for both the Tajik Hydromet staff and the technical personnel from the weather-sensitive sectors in line with the four stages of the service delivery system.

In Tajikistan, the most important users are the energy sector, agricultural sector and disaster reduction services. Under this approach, for example, staff of the Emergency Management Committee (EMERCOM) local divisions will receive meteorological training on how to raise awareness of weather hazards and make better use of hydrometeorological information in EMERCOM operational activities. The training will enhance the capacity of EMERCOM to disseminate hydrometeorological information on severe weather conditions to the regional and local branches of the Committee and to zone the country based on the probability of occurrence of hazardous hydrometeorological events.

CHAPTER 5: IMPLEMENTATION APPROACH

Implementing this Strategy requires more detailed action plans for developing the processes, methodologies and tools needed to carry out each of the strategy elements mentioned above.

The degree of maturity and formality of service delivery among NMHSs varies significantly. Further, NMHSs operate differently due to a combination of internal and environmental factors. For example:

- Some NMHSs are completely government owned and offer services only to other government areas and the public. Some are fully privatized and offer commercial services. Many lie somewhere in between;
- Some NMHSs act as data suppliers to private forecast providers, while some undertake fully commercial operations in direct competition with these private organizations. Some play both roles;
- Some NMHSs use their own NWP models and forecasting and production systems. Others use those supplied by external organizations;
- Most NMHSs only provide services to their own country, but some may offer their services outside of national boundaries.

The bottom line is that a one-size-fits-all implementation approach will not be effective. Members need flexibility to develop their own unique approaches. How to implement this Strategy within NMHSs will depend on service priorities as well as current service delivery capacity.

One possible approach is to develop implementation plans that focus on creating, growing or sustaining a service delivery culture based on the current capacity level of NMHSs. The idea of creating a service delivery culture may at first seem overwhelming to some NMHSs and so they may wish to start incrementally by focusing on a particular service area that is an organizational or governmental priority. NMHSs may want to work with the WMO Secretariat to identify and implement service delivery pilot projects that can easily demonstrate value and be replicated across other service areas, or even by other NMHSs.

Additionally, WMO Members should seek opportunities to transfer knowledge through advanced capacity-building approaches, such as engaging in regional partnerships and documenting best practices. All implementation approaches and plans should factor in QMS practices and processes.



PART II. THE IMPLEMENTATION PLAN FOR THE STRATEGY

CHAPTER 1: INTRODUCTION

1.1 Background

WMO Members recognize the importance of providing high-quality delivery for all products and services and the need for guidance on how to improve this task. WMO facilitates international coordination, sets standards for meteorological and hydrological products and provides guidance on service delivery. While some great success has been achieved in this regard, Members have agreed that a more uniform and structured approach to service development and delivery is required. As a result, the WMO Strategy for Service Delivery (the Strategy) was approved at the sixteenth session of the World Meteorological Congress (May–June 2011) and the Secretary-General was requested to arrange for the preparation of an implementation plan to assist Members in adapting and applying the Strategy to their own service delivery strategies and plans.¹ The Implementation Plan for the Strategy was subsequently prepared under the guidance of the Executive Council Working Group on Service Delivery (ECWG-SD) and was approved by the Executive Council at its sixty-fifth session (May 2013).

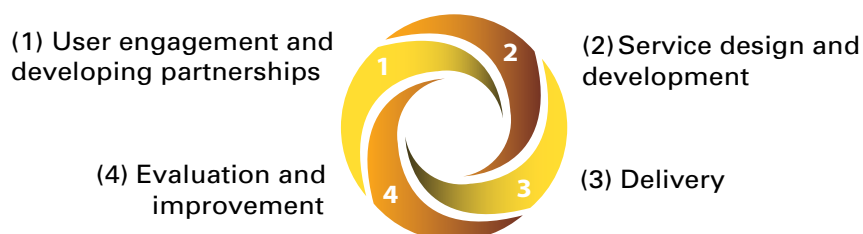
The Strategy lays the groundwork for Members to improve service delivery by sharing best practices, supporting mutually agreed upon guidelines and increasing user engagement throughout the delivery process. At the same time, it recognizes the many differences in the cultures, structures, operational practices and resource and development levels of WMO Members and their service providers.

The objective of the Implementation Plan is to guide WMO constituent bodies and Members in realizing the goal of the Strategy, thereby improving service delivery to users. This is expected to result in an increased uptake and use of products and services, leading to greater user satisfaction, growth in the products and services provided and increased socio-economic benefits.

The WMO ECWG-SD is ultimately responsible for overseeing the Strategy and has been tasked with monitoring its implementation.²

The Strategy describes four stages that define the continuous, cyclic process for service delivery, and identifies six elements that detail the activities required for high-quality service delivery.

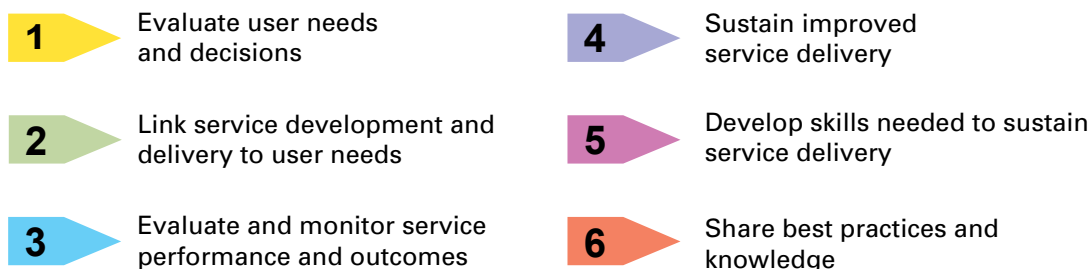
The four stages of a continuous, cyclic process for developing and delivering services are:



¹ World Meteorological Organization, 2011: *Abridged Final Report with Resolutions of the Sixteenth World Meteorological Congress* (WMO-No. 1077), Geneva. (https://googledrive.com/host/0BwdvoC9AeWjUazhkNTdXR XUz OEU/wmo_1077_en.pdf)

² World Meteorological Organization, 2012: *Abridged Final Report with Resolutions of the Sixty-fourth Session of the Executive Council* (WMO-No. 1092), Geneva. (http://library.wmo.int/pmb_ged/wmo_1092_en-p1.pdf)

The six elements necessary for moving towards a more service-oriented culture are:



Each stage and element is described in detail in the Strategy, which is considered as essential reading in order to understand the Implementation Plan.

1.2 Purpose of the Implementation Plan

It is widely recognized that great advances have been made in meteorology, climatology and hydrology due to the greater quality and volume of observational data and improvements in numerical prediction. However, it is less apparent how the benefits from these advances have led to improved products and services for users.

A main purpose of the Strategy is to ensure that users in various sectors make full use of the services provided by Members. The Implementation Plan for the Strategy was consequently developed to assist service providers in enhancing the quality and usefulness of meteorological and hydrological services, so that users may fully benefit from these advances.

To reach this goal, the Implementation Plan outlines an approach that advises National Meteorological and Hydrological Services (NMHSs) on how to convert the growing awareness of the importance of high-quality service delivery into action. The Service Delivery Progress Model (SDPM), presented in Appendix 1, is therefore a key component of the Plan, as it serves as a tool to assess the current level of service delivery and to find ways of improving it in a cost-effective manner. By comparing their current service delivery level against those described in the model, NMHSs will be able to identify the actions and activities required to move from their current level to the next.

The Implementation Plan also gives WMO constituent bodies the responsibility of initiating, supporting and monitoring the progress of Members in improving the quality of their service delivery.

1.3 Benefits derived from improved service delivery

As noted in 1.2, much progress needs to be made in translating the full benefits of the advances in meteorology, hydrology and related technologies into services that meet user needs. That being said, the link between improved levels of service delivery and the resulting benefits for users is being recognized. For example, one obvious benefit of improved severe weather warnings is that it will minimize the risk to people's lives and reduce the adverse impacts on the economy. Usable, understandable and relevant services will benefit many weather-sensitive social and economic sectors, such as health, agriculture, water resource management, transport, tourism and energy, by enabling them to make more informed decisions. Surveys of users can be conducted to identify the benefits that they derive from the service provided and to determine how to maximize those benefits through improved service delivery.^{3,4}

As a result of improved service delivery, users will gain confidence in the capability of NMHSs, which will lead to improved relations and increased demands for services. In addition, better services to government agencies and departments will result in greater recognition of NMHSs as providers of vital services supporting the economy and society. This will enable NMHSs to build a more convincing case for investment to sustain and further improve the range and quality of services.

As the Strategy is implemented by Members with assistance from WMO constituent bodies, more examples of successful user experience and derived benefits will become available and should be included in the reporting process.

³ *Proceedings of the WMO Regional Association VI (Europe) Conference on Social and Economic Benefits of Weather, Climate and Water Services* (PWS-23/ROE-1 (2012)), Lucerne, Switzerland. (http://www.wmo.int/pages/prog/amp/pwsp/documents/PWS_23_ROE-1_en.pdf)

⁴ *WMO Initiatives in Socio-Economic Benefits of Weather, Climate and Water Services* [web page]. (<http://www.wmo.int/pages/prog/amp/pwsp/SocioEconomicMainPage.htm>)

The distinction between a user and a customer

For the purpose of clarity, a distinction is made in the Implementation Plan between a user and a customer. As noted in the glossary, a user is the person or organization that receives the product or service and bases his or her decisions on it. A customer is the person or organization that pays for the product or service and agrees on the specifications for delivery through a customer-supplier agreement (CSA) or a service-level agreement (SLA). For example:

- A member of the public may receive a tropical cyclone warning and proceed to prepare his or her house to withstand high winds and heavy rain. The warning is available free-of-charge to the public to enable them to take action. The people who use this service are users of the warning because they do not pay directly for the service. The customer is the person or organization that pays for the warning service and specifies how it will be provided. In this case, the customer is the government that specifies the type of warning services it will pay the service provider to provide;
- A government department responsible for national defence may make an agreement with the service provider regarding the level of support from NMHSs required for the national air force. The defence department is a customer because it pays for the service and decides with the service provider what will be delivered and how. In this example, the users are the air force pilots who receive the service and base their operational decisions on it.

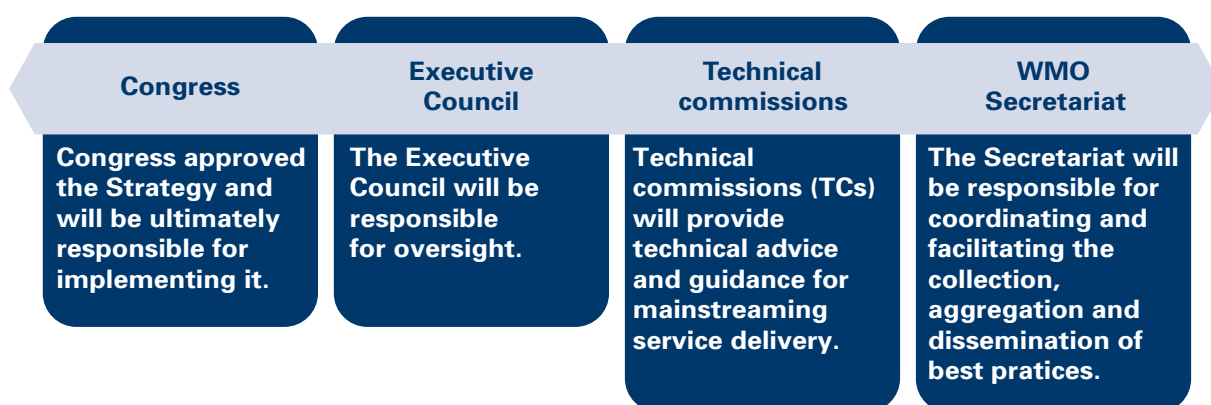
It is possible for the same person or organization to be both a user and a customer. For example, a farmer requiring a specific weather forecast for crop spraying or harvesting that is not provided as a public weather service may instead purchase the forecast from a commercial provider. This farmer then becomes both the user and customer of the service rendered.

CHAPTER 2: IMPLEMENTATION APPROACH

The approach to implementing the Strategy is separated into three different levels: global, regional and national.

2.1 At global level

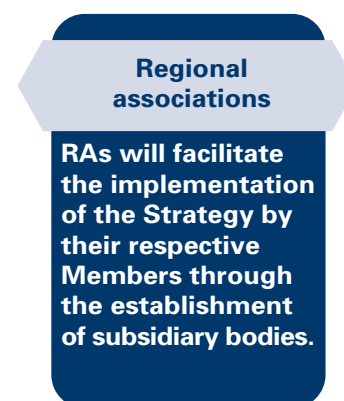
At global level, responsibility for the Strategy falls under the mandates of the following bodies:



More specifically, on behalf of the Executive Council, the ECWG-SD will define the means by which WMO is to guide Members and WMO constituent bodies in the implementation of the Strategy. It will also monitor, track progress and report to the Executive Council.

2.2 At regional level

At regional level, responsibility for the Strategy rests with the regional associations (RAs), who should treat service delivery as a main priority. RAs are expected to facilitate the implementation of the Strategy by their respective Members through the establishment of subsidiary bodies, such as regional working groups or expert teams, to address specific aspects of service delivery improvement. This could involve conducting socio-economic studies and evaluations, improving media relations, designing and implementing pilot and demonstration projects and establishing twinning mechanisms either intra- or inter-regionally to assist less developed Regions or subregions, with emphasis on least developed countries.



2.3 At national level

There are many differences in the structures and operating models of Members' NMHSs in terms of both the types of meteorological and hydrological services they provide and the users they support. The implementation approach has been developed in such a way that it can be adapted and applied by all Members and their NMHSs, regardless of their operating model. A three-step process is proposed in the SDPM: (i) determine the current service delivery level of NMHSs; (ii) define where they wish to be in the future; and (iii) develop tactics to get there.

To help illustrate how service delivery could be improved, examples of different levels of service delivery and lessons learned are provided in Appendix 5.



2.4 The Service Delivery Progress Model

A key component of the Implementation Plan is the SDPM (Appendix 1), which deals with implementing the Strategy at national level. It describes the activities, actions and behaviours expected of NMHSs with a particular level of service delivery development defined according to each of the six elements of the Strategy. The SDPM defines five possible levels of service delivery capabilities: (1) Undeveloped; (2) Development started; (3) Development in progress; (4) Developed; and (5) Advanced.

The SDPM also includes a number of questions and answers associated with each element of the Strategy that will help NMHSs to determine their current level of service delivery capability and identify the types of activities, actions and behaviours that will enable them to move to a higher level.

Assessing the performance of NMHSs against the SDPM could be undertaken by the NMHSs themselves, by other NMHSs in a twinning role or by some other external body. NMHSs should also ask key users and customers about their level of satisfaction, to help them decide what level of service delivery development is appropriate for the future.

2.5 Advancing to higher levels of service delivery

For each of the six elements outlined on page 33, the SDPM also provides detailed explanations of actions that can be taken by NMHSs to advance their service delivery performance and, in so doing, progress through the levels of the SDPM (see Appendix 2).

CHAPTER 3: IMPLEMENTING THE STRATEGY AT NATIONAL LEVEL

This part of the Implementation Plan lays out an approach to be applied by service providers at national level, with particular focus on NMHSs. Given that all NMHSs are different to a certain extent, it is not easy to recommend a simple model that will be clear and fully applicable to all. The Strategy recognizes that there is no definitive way to provide services to users. Nevertheless, the following steps are intended to help NMHSs to review their current service delivery practices and start implementing the Strategy.

Service providers

In the Implementation Plan, the term NMHS is used as a generic term for all national authorities that provide meteorological and/or hydrological services. It is recognized that in particular areas of meteorology and hydrology, other entities could, through a commercial contractor or a mandate issued by the government, provide public good services.

3.1 Steps to implement improved service delivery



Step 1 – Identify a service delivery champion⁵

Deciding to improve service delivery may require the personnel of NMHSs to undergo a cultural change. All staff members should recognize that they are making a contribution to a service, and that the needs of the user receiving that service must be understood and considered at all times. Linked to this cultural change is a fundamental need to shift from a focus on internal processes to one where meeting the needs of users is the key objective. The cultural change will only succeed if it is led and driven through the NMHSs by their leaders – hence the need to appoint a service delivery champion. The service delivery champion, who should be a respected senior manager, will need to articulate the benefits of improved service delivery across the NMHSs and to key stakeholders such as those in government, whose commitment will be essential to secure the necessary investment to improve service delivery. Staff members of NMHSs are likely to become more motivated when they see the value users have gained from their use of high-quality meteorological and hydrological services.

⁵ See glossary for definition (Appendix 3)

Step 2 – Assess the current level of service delivery using the Service Delivery Progress Model

Assessing the current service delivery level will be best achieved by systematically reviewing all current practices against the definitions provided in the SDPM. Evidence should be sought to justify the level chosen. Twinning with other NMHSs could be an effective approach to ensure an objective analysis. The assessment should be documented in a report that describes the state of development of NMHSs for each element, including an answer to each question posed in the SDPM, with specific evidence provided wherever possible.

Step 3 – Create an action plan with short-, medium- and long-term goals

Making the necessary changes to improve service delivery within NMHSs requires a structured approach, laid out in a clearly articulated action plan (see Appendix 7) that includes milestones and identifies the appropriate level of resources. Separating these changes into projects or programmes makes it easier to fully analyse, understand and manage the impact that each change will have on the efficiency of internal processes and on users. Each change can then be linked to achieving the desired outcome. As more significant changes are made, staff with specialist skills in project or programme management may be required to take over the task of implementing the change.

Some of these changes may be implemented quickly with only limited effort. Examples include modifying the formats of products, using simpler language and avoiding jargon or changing the time of the broadcasts based on feedback from user surveys. Other changes may require a series of actions over medium or long timescales, so it is important that they are documented and tracked through to completion. Milestones for the implementation of the Strategy can be set for the short term (2 years), medium term (6 years) and long term (10 years).

Key deliverables resulting from the implementation of the Strategy over the short term will include: an assessment of the current level of service delivery; putting in place the necessary action plan to start improving the service delivery level, which should include strengthening user interaction through, for example, surveys, focus groups or workshops for each user group and; an assessment of the resources required to implement the action plan. Over the medium term, the Implementation Plan aims to help a certain percentage of Members gain at least one level in their service delivery development and to document the process and share lessons learned with other Members. Over the long term, the aim of the Strategy is to develop or strengthen a service culture and facilitate the mainstreaming of service delivery in the programmes and activities of Members' service providers, resulting in a tangible improvement in the user's perception of their services.

Step 4 – Allocate resources to implement the agreed actions

It is clear that improving levels of service delivery will require effort and resources. This may be difficult for some NMHSs located in areas where there is great pressure on existing resources. However, once the benefits that can result from improved service delivery start to be recognized, NMHSs may be more inclined to make it a priority to reallocate resources for this purpose.

The specific resources required for achieving a defined level of service (in terms of quality, range, accuracy, timeliness, detail and delivery method) need to be assessed very carefully and measured objectively against the expected benefits for the customer and user. Many examples exist of

cost-benefit analyses in which estimates of achievable user benefits clearly exceeded the resources required for planning, implementing and providing the services over a foreseeable time period.⁶ This is another area where establishing twinning partnerships between developed and less-developed NMHSs could help the latter to apply such analyses. However, if this proves difficult, suitable adjustments will need to be made to the service level, in consultation with users.

NMHSs with a high level of service delivery will have dedicated staff responsible for ensuring that all the stages and elements of the Strategy are addressed. This may not be possible for NMHSs in the early stages of service delivery development, but the SDPM can be adapted to allow NMHSs to focus only on stages or elements where improving service delivery is most critical and where benefits can be quickly delivered. This may help to minimize the resources required in the early stages of development.

Finally, when the relationship with the customer involves a formal service agreement, it is advisable to ensure the availability of resources in accordance with step 4 before entering into such an agreement. Strict budgetary control and evaluation of the development of user benefits in line with development costs need to be maintained throughout the process. Customer commitment must also be assured to avoid wasted investment for services that may be discontinued by the customer down the line.

Step 5 – Review progress of activities against the action plan in conjunction with regular reviews of service delivery level

Continuous monitoring of progress against the action plan, clear internal financial accounting and regular meetings with the user/customer will ensure that the services developed are fit for purpose and, in the case of a formal service arrangement such as a memorandum of understanding (MOU),⁷ customer-supplier agreement⁷ or service-level agreement,⁷ that the services comply with the provisions stated in the agreement. This will also give the user confidence that their needs are being met and that they will get the service they expect. As part of the monitoring and evaluation process, appropriate key performance indicators need to be developed based on the SDPM and the detailed questions contained therein. Examples of such indicators could be the number of service agreements with user groups or the number of user satisfaction surveys carried out.

Step 6 – Share best practices and knowledge among NMHSs

The sharing of experience, knowledge and best practices among NMHSs with the assistance of WMO constituent bodies and the Secretariat can help to ensure that NMHSs are able to focus limited resources on areas which deliver maximum benefit. An example of sharing best practices and the subsequent action plan is provided in Appendix 7 to help illustrate the steps described above.

Step 7 – Report progress as recommended by the ECWG-SD

Monitoring and reporting on progress are essential for demonstrating the effectiveness of the resources being used to improve service delivery. The ECWG-SD will establish a reporting process to track the cumulative progress of WMO Members.

⁶ *Proceedings of the WMO Regional Association VI (Europe) Conference on Social and Economic Benefits of Weather, Climate and Water Services* (PWS-23/ROE-1 (2012)), Lucerne, Switzerland. (http://www.wmo.int/pages/prog/amp/pwsp/documents/PWS_23_ROE-1_en.pdf)

⁷ See glossary for definition (Appendix 3)

CHAPTER 4: ROLE OF WMO CONSTITUENT BODIES IN IMPLEMENTING THE STRATEGY

Although the Implementation Plan is intended to be simple to use, many Members may need assistance to achieve best possible results. As part of their coordinating and facilitating functions, RAs and TCs, with the assistance of the Secretariat, will certainly have a key role to play in helping and encouraging Members to implement the Strategy and improve their levels of service delivery.

4.1 Role of the Executive Council Working Group on Service Delivery

On behalf of the Executive Council, the ECWG-SD will be responsible for setting out the means by which WMO is to guide Members and WMO constituent bodies in the implementation of the Strategy. In addition, the ECWG-SD will monitor the progress of Members and provide annual reports to the Executive Council.

4.2 Role of regional associations and technical commissions

WMO constituent bodies already recognize the importance of high-quality service delivery as a means to sustain or even develop the potential of NMHSs. Experts and management groups of these bodies should participate in the development of recommendations on how Members can improve the value of their services. The Executive Council has requested TCs to ensure that the Strategy is integrated into all WMO programmes whose mandate includes service delivery.⁸

While there is no definitive way to do this, RAs and TCs will be expected to develop mechanisms that are fit for purpose in their areas of responsibility, including the identification of a service delivery champion to aid in communicating examples of best practice. TCs can each help to contextualize service delivery improvement within their area of technical expertise. For example, the Commission for Basic Systems could establish an expert team to document and share best service delivery practices for public weather services; the Commission for Hydrology could develop guidelines for excellence in the delivery of hydrologic services; the Commission for Climatology could ensure that service delivery practices are clearly expressed in the implementation plans for the Global Framework for Climate Services (GFCS) and the Commission for Aeronautical Meteorology, the Commission for Agricultural Meteorology and the Joint WMO/IOC Technical Commission for Oceanography and Marine Meteorology could each incorporate service delivery improvement initiatives into their workplans focused on providing services to the aviation, agricultural and marine sectors, respectively.

With regard to reporting procedures, it is important to avoid spending more time on the report than on the activity itself. However, some level of monitoring, evaluation and reporting will be required to demonstrate that the Strategy is being implemented, that improvements are being made and that benefits are being delivered and measured. The timetable for these activities will depend on the different requirements of Members, RAs and TCs, but it is recommended that reports be submitted at least once a year.

4.3 Role of the Secretariat

A number of WMO programmes have a service delivery dimension. The Secretariat departments that manage these programmes have a responsibility to promote the Strategy and advocate its

⁸ World Meteorological Organization, 2012: *Abridged Final Report with Resolutions of the Sixty-fourth Session of the Executive Council* (WMO-No. 1092), Geneva. (http://library.wmo.int/pmb_ged/wmo_1092_en-p1.pdf)

implementation through the activities (including training and capacity-development activities) of such programmes. Encouraging and supporting Members through these programmes (including the Regional Programme and the Education and Training Programme) will be essential to achieving the first expected result of the WMO Strategic Plan, which states as its goal: “Enhanced capabilities of Members to deliver and improve access to high-quality weather, climate, water and related environmental predictions, information, warnings and services in response to users’ needs, and to enable their use in decision-making by relevant societal sectors”.⁹

4.4 Assessment reports

As part of the short-term (two years) milestone of this Plan, the recommended first step for Members is to conduct an assessment of service delivery development so as to determine their current level, and to submit a report to the ECWG-SD describing their level and explaining whether plans and targets for further improvement have been established. The ECWG-SD will provide guidance on how to prepare such reports as the implementation of the Strategy is tested in a number of NMHSs.

The information contained in the assessment reports will be used by the ECWG-SD to track the implementation of the Strategy. Examples of factors that the ECWG-SD will monitor include:

- (a) The number of NMHSs that have conducted an initial review of their service delivery status;
- (b) The number of NMHSs that have developed an action plan to improve their level of service delivery;
- (c) The number of NMHSs that have improved their level of service delivery;
- (d) Examples of good practice that can be communicated more widely.

To ensure that as many reports as possible are submitted, RAs and TCs are expected to play a key role in encouraging and assisting Members in the preparation of their reports. This could be achieved by making one of the regional working groups or expert teams responsible for such a task and including it in their terms of reference.

For the implementation of the Strategy to be a success, the exchange of knowledge and information among NMHSs and WMO constituent bodies will be crucial. Timely and accurate reports to the ECWG-SD will help to ensure that relevant knowledge and information can be sent to other NMHSs and constituent bodies. RAs and TCs can also help to manage the flow of information and the exchange of knowledge and best practices. Twinning and mentoring will be important for achieving progress and RAs in particular will have a major role in facilitating these activities.

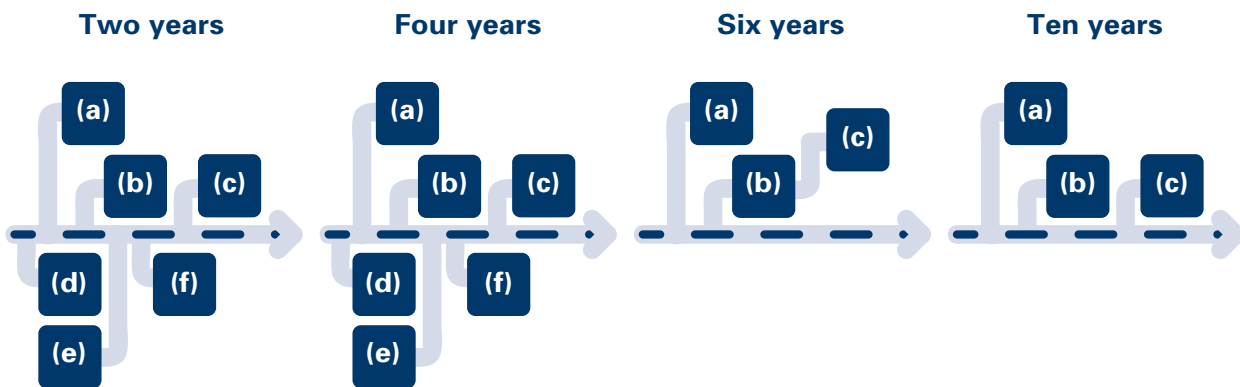
4.5 Milestones to measure progress of the Implementation Plan

The ultimate objective of the Implementation Plan is to improve service delivery levels within NMHSs through their implementation of the WMO Strategy for Service Delivery. In order to quantify the progress made towards achieving this objective, a number of targets and milestones are proposed.

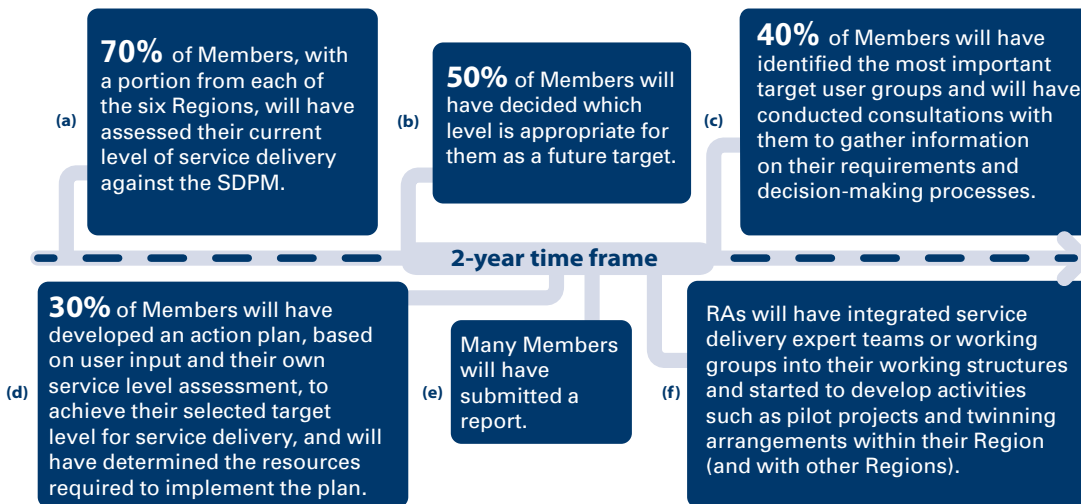
⁹ World Meteorological Organization, 2011: *WMO Strategic Plan 2012–2015* (WMO-No. 1069), Geneva. (http://www.wmo.int/pages/about/documents/1069_en.pdf)

4.5.1 The short-term (two-year) time frame

Within three months following the approval of the Implementation Plan, a questionnaire that will help Members assess their current level of service delivery will be developed and distributed. The results of the questionnaire will be analysed and form a baseline against which progress will be assessed. A second questionnaire will be administered two years after the approval of the Plan, at which point Members will be asked to submit an assessment report.



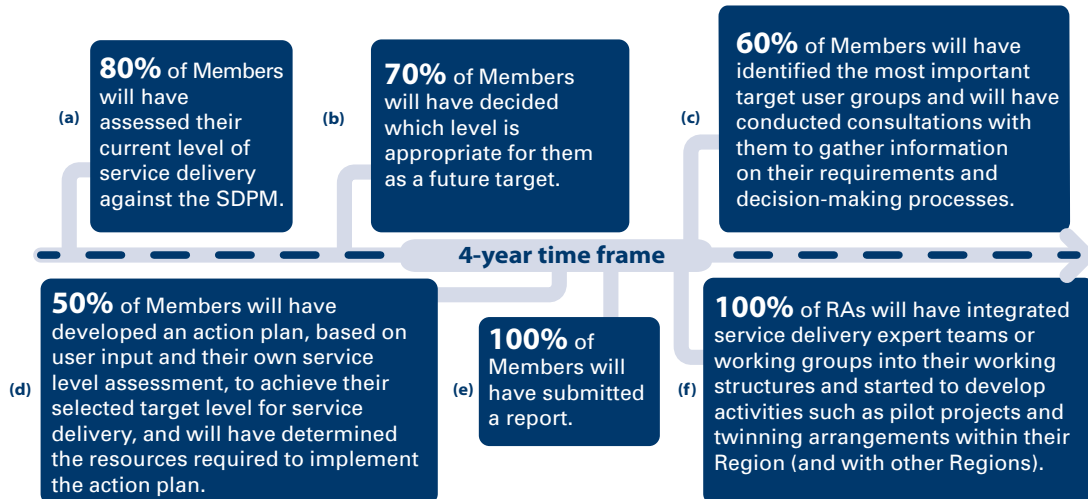
Over those first two years, it is expected that:



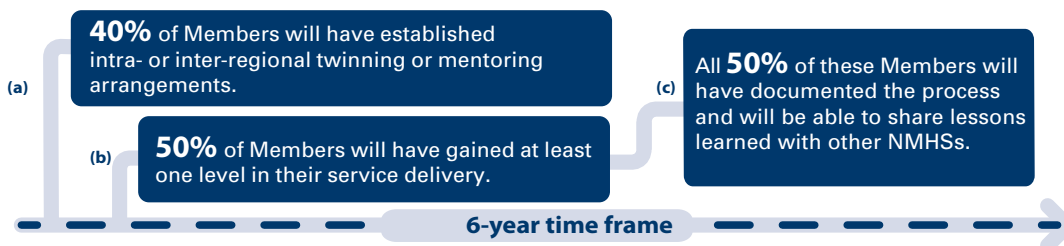
4.5.2 The medium-term (six-year) time frame

Every two years following the approval of the Implementation Plan, the ECWG-SD will administer a follow-up survey and request updates on the Members' assessment reports as a means to monitor progress.

By the end of four years, it is expected that:



After six years, it is expected that:



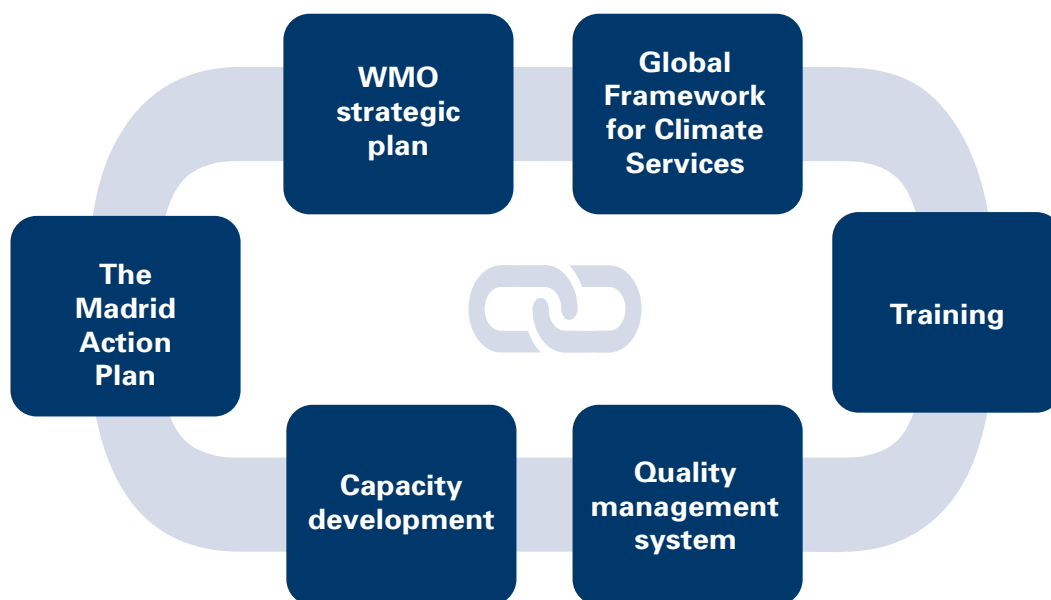
4.5.3 The long-term (10-year) time frame

The ECWG-SD will monitor progress over the long term through periodic and progressive questionnaires and requests for updated assessment reports. After ten years, it is expected that the implementation of the Strategy will have led to the development or strengthening of a service culture and facilitated the mainstreaming of service delivery in the programmes and activities of Members' service providers, resulting in a tangible improvement in the user's perception of their services.

Therefore, the aim over the long term is for:



CHAPTER 5: LINKAGES WITH OTHER INITIATIVES AND ACTIVITIES



5.1 Linkages with WMO initiatives and activities

Service delivery should not be seen as a separate programme activity within NMHSs but rather as a critical component of everything the NMHSs do. A culture of continuous improvement in service delivery benefits staff, the NMHSs and their customers, and thus positively impacts the perception of the NMHSs by the users of meteorological and hydrological services. The goal is to ensure that both NMHSs and the users will mutually benefit. The following are examples of WMO initiatives and activities that are closely linked to the Strategy.

5.2 Linkages with the WMO Strategic Plan

The WMO Strategy for Service Delivery stems from the WMO Strategic Plan and, in particular, the strategic thrust that focuses on improving service quality and service delivery. This strategic thrust recognizes the social benefits that can result from improvements in the quality and delivery of meteorological and related environmental services. It also emphasizes that “this will require collaborative efforts involving the providers and users of information to ensure that the needs of the users are integrated into the development of the products and to enhance feedback between the providers and users of information to make continuous improvements”.¹⁰ The expected result linked to this strategic thrust “addresses the rapidly changing paradigm for providing meteorological (weather and climate), hydrological and environmental services, which requires service providers to: (i) understand how the information is used so that it can be tailored to the users’ needs, for example through effective rolling reviews of client needs for products and services; and (ii) integrate weather, climate, water and environmental information and products into decision-making”.¹⁰

¹⁰ World Meteorological Organization, 2011: *WMO Strategic Plan 2012–2015* (WMO-No. 1069), Geneva. (http://www.wmo.int/pages/about/documents/1069_en.pdf)

5.3 Linkages with the Global Framework for Climate Services

The need for high-quality delivery is equally applicable to the development of climate services. The User Interface Platform (UIP), one of the five central pillars of the GFCS, recognizes the importance of user engagement. Participating in dialogue with users, obtaining feedback from them and developing monitoring and evaluation measures in order to meet user needs are all objectives that are closely aligned with the strategy elements. This parallel has been highlighted in the GFCS Implementation Plan, which recognizes the opportunity to enhance efficiency by aligning the UIP with the Strategy.¹¹

5.4 Linkages with the quality management system

A quality management system (QMS) is defined as the organizational structures, procedures, processes and resources needed to develop and successfully implement management of the organization's delivery of products and services.¹² Effective service delivery and compliance with QMS standards are complementary, and an organization with high service delivery standards will be well-positioned to meet the broader QMS standards. High-quality service delivery and compliance with QMS standards are both essential if NMHSs wish to improve their outcomes.

Over the last decade, a strong need has emerged for quality assurance, quality control and quality management practices in the provision of meteorological services for specific sectors. For example, the provision of meteorological services for safe, economic and efficient air navigation is carried out under a global regulatory framework jointly developed by the International Civil Aviation Organization (ICAO) and WMO. A properly organized QMS for meteorological information is now a required standard for all service providers within the sector. It should be noted that this requirement applies not only to meteorological service providers but also to all providers of air navigation services (such as aeronautical information services, airport ground services or air traffic control). The needs are thus industry-driven and NMHSs and other providers of meteorological services to aviation should implement a quality system that is in conformity with the ISO 9000 series of quality assurance standards. These standards are designed to help organizations ensure that they meet the needs of customers and other stakeholders while complying with statutory and regulatory requirements related to the product.

Other sectors are following the aviation example. Services in hydrology and marine transportation, for instance, might also start requiring QMS standards. The WMO Strategy for Service Delivery will help to ensure that the QMS principles are gradually introduced into all areas of services provided by NMHSs, bringing NMHSs closer to reaching the ISO 9000 family of standards for QMS. It is very encouraging to note that some NMHSs have already achieved ISO 9000 certification, not only for their aviation services but for the organization as a whole. Notwithstanding the investment (in terms of financial and human resources) needed to obtain and maintain the ISO certificate, the experience of these NMHSs has clearly had a very positive impact on the quality of services and management practices, as well as on the user/customer attitude and perception.

¹¹ Extraordinary session of the World Meteorological Congress, 2012: *Implementation Plan of the Global Framework for Climate Services* (WMO-No. 1102: Annex to Resolution 1), Geneva. (http://library.wmo.int/pmb_ged/wmo_1102_en-p1.pdf)

¹² World Meteorological Organization, 2013: *Guidelines for Implementing a Quality Management System in Hydrology*. (http://www.wmo.int/pages/prog/hwrp/qmf-h/documents/Doc_3_GuidelinesQualityManagementSystem_17092013.pdf)

A QMS should support the stages and elements of the Strategy and complement the SDPM as a guide to service delivery development. The WMO *Guide to the Implementation of a Quality Management System for National Meteorological and Hydrological Services*¹³ provides advice and information for all NMHSs who wish to adopt a quality management approach to the delivery of services. Twinning and mentoring have been recognized by WMO as effective methods for assisting Members requiring expertise, advice and assistance on how to implement a QMS. A similar twinning and mentoring framework should be established to enable NMHSs with well-developed service delivery to assist other NMHSs in improving their own service delivery levels. This should also encourage interaction in an informal manner or through bilateral visits and exchanges between NMHSs. It is expected that RAs will have a key role to play in establishing an effective framework for twinning and mentoring within and between the Regions.

5.5 Linkages to training

Training in all aspects of service delivery should be incorporated into relevant training events. For example, forecasting courses should include a module on service delivery to instruct students on the competencies and behaviours required for high-quality service delivery. Such training should also include information on the users of the forecast information, their decision-making processes and how they apply meteorological or hydrological information to such decisions. It is also highly recommended to train users and customers on how to derive the maximum benefit from those products and services and to ensure that they fully understand the capabilities of NMHSs.

5.6 Linkages to capacity development

Capacity-development activities often have the biggest impact when they focus on services and service delivery and take into account the infrastructure, human and institutional capacities required to enable the delivery of such services. NMHSs will be able to contribute more effectively to the development plans of their countries if the services they provide are designed with the needs of the user in mind. This will help to ensure that the services are valued by the users and that the meteorological and hydrological services are sustained and improved.

This approach is in line with the WMO Capacity Development Strategy,¹⁴ which aims to facilitate a holistic and integrated approach to sustaining capacity development in NMHSs, especially in developing countries, through: advocacy, education and training, outreach, partnerships and resource mobilization, demonstration and pilot projects, service delivery and research. The fact that the WMO Capacity Development Strategy focuses on improved quality in service delivery, rather than on the more traditional approach of enhancing meteorological infrastructure, has proved to be very successful in a number of countries. For example, several projects to install media weather presentation systems in African NMHSs immediately helped to raise the profile of the NMHSs with ministers and the public. A second example concerns the implementation of a severe weather forecasting demonstration project. In this case, making substantial efforts to improve service delivery based on investments in science and technology was shown to benefit the public through an increased lead time and higher accuracy of warnings. The WMO *Guidelines on the Role, Operation*

¹³ World Meteorological Organization, 2013: *Guide to the Implementation of a Quality Management System for National Meteorological and Hydrological Services* (WMO-No. 1100). (https://googledrive.com/host/0BwdvoC9AeWjUazhkNTdXR XUzOEU/wmo_1100_en.pdf)

¹⁴ WMO Capacity Development Strategy [web page]. (<http://www.wmo.int/pages/prog/dra/CDS.html>)

*and Management of National Meteorological or Hydrometeorological Services*¹⁵ focuses primarily on service delivery and points to many of the challenges faced by NMHSs, including meeting national needs for meteorological and related data and services. It should be kept in mind that a critical precondition for delivering effective services is the capacity of the underpinning operational structure of the NMHSs to provide accurate and timely products, based on sound scientific data.

5.7 Linkages with the Madrid Action Plan

The International Conference on Secure and Sustainable Living: Social and Economic Benefits of Weather, Climate and Water Services, was organized by WMO in Madrid, Spain in 2007. The purpose of the Conference included, among others, fostering increased awareness in both the current and potential user communities of the availability and value of the full range of existing, new and improved services, and initiating and promoting new approaches to the evaluation of the social and economic benefits of meteorological and related services in the research, education and applications communities. The Conference reiterated that one of the roles of NMHSs is to provide the information and services that enable governments and other stakeholders to minimize the costs of natural disasters, protect and strengthen the weather-, climate- and water-sensitive sectors of the economy and enhance people's health, welfare and quality of life. The result of the Conference, known as the Madrid Action Plan,¹⁶ clearly recognizes the need to be able to quantify the benefits obtained within the various socio-economic sectors supported by NMHSs, to enable NMHSs to strengthen their service delivery capacity.

¹⁵ World Meteorological Organization, 2013: *Guidelines on the Role, Operation and Management of National Meteorological or Hydrometeorological Services* (WMO-No.1112) [online guide]. (<https://www.wmo.int/pages/prog/dra/eguides/index.php/en/home>)

¹⁶ World Meteorological Organization, 2007: *Madrid Conference Statement and Action Plan*, as adopted by the International Conference on Secure and Sustainable Living: Social and Economic Benefits of Weather, Climate and Water Services. (http://www.wmo.int/pages/themes/wmoprod/documents/madrid07_ActionPlan_web_E.pdf)

CHAPTER 6: CLOSING REMARKS

The mainstreaming of the WMO Strategy for Service Delivery Implementation Plan represents an important milestone for strengthening the service orientation of NMHSs. The Plan describes practices that can strengthen service delivery across the entire WMO by providing a flexible methodology that is useful to NMHSs in both developed and developing countries. It provides decision-makers of NMHSs with the tools required to fully understand how their services are used in the decision-making processes of various socio-economic sectors and how to make them fit for purpose whether they be for public good or commercial gain. The first steps require a commitment from Members to evaluate their current level of service, to adapt the Plan to their needs and to interact closely with each other, their regional association and relevant WMO technical commissions as part of an overall QMS.

The ECWG-SD hopes that the management of NMHSs will find the Strategy and its Implementation Plan both informative and useful for furthering their national goals. The ECWG-SD is committed to helping facilitate the implementation of the Strategy and monitor its progress to measure achievement of higher levels of service over the next two to ten years. Raising the standards of service delivery is vital for the success of Members as service providers and their goal of enhancing the visibility of NMHSs and attracting new resources to strengthen their capacity.



PART III. APPENDICES

The page features a solid dark blue background. On the left side, there is a large, abstract graphic composed of several overlapping circles and curved shapes in various shades of blue, ranging from a very dark navy to a lighter, medium blue. The shapes overlap in a way that creates a sense of depth and movement, with some areas appearing darker due to the layering.

APPENDIX 1: SERVICE DELIVERY PROGRESS MODEL

This model can serve as a tool for assessing the level of development of NMHSs and creating an action plan to improve service delivery.

		Undeveloped	Development initiated	
Strategy element 1 Evaluate user needs and decisions		The users and their requirements for products or services are not known.	Users are known, but no process for user engagement exists. User requirements for service delivery are not well defined.	
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.				
Q1a	Who uses the products and services you deliver?	The users of the services and products are not known.	Some or all of the users are known, but this information is not recorded in a formal document.	
Q1b	What processes do you have in place for engaging with your users?	There are no processes in place for engaging with users.	No proactive engagement with users takes place. Users are able to contact NMHSs on an ad hoc basis, but no formal record of this is kept and action is rarely taken as a result.	
Q1c	How do your users contact you?	There is no mechanism for contact with users.	Mechanisms for user contact are in place, but are unreliable. For example, poor Internet access results in e-mails regularly going unanswered.	
Q1d	How are user requirements gathered and documented to facilitate the development of products and services?	User requirements have not been recorded or documented.	Users needs are somewhat understood, but they are not described in the form of user requirements and little detail is provided.	

	Development in progress	Developed	Advanced
	<p>Users are able to contact NMHSs and their feedback is recorded.</p> <p>There are some formal processes for integrating the feedback received into the development of services.</p> <p>User requirements are defined with limited documentation.</p>	<p>NMHSs seek input on an ad hoc basis from users to facilitate the development of services.</p> <p>Requirements are defined in documents agreed upon with the customer, but are not routinely updated.</p>	<p>An ongoing dialogue is maintained with users regarding their needs and the services they receive.</p> <p>Requirements are defined in documents agreed upon with the customer and routinely updated using feedback from users.</p>
<p>The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.</p>			
	<p>An MOU, CSA or SLA is in place with some users, but is often incomplete or out of date, and, as a result, unlikely to be used.</p>	<p>An MOU, CSA or SLA is in place for each user but is not routinely assessed and updated.</p>	<p>An MOU, CSA or SLA is in place for each user and is routinely assessed and updated as necessary to ensure that it contains current information. The information contained in the document is used to facilitate the development of products and services.</p>
	<p>Irregular proactive engagement is undertaken, which can be in the form of surveys or user workshops.</p>	<p>Regular workshops or other similar mechanisms are used to gain feedback from users on how services can be improved.</p> <p>A user feedback log is maintained and action to improve service delivery is taken.</p>	<p>Various mechanisms are used that are appropriate to the user community.</p> <p>Outcomes are communicated back to the users.</p>
	<p>Users are able to contact NMHSs using a variety of means including e-mail, telephone or post.</p>	<p>Users are encouraged to contact the NMHSs through a variety of means. User contact is managed on an ad hoc basis.</p>	<p>User contact is managed by a designated individual or team.</p>
	<p>An outline of user requirements has been recorded but documentation is limited.</p>	<p>Requirements are defined in documents agreed upon with the customer, but are not routinely updated.</p>	<p>Requirements are defined in documents agreed upon with the customer and are routinely updated using feedback from users.</p>

		Undeveloped	Development initiated	
Strategy element 2 Link service development and delivery to user needs		No concept of service exists, products are simply issued.	Services do not adapt to changing user needs and new technology. Products are documented with limited descriptive information.	
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.				
Q2a	What documentation do you maintain to define the products and services you deliver?	There is no documentation related to products or services.	Some information has been recorded for a small number of services and products in a document such as a work instruction document or SLA, but it is not routinely updated.	
Q2b	How are users kept informed when products and services are changed?	There is no mechanism for informing users when products and services are changed.	Some users are informed ahead of time on an ad hoc basis when products and services are changed.	
Strategy element 3 Evaluate and monitor service performance and outcomes		No measures are in place for assessing performance, either in terms of accuracy or service delivery.	Some measures of development are in place. The verification of accuracy and/or service delivery takes place, but no systematic process exists to use this information to improve the service.	
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.				
Q3a	How do you verify the accuracy, quality and effectiveness of the products and services you deliver to users?	No measures exist to assess the accuracy, quality or effectiveness of the products and services delivered.	Some measures are used in an ad hoc manner to determine the accuracy and timeliness of products and services.	
Q3b	How are the results of the verification of accuracy, quality and effectiveness of service delivery used to improve the products and services you deliver to your users?	There are no results as there are no measures.	Some results are recorded in an ad hoc manner or for internal purposes and may be used to improve some of the products and services delivered.	

	Development in progress	Developed	Advanced
	<p>Services are developed and changed as technology allows, but engagement with users is ad hoc.</p> <p>Products and services are documented and the information is used to inform management of changes.</p>	<p>User feedback is used to inform management of changes and developments to services.</p> <p>Products and services are consistently documented. SLAs are defined.</p>	<p>Users are consulted to facilitate development of products and services.</p> <p>The service defined in the SLA is agreed upon with the customer based on user consultation.</p>
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.			
	Information has been recorded for a small number of services and products in a document such as a work instruction document or SLA, which is routinely updated.	Information has been recorded for most services and products in a document such as a work instruction document or SLA, which is routinely updated.	All products and services are described in documents such as work instruction documents and SLAs that are routinely updated.
	All users are informed when the products and services they receive are changed.	A formal process is followed to ensure that users are well prepared for any changes to services and products they receive.	Users are involved in identifying new requirements and making changes to products and services, and new technologies are considered when changes are planned.
	Measures of verification and service delivery are in place but are not informed by user requirements.	<p>User requirements are used as data for performance measures.</p> <p>Findings are used to identify areas for improvement.</p> <p>Subsequent actions are taken in an ad hoc manner.</p>	Measures of performance are based on user needs, which are regularly reported and consistently used to inform decisions on improvements.
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.			
	<p>Some measures are used routinely to verify the accuracy and quality of service delivery.</p> <p>Some of these measures may be based on user requirements.</p>	<p>Measures are used to assess the accuracy, quality and effectiveness of service delivery based on user requirements.</p> <p>The measures are defined in the SLA.</p>	<p>Measures are routinely reviewed to reflect changes to user needs.</p> <p>The SLA is updated in line with changes.</p>
	Results are routinely recorded for some products and services and some analysis is undertaken.	Results are analysed to identify areas for improvement. Actions are taken in an ad hoc manner.	<p>Areas for improvement are documented and actions routinely taken.</p> <p>Plans are produced and progress against targets is routinely monitored.</p>

		Undeveloped	Development initiated	
Strategy element 4 Sustain improved service delivery		No concept exists of service delivery principles.	The concept of service delivery has been introduced and an assessment of current status has been undertaken.	
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.				
Q4a	Have you documented your service delivery processes?	No documentation to describe the service delivery process exists.	Some documentation to describe service delivery processes exists, but not in the format of a QMS.	
Q4b	How do you use developments in science and technology to improve service delivery?	Developments in science and technology are not reviewed.	Some developments in science and technology are identified but no plans exist to use them.	
Q4c	How do you communicate the changes in your service delivery process to your customers and users?	Changes are not communicated to customers or users.	Some changes are communicated but the impacts on customers or users are only sometimes considered.	

	Development in progress	Developed	Advanced
	An action plan has been created to improve the current level of service delivery and resources have been identified to implement it.	The action plan is being implemented to improve service delivery, the outcomes are being monitored.	<p>The status of service delivery is reviewed on a regular basis.</p> <p>The action plan evolves in response to the outcome of the reviews.</p>
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.			
	A QMS exists for most service delivery processes. Monitoring of compliance is ad hoc.	A QMS exists to cover all service delivery processes and compliance is monitored. Some actions are taken to improve processes.	A QMS exists and service delivery processes are continually improved taking into account feedback from staff, customers and users.
	Developments in science and technology are identified with some plans in place to use them.	Plans are routinely updated to benefit from developments in science and technology.	Developments in science and technology are embraced and plans are in place to exploit them.
	All changes in service delivery are communicated to customers or users as appropriate.	A formal communication process is followed to ensure that customers and users are well prepared for any changes in service delivery.	Customers and users routinely contribute to the development of service delivery processes and the subsequent communication of changes.

		Undeveloped	Development initiated	
Strategy element 5 Develop skills needed to sustain service delivery		No concept or communication of service delivery principles exist.	No formal training in service delivery is provided, though service delivery principles are informally communicated.	
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.				
Q5a	Who is the service delivery champion within your National Meteorological or Hydrometeorological Service (NMS)?	There is no service delivery champion within the NMS.	The process of identifying a service delivery champion has been started but is not yet complete.	
Q5b	What mechanisms are in place to enable your staff to be educated in the principles of service delivery?	There are no mechanisms in place.	Informal communication of service delivery principles takes place between staff and management.	
Q5c	What mechanisms are in place for documenting the roles of staff and their individual training requirements?	Staff do not have a job description document or training plan.	Most staff have a completed job description document, but there is no correlation between the two.	
Q5d	How do you involve staff in improving service delivery?	There is no mechanism for staff to provide suggestions on how to improve service delivery.	An informal process for staff suggestions exists but is rarely used.	
Strategy element 6 Share best practices and knowledge		<p>This activity is a key function of the WMO Secretariat programmes that have a role in service delivery with assistance from the Education and Training Programme.</p> <p>NMHSs are encouraged to share best practices in service delivery through formal training, twinning, mentoring and other methods.</p>		

	Development in progress	Developed	Advanced
	<p>Most members of NMHSs are aware of the importance of service delivery.</p> <p>Some formal training is provided.</p>	<p>All members of staff are fully aware.</p> <p>Formal training is provided. There is an ad hoc process for staff to offer ideas for improvements to service delivery.</p>	<p>There is a culture of providing best possible service delivery.</p> <p>Innovative ideas are routinely integrated into the continual service improvement process.</p>
The answers to the following questions will allow NMHSs to determine where their current service delivery processes lie on the SDPM.			
	A service delivery champion has been identified but does not have appropriate support from all levels of the NMS to make improvements to service delivery.	A service delivery champion has been identified but does not have all the appropriate resources to make improvements.	A service delivery champion at an appropriately senior level has been given the training, resources and mandate to make improvements in service delivery.
	<p>Mechanisms such as training workshops are regularly carried out for all staff and management.</p> <p>Available material on the subject is used.</p>	Regular communication and training, which is based on available material, takes place for all staff and management.	Ongoing training is carried out for all staff and there is regular communication between all levels of staff and management regarding service delivery.
	All staff have a job description document that is coherent and consistent across the NMS.	<p>Staff are assessed against their job description documents and areas for development are identified.</p> <p>Individual training plans are created based on development needs.</p>	<p>Training plans are reviewed to identify the training requirements of NMHSs.</p> <p>Training is provided using a variety of methods.</p>
	A process for staff suggestions exists. Implementation of suggestions is ad hoc.	Staff suggestions are encouraged and implemented as appropriate. Improvements to service delivery are communicated internally.	Staff suggestions are considered at a senior level and implemented as appropriate. Feedback is provided to staff on the impact of their suggestions.
<p>This activity is a key function of the WMO Secretariat programmes that have a role in service delivery with assistance from the Education and Training Programme.</p> <p>NMHSs are encouraged to share best practices in service delivery through formal training, twinning, mentoring and other methods.</p>			

APPENDIX 2: ACTING ON THE STRATEGY ELEMENTS

For each of the six elements of the Strategy, actions can be taken to improve levels of service delivery enabling the service provider to advance through the levels of the SDPM. Some of these actions are described in the following paragraphs, with greater detail provided in the SDPM.

Strategy element 1 – Evaluate user needs and decisions

As the first step in the service delivery process, it is vital to know who the users of meteorological and hydrological products or services are and to understand their relevant decision-making and planning processes. Getting to know the user will very much depend on the type of user, and different methods will need to be applied for each type. The media, disaster management agencies and humanitarian organizations can be defined as both users of the service and partners of NMHSs in the delivery of the service to other end-users and decision-makers. Socio-economic sectors such as agriculture, health, energy, transport and tourism form a different group of users who may provide the services and products of NMHSs to others either as a public good or as part of a commercial arrangement. The most diverse user group is the public. As a result, surveys are the most appropriate method for gathering information on the public's requirements. While surveys may also be used initially for other user groups, they may be followed by more in-depth workshops or interviews with individuals in those groups. Once the different types of users have been identified, an open and honest dialogue must be held with them so that their requirements for meteorological and hydrological products and services, the capability of NMHSs to provide them, the means of delivery, the way in which the services will be used, the costs (if applicable) and so forth are clearly understood. For each level of the SDPM, the Implementation Plan for the Strategy will clearly define the service to be provided, how it will be provided and how it should be monitored. For well-defined and well-structured user groups, drafting an MOU,^{17,18} CSA^{17,18} or SLA^{17,18} is a key activity. Regular meetings with the users are essential to ensure that issues are resolved and changing requirements and capabilities are understood. When the services clearly take the form of a public good, undertaking such formal agreements with individuals is not possible. However, in some countries, the requirements of the public may be represented through an organization or representative body. Where this is not the case, different channels such as regular surveys, web feedback and social media should be used for gathering information on the public's requirements, their level of satisfaction with the services, and areas where action is needed to improve service delivery.

¹⁷ See glossary for definition (Appendix 3)

¹⁸ See toolkit of documents and templates (Appendix 4)

Strategy element 2 – Link service development and delivery to user needs

Users should be able to see that a service has been developed and delivered with their particular needs in mind, rather than being provided with a generic product or one created for another purpose. It is important that the user/customer is fully aware of the capabilities of the NMHSs so as to avoid any unrealistic expectations over what products and services can be provided. A number of documents can be used to assist with the implementation of this element. For example, a product catalogue¹⁸ will define the range of data, products and services delivered by NMHSs and a process description document^{17,18} can be used to ensure that an individual service fits into the process of NMHSs for supporting service delivery. A work instruction document^{17,18} will ensure that all those involved in producing the product or service are aware of precisely what is required to ensure a consistent and branded output. In addition, a risk assessment should be carried out to ensure that the risks to developing and delivering high-quality and reliable services can be identified and properly managed.

Strategy element 3 – Evaluate and monitor service performance and outcomes

NMHSs are required to monitor a number of metrics related to the services they provide. These include: accuracy, timeliness, responses to issues raised by the user and user/customer satisfaction. However, it is important that the metrics are agreed upon by the user and customer and that regular reports are provided on the end-to-end performance of the services. These metrics play an important role in identifying areas where the product or service can be improved. A number of forms and documents will be required to effectively implement this strategy element, such as a feedback log¹⁹ to track feedback from users, an action tracker document¹⁹ to ensure that agreed actions are implemented and other documents used to define and report on verification statistics. Descriptions of these documents, as well as templates to be used by staff as a reference, are provided in Appendix 4.

Strategy element 4 – Sustain improved service delivery

User needs evolve and capabilities of NMHSs will change as scientific developments are implemented and technology advances. The constant dialogue with the user required in strategy element 1 will ensure that these changes are identified and that the benefits of the improvements are delivered to the user. The MOU, CSA or SLA are not static documents but should be reviewed and updated as the user's needs evolve, with approval from the user/customer. By sustaining improved service delivery, NMHSs will also bolster their standing and reputation, which helps support their role as the authoritative body for the provision of meteorological and hydrological services with particular emphasis on public good services. The process description template can be used to show how strategy element 4 fits into the overall process for service delivery of NMHSs.

¹⁹ See toolkit of documents and templates (Appendix 4)

Strategy element 5 – Develop skills needed to sustain service delivery

New or improved skills to effectively communicate and interact with users and customers may be required to implement the Strategy. While technical knowledge and capabilities are necessary to develop products and services, other skills such as communication, presentation, consultation with user/customers and analysis of their needs will also be required, which may not be the traditional areas of expertise for staff of NMHSs. These new skills should be clearly defined as required competencies in the job description documents¹⁹ of staff working in service delivery. The WMO Public Weather Services Programme has developed competency requirements for staff of NMHSs working in product and service development and delivery.²⁰ A gap analysis of existing competencies should be used to identify areas requiring training, which should lead to the development of standard training modules to ensure that all staff members have the opportunity to learn and develop these skills.

Strategy element 6 – Share best practices and knowledge

WMO has done some excellent work in the past to ensure that best practices and knowledge are shared among NMHSs and it is essential that this continues. Twinning arrangements and mentoring between developed and less-developed NMHSs are highly encouraged as a way to promote the exchange of experiences, technical know-how, best practice models and guidance, resulting in improved service delivery. Such arrangements can be facilitated by the Secretariat.

²⁰ Fifteenth session of the WMO Commission for Basic Systems, 2012 (CBS-15/Doc 4.5.1(1)). (<https://docs.google.com/viewer?a=v&pid=sites&srcid=d21vLmludHxjYnMtMTV8Z3g6MTIiOTRiYzM2YzAwMmM0Nw>)

APPENDIX 3: GLOSSARY

Some of the definitions below are based on the Information Technology Infrastructure Library (ITIL) standards for IT Service Management, and others have been added that are not based on the standards. Further information on these standards can be found at: <http://www.itil-officialsite.com>.

Accuracy	The degree to which a forecast parameter matches the observed value (for example, on 9 days out of 10, the forecast maximum temperature issued at midday on the previous day fell within the agreed target range compared to the maximum temperature on the day observed. This gives an accuracy measure of $9/10 * 100 = 90\%$).
Collaborating organization/partner	An organization or entity (such as a university, a specialized non-governmental centre or a relevant government agency) of a WMO Member that provides complementary/additional weather-, climate-, water- or environment-related information to NMHSs or directly to users, under terms and conditions that have been mutually agreed upon.
Commercial service	A product or service provided to a customer on a fee-paying basis. Normally, the price of the product or service will be determined by the production cost plus an element of profit.
Compliance	Adherence to standards, regulations and other requirements.
Component	A part of a product, for example in the form of a graph, data or text.
Coordinator	An organization or entity that facilitates or coordinates the delivery of products and services. For this Strategy, the WMO Secretariat fulfils this role. Working closely with Members, the Secretariat sets standards for weather-, climate-, water- and environment-related products and supporting services. This includes observations, data quality and telecommunications. The data underpinning meteorological and related products require international coordination and validation to guarantee that they meet the needs of the product-generating centres. The communication systems that move data and products globally are coordinated through the Secretariat. The assessment and objective verification of products that are generated by one country and used by others may also be coordinated by the Secretariat and the results shared in order to improve the quality of products for all.
Customer	The person or organization which pays for products and services and agrees on the specifications for delivery through a CSA or SLA. The customer may or may not also be the user.

Customer-supplier agreement (CSA)	A document defining the services or products to be delivered by one party to another. Roughly analogous to a contract, but customarily used by different parts of government.
Effectiveness	The degree to which the service or product benefits the user. This measure tries to assess the actions taken by users as a result of the service they have received and consequently the tangible benefits of that service or product.
Fit for purpose	The product or service should be suitable for the intended purpose, should result from collaboration and dialogue among users, providers, suppliers and partners and demonstrate that a clear agreement has been reached, either implicitly or explicitly, by all involved. Having a service be clearly fit for purpose takes the following into account: <ul style="list-style-type: none"> • Current and evolving user needs; • Provider capabilities, including strengths and limitations; • What services will be provided and how they will be provided; • How services will be used; • Expectations of acceptable outcomes and provider performance; • Acceptable costs or levels of effort; • Risks inherent in applying information to decision-making.
Memorandum of understanding (MOU)	A document used when a formal contractual agreement cannot be entered into, and which outlines the responsibilities of different parties with respect to a service.
NHS	A National Hydrological Service
NMHSs	National Meteorological Services (NMSs) and National Hydrological Services (NHSs) (always used in the plural).
NMS	A National Meteorological or Hydrometeorological Service
On Time In Full (OTIF) score	A measurement of delivery performance in a supply chain which takes the point of view of the customer. It measures how often the customer gets what they want by the time they wanted it.
Operating-level agreement	An agreement between providers, suppliers and partners detailing how a service or group of services will be delivered.

Process description document	A document which forms part of the quality management system (QMS) documentation process. In the context of the Strategy, it describes the process of service delivery within an NMS.
Product	Basic information such as observations and datasets or information resulting from an analysis or forecast process that the user will base his or her decisions on.
Production unit	The group responsible for creating the products delivered as part of the service.
Providers	Individuals or entities that produce or acquire weather-, climate-, water- or environment-related information or products, which are then delivered according to user needs. Providers may include NMHSs, partners, other relevant agencies or the private sector.
Quality	A measure indicating to what extent a set of intrinsic characteristics of a product or service meets customer requirements.
Service	The delivered product and the activities associated with the people, process and information technology required to deliver it, or an activity carried out (advice, interpretation, etc.) in order to meet the needs of the user or which can be applied by a user.
Service delivery	A continuous process for developing and delivering user-focused services, defined in terms of user engagement, service design and development, evaluation and improvement.
Service delivery champion	An individual at an appropriately senior level who is responsible for improvements in service delivery. This individual will require the support of senior management and will need adequate training and resources in order to deliver and sustain these improvements.
Service-level agreement (SLA)	A non-technical document agreed upon between the provider of a product or service and the customer, which defines exactly what is required from both parties.

Service priority	The level of priority can be defined in a number of ways, but is traditionally separated into high, medium and low. An example of high priority includes products which are used to minimize the risks to life and serious injury.
Technical support group	<p>The technical support group is responsible for ensuring that equipment, such as the information technology and communication networks required to support service delivery, is available in accordance with the SLA.</p> <p>Different levels of support may be involved, including:</p> <p>1st line: initial support and the users' first point of contact.</p> <p>2nd line: more in-depth technical support to assist in resolving issues that cannot be solved by the 1st line.</p> <p>3rd line: expert assistance involving a more in-depth analysis in order to resolve problems that cannot be solved by the 1st or 2nd line support.</p>
Timeliness	A measure of the ability to have the product delivered by the time agreed upon with the customer in the SLA. This should take account of the delivery time from provider to user. It is unreasonable to expect the provider to be accountable for any breakdowns in the infrastructure required to deliver the product that is outside the responsibility of NMHSs.
User	The individual, organization or intermediary who receives the product and service and bases his or her decisions on it. For the delivery of public weather services, members of the public will ideally have their needs considered by an organization or representative body, although in reality this is often done in an ad hoc manner based on different information-gathering methods such as surveys or focus groups, involving little direct contact with individual members of the public.
Work instruction template	A document provided to the individual producing the product or service, defining exactly what is required by the user (see template (G) in Appendix 4).

APPENDIX 4: TOOLKIT OF DOCUMENTS AND TEMPLATES

This table provides a list of the documents and templates referred to in the Implementation Plan, with a brief description and an indication of which strategy element they support.

The documents and templates themselves are included in this appendix in the order presented in the table.

	Document/template	Description	Related to strategy element:
(A)	Memorandum of understanding (MOU)	An agreement often used when parties do not want a legal commitment or when they cannot create a legally enforceable agreement.	1
(B)	Customer-supplier agreement (CSA)	A formal document typically used by an NMS and a government customer, usually at departmental level, which defines the relationship between the two. A CSA is similar in structure to a contract or MOU. However, a CSA is more customer-focused and more “contractual” in the language it uses. Note that government bodies cannot normally contract with other government agencies, so neither MOUs nor CSAs are contracts in the legal sense.	1
(C)	Service-level agreement (SLA)	A non-technical document agreed upon by the provider of a product or service and the customer, defining exactly what is required from both parties.	1
(D)	Feedback log	A document used to record feedback from the user or customer on the products and services provided. This document should also be used to help determine any action taken in response to the feedback.	1
(E)	Action tracker template	A document to keep track of the actions taken based on feedback from the user, customer and staff on ways to improve service delivery.	1
(F)	Product catalogue	A document used to log the products (and services) provided to users and which serves as a reference for other related documents, such as a CSA. The product catalogue ensures visibility of the total portfolio of products and services provided.	2

(G)	Work instruction template	A document used to describe in detail how an individual product is produced, the templates for the product and the inputs/information used to generate the product in order to ensure consistency of output. Any targets such as delivery times should also be included.	2
(H)	Data spreadsheet for service report	A document used to ensure consistent collection of data to support the service report.	3
(I)	Service report template	A template for reporting service delivery performance, timeliness, compliance with product description and achievement of accuracy target.	3
(J)	Example of service delivery compliance checklist	An example of a compliance checklist that can be used to assess service delivery performance; it shows how compliance can be checked against a product description.	3
(K)	Service delivery action plan	The document generated after the level of service delivery is assessed using the SDPM. The action plan defines the actions to be taken over the short, medium and long term, determines who will carry out the actions and establishes the milestones with dates.	4
(L)	Process description template	A template used as part of the QMS to describe the processes used to support service delivery.	4
(M)	Job description template	A document used to describe the activities undertaken as part of an individual's or a team's job and the skills, qualifications or experience required to accomplish the job.	5

DOCUMENT/TEMPLATE (A)

MEMORANDUM OF UNDERSTANDING

between

[insert name]

and

[insert name]

THIS MEMORANDUM OF UNDERSTANDING (MOU), dated ____ [20__],

IS BETWEEN

A. THE PARTICIPANTS

(1) [insert name]

(2) [insert name]

B. BACKGROUND

(a) [Name of National Meteorological or Hydrometeorological Service (NMS)] is recognized as the NMS responsible for providing essential weather-, climate-, water- and environment-related information to the community at large in [insert country].

(b) [Name of user participant/user representative] is in need of weather and climate services.

(c) The participants wish to enter into an MOU to document the understandings reached on the provision of weather and climate services.

1. DEFINED TERMS AND INTERPRETATION

The definitions and rules of interpretation in this paragraph apply to this MOU only.

Intellectual property rights	Intellectual property rights (IPRs) of all kinds, regardless of the form or medium on which they are stored, including all patents, rights to inventions, copyright and related rights, moral rights, trademarks and service marks, trade names and domain names, rights in get-up, rights to goodwill or to sue for passing off or unfair competition, rights in designs, rights in computer software, database rights, rights in classified information (including know-how and trade secrets) and any other rights in the nature of IPRs, whether registered or unregistered and including all applications (or rights to apply) for, and renewals or extensions of, such rights and all similar or equivalent rights or forms of protection which subsist or will subsist in any part of the world, together with all rights of action in relation to the infringement of any of the above.
Memorandum	This MOU and any future variations to it which may be agreed upon by the participants.
Services	The services to be delivered by [insert name] to [insert name] and set out in Annex A of this MOU.

2. DURATION

This MOU will come into effect upon signature of both participants and will continue until terminated under the provisions of paragraph 10.

3. PURPOSE AND SCOPE

3.1 The purpose of this MOU is to set out the arrangements agreed upon by the participants in respect of the services.

3.2 The scope of this MOU is limited only to the services and does not extend to other activities carried out by the participants.

4. [PARTICIPANT PROVIDING THE SERVICES] COMMITMENTS

[insert name of participant] will carry out the services described in Annex A.

5. [PARTICIPANT 2] COMMITMENTS

[insert name of participant] will:

- (a) pay the charges for the services set out in paragraph 7;
- (b) respond to any reasonable request made by [insert name of participant providing services] in respect of the delivery of the services.

6. PERFORMANCE OF THE SERVICES

6.1 The participants will form a [insert name of body] comprised of [insert number/ name of representatives].

6.2 [Insert name of body] will be responsible for monitoring the performance of the services.

7. FINANCIAL MATTERS

7.1 The charges for the services are [XX].

7.2 Payment will be made within [XX] days of receipt of a correctly completed invoice. [Enter any other financial arrangements here.]

8. INTELLECTUAL PROPERTY RIGHTS

8.1 This MOU does not affect the ownership and control of a participant's IPR that existed prior to the date of this MOU. No license to use any IPR is granted or implied unless explicitly stated in this MOU.

8.2 Each participant will grant the other participant a license to use its pre-existing IPRs as necessary for the purpose of performing the services.

8.3 [Name of participant providing the services] hereby grants [receiving participant] a non-exclusive, royalty-free license to use [add description] for the purpose of [insert purpose].

[Enter any other provisions relating to IPRs here.]

9. CONFIDENTIALITY

9.1 Each participant will treat as confidential all information considered as such and will not divulge such information to any person (except to the participant's own employees, government (including Parliament), or audit bodies that need this information) without the other participant's prior written consent. This paragraph does not extend to information which was rightfully in the possession of a participant prior to the establishment of this MOU, which was already public

knowledge or will become so at a future date (unless resulting from a breach of this paragraph) or which is trivial or obvious. Each participant will ensure that its employees are aware of and comply with the provisions of this paragraph.

10. TERMINATION

10.1 The participants may terminate this MOU by mutual consent subject to the approval of [insert name of body indicated in paragraph 6].

10.2 [Name of receiving participant] may terminate this MOU by giving 30 days' written notice if [name of participant providing the services] persistently fails to perform the services in accordance with the description set out in Annex A.

11. REVIEW OF THE MOU

11.1 This MOU will be reviewed every [XX] years, starting no later than [XX] from the commencement date, which is the date indicated at the head of this MOU. In addition, a review may take place when any significant changes to policy or legislation are made, or when the Chief Executive or equivalent officer of either of the participants' organizations has changed.

12. DISPUTE RESOLUTION

12.1 The participants will use all reasonable endeavours to resolve any dispute amicably and in good faith in accordance with the procedures laid down in this paragraph.

12.2 Should any dispute or question arise between the participants in relation to this MOU or any matter relating to the affairs of the participants or the rights, duties or liabilities of any participant:

- (a) the [insert agreed governance body] will discuss the dispute as soon as reasonably possible, with a view to finding a solution;
- (b) if the [insert agreed governance body] is unable to resolve the dispute after 28 days or a longer period agreed upon by the participants, the matter will be referred to senior management for resolution.

12.3 In the event that senior management is unable to resolve the matter, it will be referred to a mediating body acceptable to both participants for resolution.

13. VARIATION

No variation to this MOU will be effective unless agreed upon in writing and signed by an authorized representative of each participant.

14. CONTACT INFORMATION

[Name of participant 1]

Technical contact:

Name:
Position:
E-mail address:
Tel.:

Administration:

Name:
Position:
E-mail address:
Tel.:

[Name of participant 2]

Technical contact:

Name:
Position:
E-mail address:
Tel.:

Administration:

Name:
Position:
E-mail address:
Tel.:

15. LEGAL STATUS

This MOU is not intended to be legally binding. However, it will be interpreted in accordance with the laws of [insert] and both participants are expected to meet the commitments made under it.

Signed by:) [signature here]
For and on behalf of:)
)
Job title:)
Date:)

Signed by:) [signature here]
For and on behalf of:)
)
Job title:)
Date:)

Annex A: Service description

[Insert details of the services being provided and service levels.]

DOCUMENT/TEMPLATE (B)

CUSTOMER-SUPPLIER AGREEMENT

Reference: The NMS customer-supplier agreement

Subject: The strategic framework governing the trade relationship between the customer and the NMS.

Date agreement comes into effect:

CUSTOMER-SUPPLIER AGREEMENT

This document sets out the overarching arrangements that will apply to trading between [name of customer] – the customer – and [name of NMS] – the supplier – with effect from [date].

SIGNED IN DUPLICATE

Date:	Date:
-------	-------

Signature on behalf of the customer:

Signature on behalf of the NMS:

Signed:

Signed:

Name:

Name:

Job title:

Job title:

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CUSTOMER-SUPPLIER AGREEMENT

1. INTRODUCTION [THIS WILL NEED TO BE REFINED IN ACCORDANCE WITH THE NATIONAL CIRCUMSTANCES IN EACH SITUATION]

The NMS is a government entity which provides services to the public and the commercial sector. Its main role with regard to the public is to deliver public weather services. The NMS uses weather-related information and its expertise to assist government departments in achieving their high-level objectives.

The customer is a [department, etc.] responsible for [add description of customer remit].

[The CSA might also contain a number of service definition annexes (SDAs) detailing specific services/output/work packages provided by the NMS and other schedules and appendices providing additional information. The CSA and associated schedules and appendices also describe how the NMS and the customer will work together to deliver the services. The schedules give additional or more detailed information to what is provided in the CSA. This information forms part of the agreement and is thus different from the information provided in the appendices, which informs and supports the agreement as a whole, but does not form part of the agreement itself.]

2. CSA

[Below is the minimum information required for a CSA. Other specific requirements and conditions relevant to SDAs can also be included.]

Scope of requirement

Introduction

[Include general information about what is covered by the agreement and how it is structured, for example:]

This agreement and associated SDAs establish the framework for the services supplied by [name of NMS] to [name of customer].

This agreement comprises: the main document, schedules to the agreement which include service definitions, and appendices which include information that supplements the main agreement.

Shared strategic aims and priorities

[Include information about the customer's strategic aims, responsibilities, governance and/or legislative responsibilities.]

Provision of services/scope of the agreement [delete as necessary]

[Include general overview of services as set out in detail in the SDA, for example:]

Each SDA will describe: the requirement, the programme/service and the relevant drivers, objectives, direction, deliverables and supporting output pricing information.

The duration of each service will correspond to the nature of the services supplied, as specified in the appropriate SDA.

Individual SDAs may be amended using the agreed pro forma statement of change included in Appendix [appendix number].

Conditions

Definitions

[Include explanations of words and expressions used in the CSA, for example:]

Data and/or information	Meteorological, environmental, hydrological or oceanographic data (historical or otherwise) and/or software, graphs, graphics, drawings, documents, trademarks, know-how or any other material provided (in any medium) as part of the services or consultancy services.
Intellectual property rights	Any intellectual property rights, including, but not limited to, copyright, moral rights, database rights, patents, trademarks, domain names, trade secrets or design rights (registered and unregistered) or any application for any such rights in any jurisdiction.
SDAs	Service definition annexes giving detailed descriptions of how and when the services are to be provided and the full cost.
Working day	Mondays to Fridays except for bank holidays and public holidays. A working day consists of up to eight working hours, unless otherwise specified.

Duration of agreement

This agreement comes into effect on _____ and will run for an indefinite term, but is subject to a formal annual review where any amendments to the CSA will be agreed upon by both parties.

[The aim is to develop indefinite or long-term agreements, subject to formal annual review. Longer-term agreements result in lower mark-ups due to decreased risks.]

Legislative requirements

Both the supplier and the customer will comply at all times with international, national and local regulations and legal requirements.

Pricing

[Pricing arrangements must be agreed upon by the supplier and customer. The aim of the NMS is to offer incentivized pricing. If this is not agreeable to the customer, a fixed price must be agreed. Some possible wording may include:]

Specific projects or services provided by the NMS will be the subject of individual agreement with clear outputs and an agreed price.

The basis upon which services are priced will be established for each project individually, based on a fixed price/maximum price/target cost incentive fee.

The reason for having larger-value services is to incentivize NMSs to deliver increasing value to customers via these kinds of arrangements.

The NMS will provide a full breakdown of prices, as appropriate, and allow the customer, or representatives of the customer, to review such information as the customer may reasonably require.

The above arrangements do not preclude the NMS from pricing on a different basis when tendering in open competition.

Termination

[Termination arrangements must be agreed upon with the customer, but may include:]

This agreement may be terminated after a period of notice which must be mutually agreed upon in writing. If a period cannot be agreed upon, the date will be [XX] years from the date of notice or the fulfilment of the last project, whichever comes last.

This agreement may be terminated by either party if the status of the NMS or the customer changes.

If the agreement is terminated by the customer, the customer will indemnify the NMS for any loss or damage that the NMS has reasonably assessed as a result of the termination.

Invoicing and payment

[Include information on how frequently payments will be made (monthly, quarterly, etc.), how invoices will be submitted and to whom, where payments will be made and within what time period (usually within 30 days of receipt of invoice). Note that all invoices will be subject to VAT. Possible wording for inclusion may be:]

Invoices will be submitted monthly by the NMS to the customer for payment authorization, unless otherwise stipulated in the SDAs.

Payment will be made by the customer within 30 days of receipt of a properly completed and authorized invoice. Payment may be withheld pending the resolution of a dispute, but only when the payment is for the services or supplies under dispute.

Reporting

The NMS will decide with the customer on appropriate performance indicators for service delivery and on the frequency, format and content of the reports describing the progress made with the services and products. The SDAs will provide details on the agreed level of performance and reporting structure.

Amendments to the agreement

[Amendments must be agreed upon with the customer, but may include:]

Proposed amendments to the CSA will be discussed and agreed upon at the annual review, with changes made via an amendment letter written by the customer.

Individual SDAs must be amended using the pro forma statement of change included in Appendix [appendix number].

Intellectual property rights

[A decision will need to be made on whom controls/manages the intellectual property right and the rules of usage.]

Points of contact

Appendix [appendix number] provides details on the points of contact for the CSA. Individual SDAs will each indicate their own relevant points of contact.

[Delete if not needed and insert generic points of contact for all parties.]

Dispute resolution

The customer and the NMS will use all reasonable endeavours to resolve any dispute under the agreement through consultation and negotiation. In the event of failure to resolve the dispute, the matter should be referred to [insert customer representative] acting as the overarching customer and the Chief Executive of the NMS for joint resolution.

Warranties

[Warranties need to be agreed upon with the customer, but are usually:]

The NMS excludes all warranties, conditions, terms, undertakings and obligations, whether express, implied, statutory or otherwise permitted by law.

The NMS warrants that the data provided under this CSA are either owned by the NMS or that it has the necessary authority to sub-license the data to the customer.

Limitation of liability

[This is to be negotiated between the NMS and the customer. The NMS liability does not usually exceed 200% of the amount paid or covers the part of the services from which the claim for loss arises.]

Notices

[This is to be decided with the customer, but should specify how any notice in connection with the agreement will or may be made (in writing, by post, etc.):]

Any notice given under the agreement will be made in writing, in English, and may be sent by hand, post, recorded delivery service or transmitted by facsimile service to the address shown in the agreement or to another address subsequently provided by the customer, and will be deemed duly given on the day when, in the ordinary course of transmission, it would have first been received by the addressee in normal business hours.

3. SCHEDULES

Schedule A: Summary of services and prices

[This is only necessary if there are multiple services (and therefore SDAs) covered by the agreement. An example of a possible layout is provided below.]

Summary of services and prices

Schedule ref	SDA	Duration of agreement	Services	Price Yr1	Price Yr2	Price Yr3	Price Yr4
			Total				

4. CSA APPENDICES

These are likely to include at least the following:

- Appendix 1: Points of contact/responsible officers**
- Appendix 2: Pro forma statement of change**
- Appendix 3: Standing agenda for annual CSA review meeting**
- Appendix 4: The NMS and the customer's shared vision of the trade relationship**

CUSTOMER-SUPPLIER AGREEMENT

Points of contact/responsible officers

The NMS:

Contractual contact:

Technical contact:

Customer details:

Note: The name, e-mail address, telephone number and job title of the points of contact/responsible officers may change from time to time. When such a change occurs, the other party will be notified and the appendix can be automatically amended without having to resort to the process defined in the CSA for amending the agreement.

CUSTOMER-SUPPLIER AGREEMENT

Pro forma statement of change

This pro forma statement of change is to be used by the NMS and the customer to record changes to the SDAs when agreed by all relevant parties. The form must be signed by an authorized representative from each relevant party. Changes agreed via the pro forma statement will automatically be included in the appropriate SDA, unless otherwise specified.

Change no. (000/FY):	Contract no: SDA reference:
Details of change:	
Signature:	Signature:
For NMS: Job title: Date:	For the customer: Job title: Date:

Distribution: [Add all people that need to be aware of change.]

CUSTOMER-SUPPLIER AGREEMENT

Standing agenda for annual CSA review meeting

Suggested starting point for agreeing on the agenda:

- Review of the procedures and processes established in the CSA;
- Proposals from the customer on amendments to the CSA and issues to be addressed in the coming year;
- Proposals from the supplier on amendments to the CSA and issues to be addressed in the coming year;
- Agreement on actions to be taken.

CUSTOMER-SUPPLIER AGREEMENT

The NMS and the customer's shared vision of the trade relationship

[This section should give details on how the two parties will work together to achieve their present and future aims and objectives, both individual and shared.]

DOCUMENT/TEMPLATE (C)

SERVICE-LEVEL AGREEMENT TEMPLATE

ARTICLE I. PARTIES

Describe the parties involved in the SLA.

ARTICLE II. SCOPE

Section 2.01 Scope

Describe the purpose and extent of the SLA.

Section 2.02 Assumptions

Define any assumptions underlying the defined scope.

Section 2.03 Goals and objectives

Describe what the parties are expecting to accomplish with the SLA.

ARTICLE III. ROLES AND RESPONSIBILITIES

Describe the role of each party involved in the SLA and the responsibilities they must assume to comply with the SLA and deliver the products and services defined therein.

ARTICLE IV. EFFECTIVE DATE AND TERM

Indicate the date the agreement becomes effective and its duration.

ARTICLE V. DELIVERY AND PERFORMANCE

Describe in detail what each party is responsible for delivering and the key performance indicators to ensure compliance.

ARTICLE VI. REPORTING, REVIEWING AND AUDITING

Describe oversight and reporting on the agreement, when the agreement should be reviewed, and the points of contact for reporting.

ARTICLE VII. COST/FUNDING AND PAYMENT

Document the costs associated with the SLA, who is responsible for paying or funding and when payment should be made. The cost may be broken down by specific line items, such as labour, supplies, equipment, travel, training, etc.

ARTICLE VIII. CHANGES AND MODIFICATIONS

Describe the process by which changes or modifications can be made to the SLA and who is responsible for making such changes.

ARTICLE IX. TERMINATION

Describe the terms for termination and the procedure to follow.

DOCUMENT/TEMPLATE (D)

FEEDBACK LOG

Introduction

This diagram is intended to illustrate the flow of feedback from users.

This diagram is intended to illustrate the flow of feedback from users.			
User ==>	Feedback	Questions raised ==> Answers provided by nominated person	
		+	
		Issues raised ==> Change proposed	
Record of changes			
Version	Author	Date	Comments

FEEDBACK LOG EXAMPLE

USER COMMENTS, ISSUES AND QUESTIONS RAISED						
Feedback reference	Source of feedback	Category	Type of feedback	Comment	Specific product reference (if appropriate)	Applicable action reference
Unique reference for each piece of feedback	Direct user feedback/survey/phone/e-mail/face-to-face/etc.	Stakeholder/customer/user/staff	Question/complaint/compliment/feedback	Record the feedback as it was received.	P0001_TAF P0002_PLRF	Taken from action tracker document, an action can be used for more than one feedback.
FBL0001	E-mail	Stakeholder/Minister	Feedback	It would be useful to have the issue time and creation time on each forecast produced.		ACT001
						Example

DOCUMENT/TEMPLATE (E)

ACTION TRACKER

Introduction

Actions are recorded based on information from user feedback, service reports or staff feedback, with the objective of improving service delivery.			
The purpose of this spreadsheet is to keep track of the analysis related to user feedback.			
Record of changes			
Version	Author	Date	Comments

ACTION TRACKER EXAMPLE

ACTIONS RESULTING FROM USER FEEDBACK					
Action reference	Indicate all sources that have prompted this action. (This may be from the feedback log or service report.) FBL = Feedback log SR = Service report	Date raised	Action to be taken	Action owner	Progress/status Indicate date for each comment so that progress can be tracked. Final status is CLOSED
ACT_001	FBL001	17/05/2012	Update template to include creation time and issue time.	Service delivery manager	17/5/12 IN PROGRESS Task raised with operations to update template. Example

DOCUMENT/TEMPLATE (F)

PRODUCT CATALOGUE

Product reference	Name of product	Link to work instruction document	Link to service-level agreement	Production unit	Actions in feedback log
P0001_SIGMET	SIGMET	Provide link	Provide link	Aviation Bench	ACT_001
P0002_PRF	PWS Regional Forecast	Provide link	Provide link	PWS Bench	ACT_001

DOCUMENT/TEMPLATE (G)

WORK INSTRUCTION TEMPLATE

WORK INSTRUCTION

PRODUCT NAME

SLA reference:	
-----------------------	--

Service delivery manager:	
Times/days of issue:	
Transmission details:	
Back-up details:	
Template name(s):	
Service start date:	
Service end date:	
Service priority:	
Production time:	

Summary of changes made to document			
Version	Date	Author/Reviewer	Notes on instructions for change
1.0		A	
		R	

Service description

Location/forecast area:
Local production detail:
Site:
Position:
Template name:
Purpose of service:

Which service element is to be provided:

1. Service element 'a'
2. Service element 'b'
3. Service element 'c'
4. Service element 'd'

Production methodology:

1. Service element 'a'

Service name:

Template name:

Deadlines:

Amendment criteria:

Delivery method:

Back-up details:

2. Service element 'b'

Service name:

Template name:

Deadlines:

Amendment criteria:

Delivery method:

Back-up details:

3. Service element 'c'

Service name:

Template name:

Deadlines:

Amendment criteria:

Delivery method:

Back-up details:

4. Service element 'd'

Service name:

Template name:

Deadlines:

Amendment criteria:

Delivery method:

Back-up details:

DOCUMENT/TEMPLATE (H)

DATA SPREADSHEET FOR SERVICE REPORT

Product delivery

Product	Timeliness	Compliance			
Product 1	97	95	Timeliness and compliance are based on the specifications set out in the work instruction documents for each product. This should include a time/day by which the product is to be delivered (based on customer requirements) and the content of the product.		
Product 2	91	87			
Product 3	89	93			
Reported figures this month					
Timeliness	92				
Compliance	92				
OTIF	85				
Record of previous months	Month - 2	Month - 1	This month		
Timeliness	86	90	92		
Compliance	92	93	92		
OTIF	79	84	85		
Rolling average	79	82	83		

DATA SPREADSHEET FOR SERVICE REPORT

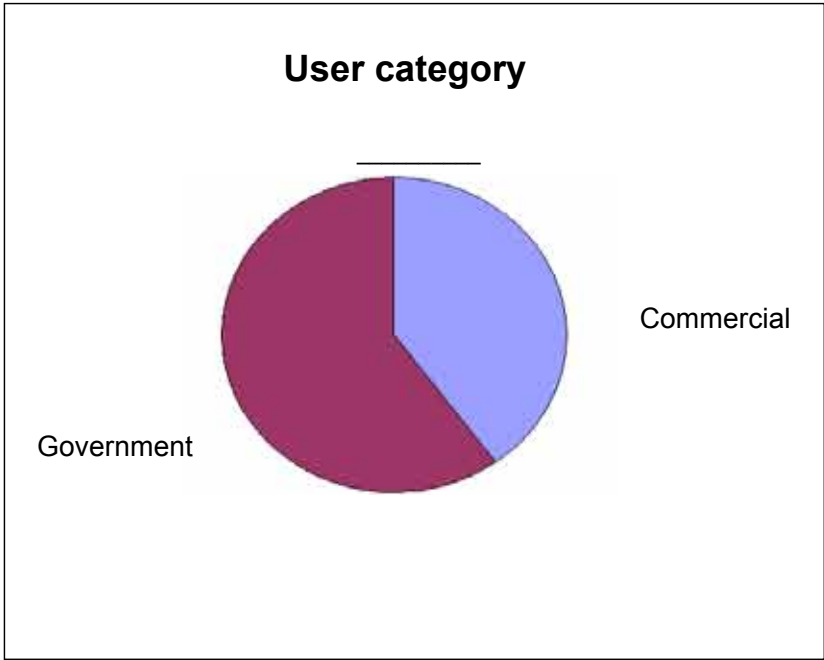
Product accuracy

	Description	Achieved accuracy	Target accuracy	Target met	
Product 1	Percentage of forecasts where temperature forecast was within 2 degrees of observed on day 2	72	70	Yes	If the achieved accuracy is greater than the target accuracy, then target is met.
Product 2	Percentage of forecasts where wind speed forecast was within 5 knots of observed on day 2	68	70	No	
Product 3	Percentage of warnings issued that were correct (Hits/false alarms + misses)	52	50	Yes	
Reported figure this month					
	Percentage of products meeting accuracy target	67			
Record of previous months					
		Month - 2	Month - 1	This month	
	Percentage of products meeting accuracy target	57	62	67	

DATA SPREADSHEET FOR SERVICE REPORT

User type

Commercial	36
Government	64
This information should be based on the categorization of the customers being supplied.	



DOCUMENT/TEMPLATE (I)

SERVICE REPORT TEMPLATE

1. SERVICE REPORT

Reporting period: from _____ [DD/MM/YY] to _____ [DD/MM/YY].

All targets should be based on customer requirements. If the customer does not require the measure to reach 100 per cent, then this should not be the target. It is likely that a period of reporting without targets will be necessary before appropriate targets can be set. Targets should always be challenging, but not impossible.

You may find that including graphs provides a useful visual presentation of the results.

1.1. Product delivery

Data gathered using the data spreadsheet for the service report.

Reference	Measure	Month - 2 [Month before last]	Month - 1 [Last month]	This Month [Indicate month]
M1	Percentage of products on time	86	90	92
M2	Percentage of products meeting specification	92	93	92
M3 (M1xM2)	OTIF score	79	84	85

1.2. Rolling Average of OTIF

Over the first 12 months, report the average of the scores recorded each month so far. Once the first 12 months have been recorded, calculate the average of the last 12 months, dropping off the oldest month and adding in the score of the new month.

This will show trends and smooth out any peaks and troughs.

Month	M -2	M -1	M										Target
OTIF score	79	84	85										
Rolling average	79	81	83										80

1.3. Summary of product delivery performance

Provide a summary of the reasons if compliance with specification or timeliness was not reported as 100 per cent upon delivery.

1.4. Product accuracy performance

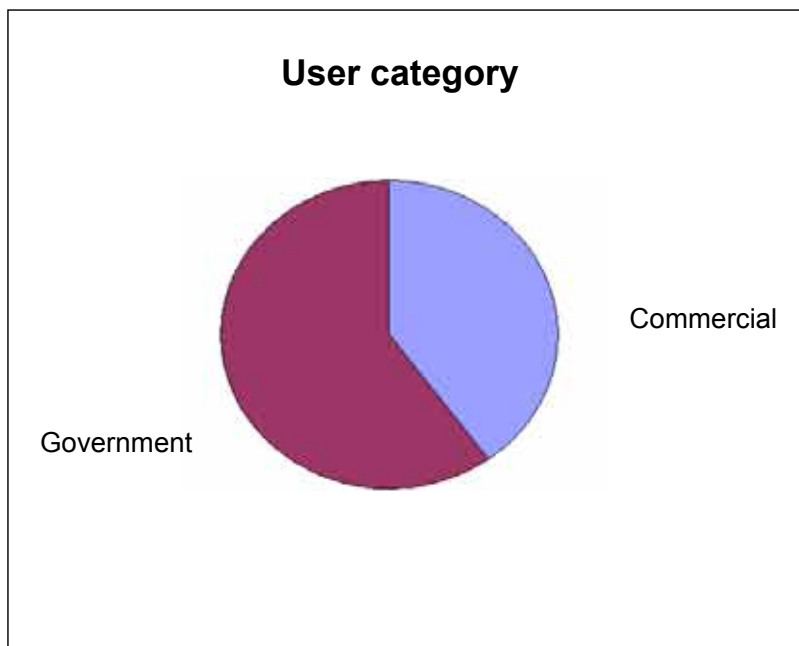
This table can be used once targets for accuracy have been set for the products. If no targets exist, report the actual accuracy for each product until enough information has been gathered to set a target.

Reference	Measure	Month - 2 [Month before last]	Month - 1 [Last month]	This Month [Indicate month]	Target
M1	Percentage of products meeting accuracy target	57	62	67	80

1.5. Summary of product accuracy performance

Provide a summary of the reasons why target was not met or accuracy was lower than normal.

1.6. Summary of customer type



1.7. Summary of user feedback

A summary of the user feedback received and the actions being taken.

List of versions

Version	Date	Author	Comment
V0.1	DD/MM/YY	A. Author	First draft
V1.0	DD/MM/YY	A. Author	Comments on draft included. First issue.

DOCUMENT/TEMPLATE (J)

EXAMPLE OF A SERVICE DELIVERY COMPLIANCE CHECKLIST

A checklist should be produced based on the work instruction document for each specific product. The aim of the checklist is to enable an examination of any product in order to determine whether the contents match the customer's specifications.

When tables, graphs and text are used together, they should be consistent within the product. Compliance is thus measured in two parts: content (confirming that the requested components have been included) and consistency (confirming that the different parts of the product are telling the same story).

The suggested sample rate for products is 1 in 12, but this will depend on the number of products being produced. When the same product is produced in low quantities, the sample size can change.

A strict pass or fail should be employed: the omission of any element and a lack of consistency within the product will result in a failure for the entire sample period.

For example, if the product is produced hourly throughout a 24-hour period, two of the products should be selected at random to be checked. If one meets the specification and one fails, there is a 50 per cent pass rate for the day. Over a period of 30 days, the sample would grow to 60 out of 720, which could be considered a more statistically valid sample size.

For each day, the number of passes should be recorded and compared with the number of products produced. At the end of the reporting period, the percentage of passes compared to the number of products produced is used to generate a single OTIF score.

An example of a checklist is provided in Annex A.

24-hour standard text	[Date]				
CONTENT					
Colour: present or missing?					
Ice: Y or N? confidence: H or L?					
Hoar frost: Y or N? confidence: H or L?					
Snow: Y or N? confidence: H or L?					
Fog: Y or N? confidence: H or L?					
Strong wind: Y or N? confidence: H or L?					
Rain: Y or N? confidence: H or L?					
Min air temp: present or missing?					
Min road surface temp: present or missing?					
Wind: present or missing?					
Weather summary: present or missing?					
CONSISTENCY					
Colour: does it tie in with minimum road surface temperature and likelihood of frost/ice/snow?					
Extent and timing of ice/frost: does this tie in with the forecast of frost/ice and forecast time of roads below freezing?					
Timing, height and accumulation of snow: does this tie in with the forecast of snow and forecast time of roads below freezing?					
Weather summary: does it tie in with the colour code and forecast of frost/snow/ice?					

SAMPLE OF PRODUCT RELATED TO CHECKLIST

24-HOUR FORECAST FOR COMPANY X

Valid from noon on Sunday, 6 April 20XX to noon on Monday, 7 April 20XX

Readiness colour	RED
-------------------------	------------

Weather summary		
Element(s)	Y/N	Conf.
Ice	Y	L
Hoar frost	N	L
Snow	Y	H
Fog	N	H
Strong wind	Y	H
Rain	Y	L

Minimum temperatures summary		
	Temp (°C)	Period sub-zero
Air	ZERO	N/A
All roads	PS01	N/A

Rain	>=2 mm/hr for any hour during the 24-hour period
Strong wind	>=25 mph gusts
Fog	Visibility less than 200 metres

Wind	North-westerly around 10 mph, becoming northerly and increasing to around 15 mph by midnight. Easing off again into tomorrow morning. Gusts of up to around 30 mph between midnight and 0800 hours, otherwise not expected to exceed 25 mph.
-------------	--

Ice/hoar frost – extent and timing
Ice: Icy patches possible where damp roads have frozen. Frost: N/A

Snow – timing, height and accumulation
Snow showers likely at times this afternoon, however no significant accumulations expected. A more persistent band of rain and snow expected overnight around 2100 to 0500, although only expected to leave temporary accumulations of 1 or 2 cm.

**24-hour weather
summary**

Isolated snow showers expected at times this afternoon, with some possible brighter spells. Further wintry precipitation will push down from the north this evening, dying out as it slowly moves south into the early hours of tomorrow morning. A brighter start to the day tomorrow, staying dry through the morning.

Comments

Nil

Readiness colour coding

GREEN	Road surface temperatures are expected to remain above freezing with no ice/hoar frost/snow accumulations. Confidence HIGH.
AMBER	Road surface temperatures are expected to fall close to or below freezing. Confidence is LOW regarding ice, hoar frost and/or snow accumulations.
RED	Road surface temperatures are expected to fall to or below freezing with ice, hoar frost and/or snow accumulations likely. Confidence HIGH.

Note: This example is from the UK Met Office.
Forecaster:
Transmitted by the Met Office on 6 April 20XX at 07:58 UTC.

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DOCUMENT/TEMPLATE (K)

SERVICE DELIVERY ACTION PLAN

Action identification number	Action(s)	Who is responsible for the implementation?	When should the action be completed?

DOCUMENT/TEMPLATE (L)

PROCESS DESCRIPTION TEMPLATE

SERVICE DELIVERY PROCESS DESCRIPTION

[NAME OF ORGANIZATION]

AUTHOR: [NAME OF PERSON WRITING DOCUMENT]

DOCUMENT LOCATION: [WHERE THE DOCUMENT IS FILED]

RECORD OF CHANGES

Issue / Rev	Date	Pages	Description of change	Author	Checked by
1	DD/MM/YY	Number of pages changed		Name of person who made the change	Name of person(s) who reviewed the change

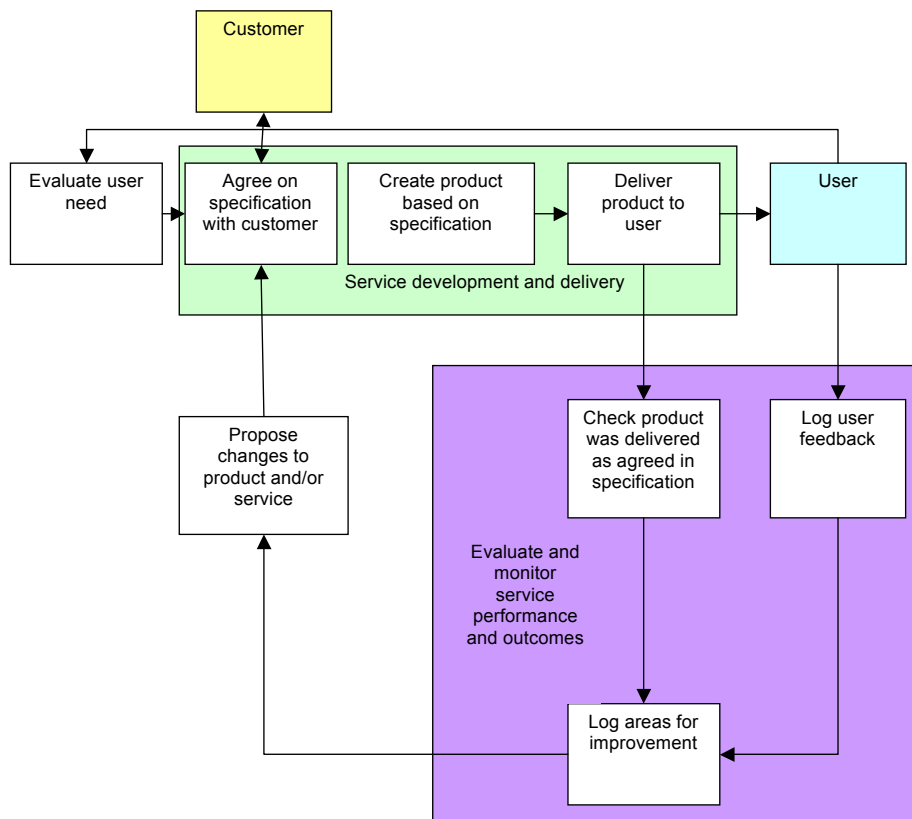
CONTENTS

- 1 PURPOSE OF THE DOCUMENT**
- 2 ORGANIZATION STRUCTURE**
- 3 PRODUCTION ENVIRONMENT**
- 4 PROCESS DESCRIPTIONS**
 - 4.1 Evaluate user needs**
 - 4.2 Service development and delivery**
 - 4.3 Evaluate and monitor service performance and outcomes**
 - 4.4 Sustain improved service delivery**
- 5 PEOPLE AND ROLES**

1. PURPOSE OF THE DOCUMENT

This document forms part of the overarching QMS for service delivery; its purpose is to describe the processes to be used to support service delivery.

A model demonstrating how an organization might try to sustain improvement in service delivery is shown below. Each organization is likely to have their own version based on their own organizational processes.



2. ORGANIZATION STRUCTURE

Provide a diagram of the people within the organization and the reporting structure.

3. PRODUCTION ENVIRONMENT

The service delivery processes are used to describe what happens within the production centre. On a general level, this diagram shows the inputs and outputs of the production centre. There may be a number of processes with inputs and outputs occurring simultaneously within the production centre.

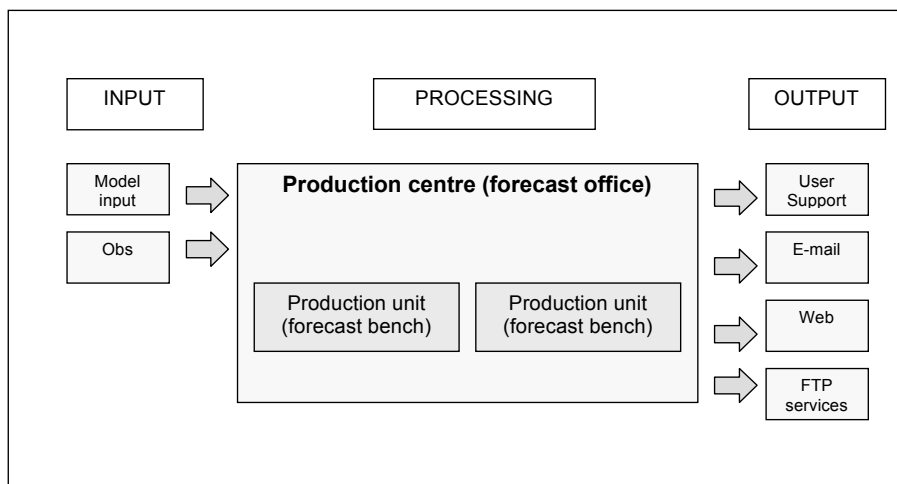


Figure 1. Schematic of the service delivery environment showing inputs and outputs

4. PROCESS DESCRIPTIONS

4.1 EVALUATE USER NEEDS

Describe how you evaluate and manage the user needs related to your service delivery.

How do you determine who your users are and how to get input from them?
What methods do you use to ask for feedback or gain information?
How do you log user input?
Provide information on: <ul style="list-style-type: none">– Who is responsible;– How you log the information;– What categories of users you have (stakeholder/customer/user);– What are your mechanisms for receiving data (survey/phone/e-mail/etc.).
What do you do with the user feedback?
Describe the steps you take to analyse the information and decide which changes to make based on the information.
How do you update users on the actions taken?
Describe how you communicate the actions you are taking based on the user feedback.

4.2 SERVICE DEVELOPMENT AND DELIVERY

Describe how you develop services and products and how you manage their delivery.

How do you decide what a product or service will provide?

Provide information on:

- What can influence the need for a new service or for changing an existing product or service;
- How you describe the service or product to be delivered;
- Who you consult with to create a description of the service or product;
- How you break down the description of the product or service;
- How you communicate new and changed products and services to your users and customers;
- How you decide what level of service is required in terms of accuracy, timeliness, compliance and effectiveness.

How do you describe your products and services?

Describe how you document the products and services you deliver to ensure consistent standard of output.

Provide information on how you describe what standards are expected or what targets you have set for the products and services delivered.

4.3 EVALUATE AND MONITOR SERVICE PERFORMANCE AND OUTCOMES

How do you monitor the delivery of your products and services?

Provide information on:

- What you monitor (time of delivery/accuracy of forecast/quality of content against specification/effectiveness of output in terms of user benefit);
- How you decide what to monitor;
- How you record the results of your monitoring;
- Who does the monitoring;
- When the monitoring is undertaken;
- How you reach an agreement on what to monitor and the targets that may be set.

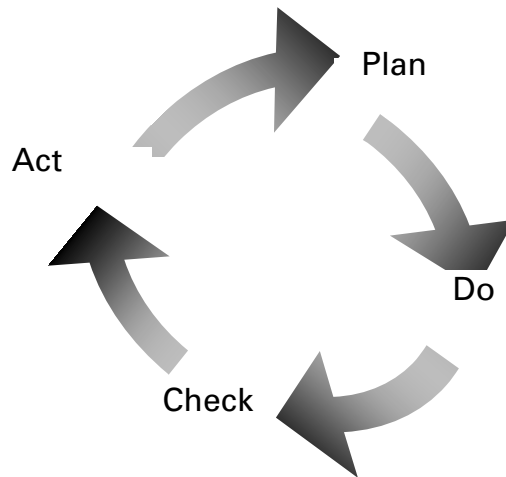
How do you report the performance of the delivery of your products and services?

Explain how you report the performance of the services delivered.

Describe who you submit the report to.

Describe what actions you take based on the report.

4.4 SUSTAIN IMPROVED SERVICE DELIVERY



How do you ensure that you are making improvements in service delivery?

Provide information on:

- How you log problems with your service delivery;
- The process you use for recording improvements to be made;
- What you do with the ideas for improvements.

How do you know if the improvements have worked?

Describe how you find out if the improvements have worked.

Explain how this influences decisions in the future.

How do you share knowledge about improvements?

Provide information on:

- Who you tell about improvements made;
- How you tell people;
- What you tell them and when.

5. PEOPLE AND ROLES

Use this table to state what roles people have within the service delivery organization, what they do and why. A summary of essential skills or experience required to take on the role should also be included.

Roles of people in service delivery

Role name	Role description and purpose	Essential skills and experience
Forecaster	Responsible for taking model output to create the products based on the product specification.	Able to interpret forecast model data. Able to use tools required to produce forecast. Able to speak to customers about products.

DOCUMENT/TEMPLATE (M)

JOB DESCRIPTION

Job title	
-----------	--

Background: (Describe the context, why the job exists, the position of the job in the structure, etc.)

--

Job purpose: (Summarize the overall required output or outcome of the job in a single sentence.)

--

Job responsibilities: (Example provided below; put in order of priority, starting with most important.)

Activities	Object	Result
Prepare, monitor and control . . .	the annual programme budget . . .	to ensure expenditure is in line with the programme plan.

1.	
2.	
3.	
4.	
5.	
6.	

PERSON SPECIFICATION

Qualifications, skills & abilities

Essential criteria: (Describe the skills the candidate must have, in order of importance. Each criterion should describe just one skill that is necessary for effective performance in this particular job.)

1.	
2.	
3.	
4.	
5.	
6.	

Desirable criteria: (Describe the skills the candidate should also ideally have.)

1.	
2.	
3.	
4.	

Additional information: (Include any additional comments, such as development opportunities.)

--

APPENDIX 5: SERVICE DELIVERY EXAMPLES

A number of examples of effective service delivery are included in the Strategy. Some more examples are provided below, as well as some examples of cases in which changes need to be made to improve the levels of service delivery. As the implementation of the Strategy progresses, many more examples of effective practice will become apparent, as will areas where problems have been identified and action plans put in place to improve service delivery. It is anticipated that this information will be conveyed through the reporting process.

Examples of effective service delivery:

1. An NMS identifies the need for and creates the position of specialist adviser, who will work alongside a team accountable for emergency response. The advisor interprets forecasts and warnings for these key users/customers and provides support in both scenario-based training and real incidents. He or she is also able to form a clear understanding of user/customer needs through continuous dialogue, which helps the NMS to assess its performance and plan service improvements;
2. An NMS runs a series of regional workshops on its severe weather warnings for professional users. Based on the feedback gathered, it redesigns its warning service, moving away from set meteorological thresholds towards more relevant and flexible warning criteria based on impacts and thresholds for user/customer actions;
3. An NMS conducts an online user/customer satisfaction survey of its products and services. The results are discussed with a user group selected from key stakeholders. This group is able to recommend changes to products, set targets and influence the strategic plans of the NMS. For example, a customer requirement to see web-based and near real-time evaluations of recent forecasts is quickly acted upon and the necessary changes implemented.

Examples of less effective service delivery:

1. Following a period of severe flooding, a government report highlights a lack of coordination of the overall flood forecasting process. According to their own measures, the NMS and the National Hydrological Service (NHS) responsible for weather warnings and flood warnings are both performing well. Yet lack of ownership and accountability for the performance of the end-to-end process means that flood forecasting is not as effective as it could be, with a potential risk to safety and a large socio-economic cost to the nation;
2. An NMS lacks contact with its end-users. Forecasts and warnings only reach officials in ministries and are not communicated further;
3. The business division within an NMS wishes to exploit a new forecasting technique recently developed by scientists within the service. But the product's capabilities and expected levels of performance remain largely undocumented and its design has not incorporated user needs. It is poorly understood by the business staff, who are unable to explain it and sell it to potential customers;

4. An NMS designs a web-based suite of forecast products for the aviation sector. The system comprises a combination of graphical output from deterministic and probabilistic models alongside charts and text created by forecasters. The data are often not internally consistent and these inconsistencies are unexplained, thus presenting a confusing and ambiguous picture to users;
5. A service provided to a government department is produced by forecasters on a roster such that up to eight different forecasters may produce the forecast. The terminology used in the forecast is inconsistent, making it difficult for the user to understand and use the forecast effectively.

APPENDIX 6: AN EXAMPLE OF SHARING BEST PRACTICES AMONG NMHSS

Case study on the implementation of the WMO Strategy for Service Delivery

The Director of Meteorological Service A (MSA) was asked by the Director of the neighbouring Meteorological Service B (MSB) to share some of his or her expertise and knowledge of service delivery. His or her Service recently demonstrated its value to its government and citizens by implementing the WMO Strategy for Service Delivery and delivering dramatically improved levels of service. This led to a significant boost in its profile and an increased level of funding for the next five years. The Director was very happy to help and selected his or her Head of Forecasting, who is also the service delivery champion, to spend a few days at the head office of the MSB.

The Head of Forecasting began with a general discussion with the Director and used the questions within the SDPM to determine the MSB's current level of service delivery. What follows is a summary of their discussions on two of the strategy elements and an indication of the level at which the MSB was operating for each element.

Element 1: Evaluate user needs and decisions

"The main users of our forecasts are farmers in rural districts of the country. We work with the Ministry of Agriculture to ensure that our forecasts are understood by the agricultural extension workers who meet regularly with the farmers on the ground, and we supply them with training leaflets to help them understand the services we produce. As MSB is part of the Ministry of Transport, we have recently signed an MOU with the Ministry of Agriculture, which has helped us to ensure that we understand the needs of our users in the farming community.

We also provide forecasts to the international airport and the disaster management committee in each district. We often receive telephone calls from the disaster management committee when we forecast heavy rain that may cause flooding and we make sure to record this feedback as soon as it is received. We have not yet formalized our relationship with the international airport as it is also part of the Ministry of Transport, but we intend to do so soon.

Our users can find information about us and our forecasts primarily through our website and we have an e-mail address and telephone number that is regularly monitored."

Element 5: Develop skills needed to sustain service delivery

"New forecasting staff are trained on the job through an informal process to help them understand the importance of excellent service delivery. Our staff say that they find it useful, but that it is difficult to apply in the real world as they have little contact with our users. Our staff is encouraged to share their ideas on how to improve service delivery, but we have received few suggestions.

One idea we are exploring is to identify a senior member of staff – a service delivery champion – who will have the responsibility of improving service delivery and who will be given a budget and some staff members to help. At the moment we are deciding who would be best placed to take on this role."

Comments on element 1:

Most of the users of the services and products can be identified and there are some formal documents describing what is delivered.

A range of contact methods are used and a feedback log is being maintained.

Current level: MSB is currently operating at the Developing level.

Comments on element 5:

It is clear that the Director of MSB understands the importance of effective service delivery and wants to ensure that it is embedded within his or her NMS.

Only a little training is currently being provided and this could be improved, but the intention to identify a service delivery champion should be applauded.

Current level: MSB is currently operating at the Started level.

Action plan:

Once the discussions were concluded, the MSA service delivery champion and the Director of the MSB formulated an action plan that would enable them to improve the MSB's service delivery. The aim was to identify actions that would allow the MSB to demonstrate at least a Developing level of service delivery for all strategy elements. This process could then be repeated after a period of time, with an ongoing action plan enabling steady progress through the different levels of the SDPM.

Action identification number	Action	Who is responsible for implementation?	When should the action be complete?
A1.1	MSB should take steps to formalize relations with all of its users via a CSA or MOU, whichever is most appropriate.	Director of Forecasting	within six months
A1.2	The use of the feedback log should be encouraged for all feedback received and a clear action associated with each piece of feedback.	Director of Forecasting	within three months
A1.3	A variety of additional ways for users to contact the MSB, such as SMS or fax, should be introduced and the new methods widely advertised.	Chief Communications Officer	within three months
A5.1	Regular training workshops on service delivery should be provided for all staff.	Chief of Training	within six months
A5.2	The appointment of a service delivery champion should be concluded as soon as possible, and the individual given the appropriate amount of resources to be able to deliver.	Director of MSB	within three months
A5.3	An improved process for gathering staff suggestions should be developed in consultation with staff, and subsequently implemented.	Director of Human Resources	within six months

APPENDIX 7: ACTION PLAN OUTLINE

This Implementation Plan does not propose a rigid template for a service delivery action plan, as each NMS or service provider will be at a different stage of development and activity. Nevertheless, the following provides some guidance on the aspects to include in such an action plan:

- a. Assess current progress in service delivery;
- b. Identify gaps for each strategy element;
- c. Decide on specific actions to take in order to reduce each gap. For each action, the decision should take into account:
 - The relative priority of that action;
 - The target date for completing the action (with appropriate interim milestones and periods for review);
 - Available evidence demonstrating that the action has been successful;
 - The senior manager responsible for completing the action;
 - The resources allocated for the action;
 - Anticipated future actions to help advance to a higher level of service delivery.

There are a variety of ways that an action plan containing these elements could be structured. Below are two examples.

Example 1

Scope – identify the specific components of the organization involved in the action plan (it may not be the entire organization) and determine the time frame covered by the plan.

Responsibility – identify the service delivery champion.

Assessment of current progress and gap identification – using the organization’s assessment report, state the development level according to the SDPM (i.e., Undeveloped, Development started, Development in progress, Developed or Advanced) for each of the six strategy elements. Identify the target level the organization intends to achieve by the end of the period covered by the action plan and indicate the relative priority of addressing each element.

Strategy element	Current level	Target level	Priority
Evaluating user needs and decisions			
Linking service development and delivery to user needs			
Evaluating and monitoring service performance and outcomes			
Sustaining improved service delivery			
Developing skills needed to sustain service delivery			
Sharing best practices and knowledge			

Actions to be taken – establish a listing of projects or activities to be conducted over the duration of the action plan. Each project or activity should be cross-referenced with the above-mentioned elements and target levels that it will address. The lead manager for the project or activity should also be identified and a listing should be provided in as much detail as possible of the resources allocated for the project or activity.

Project (or activity)	Service element(s) addressed	Lead manager	Supporting resources (people and funding)	Target completion date, including interim milestones
Project 1				
Project 2				
Project 3				

Anticipated next steps – identify future plans to advance the organization to a higher level of service delivery. This could include establishing longer-term projects that will allow the organization to move beyond the target levels established in this action plan.

Example 2

Scope – identify the specific components of the organization involved in the action plan (it may not be the entire organization) and determine the time frame covered by the plan.

Responsibility – identify the service delivery champion.

Assessment of current progress, gap identification and resulting action – using the organization’s assessment report, state the development level according to the SDPM (i.e., Undeveloped, Development started, Development in progress, Developed or Advanced) for each of the six strategy elements, then analyse the gap between the current level and the level the NMS intends to achieve by the end of the period covered by the action plan and establish a project or activity to address the gap. For each project or activity, a lead manager should be identified and a listing should be provided in as much detail as possible of the resources allocated for the project or activity.

Strategy element	Current level	Gap	Actions to be taken to address gap	Lead manager	Resources
Evaluating user needs and decisions					
Linking service development and delivery to user needs					
Evaluating and monitoring service performance and outcomes					
Sustaining improved service delivery					
Developing skills needed to sustain service delivery					
Sharing best practices and knowledge					

APPENDIX 8: BIBLIOGRAPHY AND FURTHER READING

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MOVING TOWARDS A MORE SERVICE-ORIENTED CULTURE



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