Data Broadcasting

June 15, 2000
Matsushita Electric Industrial Co. Ltd
Situation of Digital Broadcasting in Japan
Current Situation in Japan

- CS digital broadcasting service
  - SkyPerfecTV Japan provide digital satellite broadcasting services.

- BS digital broadcasting service and digital terrestrial broadcasting service
  - Japan will start BS digital broadcasting from December, 2000 and digital terrestrial broadcasting not later than 2003.

- Data broadcasting
  - Data broadcasting is expected to differentiate these DTV services from the existing analogue TV services, and therefore stimulate motivations for new business.

- Who will provide data broadcasting in BS digital service?
  - 8 TV broadcasters and 4 Radio broadcasters can provide their data broadcasting services within their allocated bandwidth.
  - They all are very interested in data broadcasting. NHK and other broadcasters are promoting the new services.
  - 8 data broadcasters who provides data services dedicatedly has been authorized.
BML: Broadcast Markup Language
The XML WG of ARIB*) has developed an XML based multimedia content format which can be commonly used for data broadcasting services of satellite and terrestrial broadcasting.

- It ensures high extensibility which is a feature of the XML based coding scheme and international exchangeability.

- It can also be introduced with the minimum influence on receiver costs from the start of BS digital broadcasting in the year 2000.

*) ARIB: Association of Radio Industries and Businesses
### BML: Broadcast Markup Language

- Aimed for data broadcasting services for digital broadcast receiver.

<table>
<thead>
<tr>
<th>Features</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base format</td>
<td>XHTML1.0</td>
</tr>
</tbody>
</table>
| Procedural Description          | ECMAScript  
|                                 | DOM 1.0/2.0(partly)                                 |
| Presentation Control            | CSS1/2                                             |
| Extension for broadcasting use  | - Synchronization with broadcast program          |
|                                 | - Automatic update of presented information        |
|                                 | - Control of video and audio                       |
|                                 | - Remote controller as the main input device        |
|                                 | - Back-channel control                              |
In broadcasting, BML contents are transmitted with DSM-CC carousel.

Telecommunication protocol can be used to send BML contents as well as simple data transmission.
BML: An example

```xml
<?xml version="1.0" encoding="EUC-JP"?>
<?bml bml-version="1.0"?>
<bml>
<head>
<style type="text/css">
    p{
        border-style:solid; border-width:5px;
        border-color:blue; border-color-index:4;
    }
    :focus{
        border-color:red; border-color-index:1;
    }
</style>
<script>
<![CDATA[
    var fpos = "start";
    function focused(pos){
        document.getElementById(pos).firstChild.data = "Came from " + fpos;
        fpos = pos;
    }
    function blured(pos){
        document.getElementById(pos).firstChild.data = "blured";
    }
    function fp0(){focused("p0");}
    function fp1(){focused("p1");}
    function fp2(){focused("p2");}
    function bp0(){blured("p0");}
    function bp1(){blured("p1");}
    function bp2(){blured("p2");}
]]>
</script>
</head>
<body style="background-color:yellow; background-color-index:6; resolution:960x540; clut:sample.clut;">
<p id="p0" onfocus="fp0()" onblur="bp0()"
    style="top:100px; left:100px; width:200px; height 100px; nav-index:0; nav-right:1; nav-down:2">First Paragraph</p>
<p id="p1" onfocus="fp1()" onblur="bp1()"
    style="top:200px; left:100px; width:200px; height 100px; nav-index:1; nav-right:0; nav-down:2">Second Paragraph</p>
<p id="p2" onfocus="fp1()" onblur="bp1()"
    style="top:200px; left:100px; width:200px; height 100px; nav-index:2; nav-right:1; nav-down:3">Last Paragraph</p>
</body>
</bml>
```
End to End Solution for Data Broadcasting
Digital broadcasting system consists of:
- Audio/Video system
- Electric program guide system
- Conditional access system
- Data broadcasting system
Data Broadcasting System Architecture

- **Head-end system**
  - **Content Creation SubSystem:**
    Supports various patterns of content creations/authoring
  - **Carousel Data Transmission SubSystem:**
    Scheduled transmission with automatic rate control

- **DTV software**
  - **BML browser for DTV**
BS Digital Receiver

"d"-key

Cursor key & "OK" key

Cancel key

Color key

Numeric key