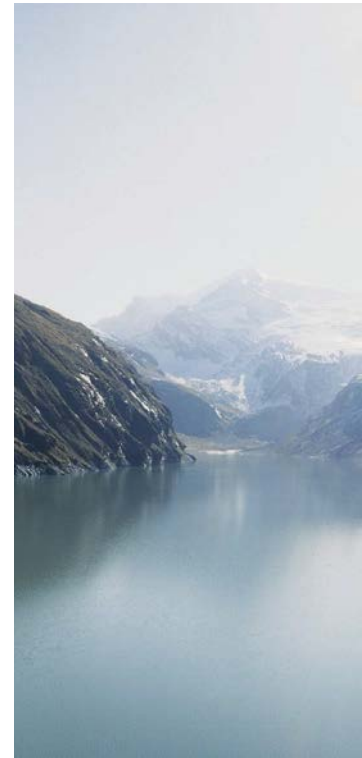


Excel-ähnliche Spreadsheets in Apex Innovation aus einer IT-Abteilung

Weinberger, Wien 14.11.2016

Michael.Weinberger@verbund.com

* APEX 5.x oder APEX 4.x



Das Unternehmen - VERBUND auf einen Blick

95 % der Erzeugung aus Erneuerbaren Energien

Rund 3.000 Mitarbeiterinnen und Mitarbeitern

Über 300.000 Privatkunden.
Nr. 1 bei Industriekunden.

126 Wasserkraftwerke

Nummer 1 beim Klimaschutz
unter europäischen EVUs

Österreichs führendes Stromunternehmen

Strategischer Fokus auf
Österreich und Deutschland

Erste Green-Bond-Unternehmensanleihe
im deutschsprachigen Raum

51% im Besitz der Republik Österreich

Größter Wasserkrafterzeuger Bayerns

**Österreichweite Ladeinfrastruktur
für Elektrofahrzeuge geschaffen**

234 Lehrlinge seit 2009 ausgebildet

Energienahe Produkte & Dienstleistungen

Soziale Verantwortung:
1,3 Mio. € Unterstützung für VERBUND-
Stromhilfefonds der Caritas seit 2009

Starkes Umweltmanagement:
In den Top 10 von weltweit 160 analysierten
Energieunternehmen bei oekom research

Ökologische Maßnahmen:
Bisher 186 Mio. € Investition in Fischwanderhilfen



Auftrag an die IT-Abteilung

Alte
Access Applikation →
ablösen!

Dabei das Spreadsheet
auf der linken Seite
übernehmen

durch:

- zentrale Datenbank
(idealerweise ORACLE)
- schlanker Webclient
(ergo APEX)

The screenshot displays the 'Arbeitsausweis' (Work Certificate) application. The left pane shows a calendar grid for August 2015 with columns for day of the week (WT), day (Tag), start (Von), end (Bis), and various time/percentage categories (NS, Ü50, Ü100, ÜE50, ÜE100, ZA, I, B). The right pane provides a detailed view for Friday, August 14, 2015, including a summary of working hours (von 07:00, bis 14:00, NS 6,00, Ü50% 0,50), a table for 'Kontierung (ILV)', 'Ort / Tätigkeit', and 'Bezugsarten'. At the bottom, there are summary boxes for 'Summen Monat' (NS 168,50, Ü 50% 0,50, Ü 100%, ÜE 50%, ÜE 100%, auf ZA 0,00), 'Überstunden im Haus' (auf ÜZA 0,00, Auszahlung 0,00), and 'Buchungen' (ILV BA ÜS, Stunden 169,00, Kontierung).

Die Umsetzung:

Erfassung (monatlich)
Auswertung
Erstellte Arbeitsausweise
Handy-ILV
Arbeitsausweise genehmigen

2016
Juni
Weinberger Michael
Speichern / neu laden
Hilfe

| WT | Tag | Abw. | Von | Bis | Soll | Ist | Ü50 | Ü100 | ÜE50 | ÜE100 | ZA | ILV | BA | |
|----|-----|------|-------|-------|---------------|-----|-----|------|------|-------|--------------------------|--------------------------|----|---|
| Mi | 1 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Do | 2 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Fr | 3 | ▼ | 09:00 | 14:00 | 8.5 | 4.5 | | | | | <input type="checkbox"/> | | | |
| Sa | 4 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| So | 5 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| Mo | 6 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Di | 7 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Mi | 8 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Do | 9 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Fr | 10 | ▼ | 09:00 | 14:00 | 8.5 | 4.5 | | | | | <input type="checkbox"/> | | | |
| Sa | 11 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| So | 12 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| Mo | 13 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Di | 14 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Mi | 15 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Do | 16 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Fr | 17 | ▼ | 09:00 | 14:00 | 8.5 | 4.5 | | | | | <input type="checkbox"/> | | | |
| Sa | 18 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| So | 19 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| Mo | 20 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Di | 21 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Mi | 22 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Do | 23 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Fr | 24 | ▼ | 09:00 | 14:00 | 8.5 | 4.5 | | | | | <input type="checkbox"/> | | | |
| Sa | 25 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| So | 26 | ▼ | | | | 0 | | | | | <input type="checkbox"/> | | | |
| Mo | 27 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Di | 28 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Mi | 29 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| Do | 30 | ▼ | 09:00 | 17:30 | 8.5 | 8 | | | | | <input type="checkbox"/> | | | |
| | | ▼ | | | Summe: | 187 | 162 | 0 | 0 | 0 | 0 | <input type="checkbox"/> | 0 | 0 |

Abschließen von ÜST und Zulagen

Hinweis: Immer den Punkt (nicht Beistrich) als Dezimaltrennzeichen verwenden: in der Tabelle, bei der Kontierung und bei d

Kontierung (ILV)

no data found

Bezugsarten (Zulagen)

no data found

Anmerkung

ANMERKUNGEN

-

Überstunden im Haus

no data found

... implementiert in Handsontable

<https://handsontable.com>

Popular basic features

- Headers
- Fixed rows/columns
- Sorting
- Merge Cells
- Row/Column Resize
- Row/Column Move
- Conditional Formatting
- Context Menu

[See all features](#)

Pro features

- Fixed bottom rows
- Basic calculations
- Nested Headers

| | ID | Country | Code | Currency | Level | Units | Date | Change |
|----|----|---|------|--------------------|----------|-----------|------------|--------|
| 1 | 1 |  | EUR | Euro | 0.9033 | EUR / USD | 08/19/2015 | 0.26% |
| 2 | 2 |  | JPY | Japanese Yen | 124.3870 | JPY / USD | 08/19/2015 | 0.01% |
| 3 | 3 |  | GBP | Pound Sterling | 0.6396 | GBP / USD | 08/19/2015 | 0.00% |
| 4 | 4 |  | CHF | Swiss Franc | 0.9775 | CHF / USD | 08/19/2015 | 0.08% |
| 5 | 5 |  | CAD | Canadian Dollar | 1.3097 | CAD / USD | 08/19/2015 | -0.05% |
| 6 | 6 |  | AUD | Australian Dollar | 1.3589 | AUD / USD | 08/19/2015 | 0.20% |
| 7 | 7 |  | NZD | New Zealand Dollar | 1.5218 | NZD / USD | 08/19/2015 | -0.36% |
| 8 | 8 |  | SEK | Swedish Krona | 8.5280 | SEK / USD | 08/19/2015 | 0.16% |
| 9 | 9 |  | NOK | Norwegian Krone | 8.2433 | NOK / USD | 08/19/2015 | 0.08% |
| 10 | 10 |  | BRL | Brazilian Real | 3.4806 | BRL / USD | 08/19/2015 | -0.09% |
| 11 | 11 |  | CNY | Chinese Yuan | 6.3961 | CNY / USD | 08/19/2015 | 0.04% |
| 12 | 12 |  | RUB | Russian Rouble | 65.5980 | RUB / USD | 08/19/2015 | 0.59% |
| 13 | 13 |  | INR | Indian Rupee | 65.3724 | INR / USD | 08/19/2015 | 0.26% |
| 14 | 14 |  | TRY | New Turkish Lira | 2.8689 | TRY / USD | 08/19/2015 | 0.92% |
| 15 | 15 |  | THB | Thai Baht | 35.5029 | THB / USD | 08/19/2015 | 0.44% |
| 16 | 16 |  | IDR | Indonesian Rupiah | 13.8300 | IDR / USD | 08/19/2015 | -0.09% |
| 17 | 17 |  | MYR | Malaysian Ringgit | 4.0949 | MYR / USD | 08/19/2015 | 0.10% |
| 18 | 18 |  | MXN | Mexican New Peso | 16.4309 | MXN / USD | 08/19/2015 | 0.17% |

Eine Handsontable ist aus drei Teilen aufgebaut

1. Notwendige Bibliotheken
2. Daten für das Spreadsheet
3. Eigentlicher Aufruf & Konfiguration

Diese Teile werden in Apex mittels einer PL/SQL Bibliothek dynamisch erzeugt und zur Laufzeit gerendert.

Eine zusätzliche Implementation in Javascript ist nicht notwendig.

Notwendige Bibliotheken

```
▶<table id="apex_layout_49892523283989228" border="0" class="formlayout" summary role="presentation">...</table>
▼<style>
  .currentRow {
    background-color: #81BEF7 !important;
  }
  .currentCol {
    background-color: white !important;
  }
  .handsontable td { height: 15px !important; line-height: 15px !important; }
</style>
<script src="/js/handsontable/handsontable.full.min.js"></script>
<link rel="stylesheet" media="screen" href="/js/handsontable/handsontable.full.css">
<script src="/js/handsontable/lodash.js"></script>
<script src="/js/handsontable/underscore.string.js"></script>
<script src="/js/handsontable/moment.js"></script>
<script src="/js/handsontable/numeral.js"></script>
<script src="/js/handsontable/numeric.js"></script>
<script src="/js/handsontable/md5.js"></script>
<script src="/js/handsontable/jstat.js"></script>
<script src="/js/handsontable/handsontable.formula.js"></script>
<script src="/js/handsontable/parser.js"></script>
<script src="/js/handsontable/handsontable.ruleJS.js"></script>
<script src="/js/handsontable/formula.js"></script>
<link rel="stylesheet" media="screen" href="/js/handsontable/samples.css">
▶<div id="example" class="htCenter htMiddle handsontable htColumnHeaders" style="height: 750px; width: 750px; overflow: hidden;" data-originalstyle="height: 750px; width: 750px; overflow: hidden;">...</div>
```

Daten für das Spreadsheet

```

▼<script>
var Monat = [{"300947","Mi","1","","09:00","17:30","8.5","=max(round((LEFT(F1,2)*60+RIGHT(F1,2) - LEFT(E1,2)*60-RIGHT(E1,2)-30) / 60,2),0)","",false,""},
["300948","Do","2","","09:00","17:30","8.5","=max(round((LEFT(F2,2)*60+RIGHT(F2,2) - LEFT(E2,2)*60-RIGHT(E2,2)-30) / 60,2),0)","",false,""},
["300949","Fr","3","","09:00","14:00","8.5","=max(round((LEFT(F3,2)*60+RIGHT(F3,2) - LEFT(E3,2)*60-RIGHT(E3,2)-30) / 60,2),0)","",false,""},
["300950","Sa","4","","09:00","17:30","8.5","=max(round((LEFT(F4,2)*60+RIGHT(F4,2) - LEFT(E4,2)*60-RIGHT(E4,2)-0) / 60,2),0)","",false,""},
["300951","So","5","","09:00","17:30","8.5","=max(round((LEFT(F5,2)*60+RIGHT(F5,2) - LEFT(E5,2)*60-RIGHT(E5,2)-0) / 60,2),0)","",false,""},
["300952","Mo","6","","09:00","17:30","8.5","=max(round((LEFT(F6,2)*60+RIGHT(F6,2) - LEFT(E6,2)*60-RIGHT(E6,2)-30) / 60,2),0)","",false,""},
["300953","Di","7","","09:00","17:30","8.5","=max(round((LEFT(F7,2)*60+RIGHT(F7,2) - LEFT(E7,2)*60-RIGHT(E7,2)-30) / 60,2),0)","",false,""},
["300954","Mi","8","","09:00","17:30","8.5","=max(round((LEFT(F8,2)*60+RIGHT(F8,2) - LEFT(E8,2)*60-RIGHT(E8,2)-30) / 60,2),0)","",false,""},
["300955","Do","9","","09:00","17:30","8.5","=max(round((LEFT(F9,2)*60+RIGHT(F9,2) - LEFT(E9,2)*60-RIGHT(E9,2)-30) / 60,2),0)","",false,""},
["300956","Fr","10","","09:00","14:00","8.5","=max(round((LEFT(F10,2)*60+RIGHT(F10,2) - LEFT(E10,2)*60-RIGHT(E10,2)-30) / 60,2),0)","",false,""},
["300957","Sa","11","","09:00","17:30","8.5","=max(round((LEFT(F11,2)*60+RIGHT(F11,2) - LEFT(E11,2)*60-RIGHT(E11,2)-0) / 60,2),0)","",false,""},
["300958","So","12","","09:00","17:30","8.5","=max(round((LEFT(F12,2)*60+RIGHT(F12,2) - LEFT(E12,2)*60-RIGHT(E12,2)-0) / 60,2),0)","",false,""},
["300959","Mo","13","","09:00","17:30","8.5","=max(round((LEFT(F13,2)*60+RIGHT(F13,2) - LEFT(E13,2)*60-RIGHT(E13,2)-30) / 60,2),0)","",false,""},
["300960","Di","14","","09:00","17:30","8.5","=max(round((LEFT(F14,2)*60+RIGHT(F14,2) - LEFT(E14,2)*60-RIGHT(E14,2)-30) / 60,2),0)","",false,""},
["300961","Mi","15","","09:00","17:30","8.5","=max(round((LEFT(F15,2)*60+RIGHT(F15,2) - LEFT(E15,2)*60-RIGHT(E15,2)-30) / 60,2),0)","",false,""},
["300962","Do","16","","09:00","17:30","8.5","=max(round((LEFT(F16,2)*60+RIGHT(F16,2) - LEFT(E16,2)*60-RIGHT(E16,2)-30) / 60,2),0)","",false,""},
["300963","Fr","17","","09:00","14:00","8.5","=max(round((LEFT(F17,2)*60+RIGHT(F17,2) - LEFT(E17,2)*60-RIGHT(E17,2)-30) / 60,2),0)","",false,""},
["300964","Sa","18","","09:00","17:30","8.5","=max(round((LEFT(F18,2)*60+RIGHT(F18,2) - LEFT(E18,2)*60-RIGHT(E18,2)-0) / 60,2),0)","",false,""},
["300965","So","19","","09:00","17:30","8.5","=max(round((LEFT(F19,2)*60+RIGHT(F19,2) - LEFT(E19,2)*60-RIGHT(E19,2)-0) / 60,2),0)","",false,""},
["300966","Mo","20","","09:00","17:30","8.5","=max(round((LEFT(F20,2)*60+RIGHT(F20,2) - LEFT(E20,2)*60-RIGHT(E20,2)-30) / 60,2),0)","",false,""},
["300967","Di","21","","09:00","17:30","8.5","=max(round((LEFT(F21,2)*60+RIGHT(F21,2) - LEFT(E21,2)*60-RIGHT(E21,2)-30) / 60,2),0)","",false,""},
["300968","Mi","22","","09:00","17:30","8.5","=max(round((LEFT(F22,2)*60+RIGHT(F22,2) - LEFT(E22,2)*60-RIGHT(E22,2)-30) / 60,2),0)","",false,""},
["300969","Do","23","","09:00","17:30","8.5","=max(round((LEFT(F23,2)*60+RIGHT(F23,2) - LEFT(E23,2)*60-RIGHT(E23,2)-30) / 60,2),0)","",false,""},
["300970","Fr","24","","09:00","14:00","8.5","=max(round((LEFT(F24,2)*60+RIGHT(F24,2) - LEFT(E24,2)*60-RIGHT(E24,2)-30) / 60,2),0)","",false,""},
["300971","Sa","25","","09:00","17:30","8.5","=max(round((LEFT(F25,2)*60+RIGHT(F25,2) - LEFT(E25,2)*60-RIGHT(E25,2)-0) / 60,2),0)","",false,""},
["300972","So","26","","09:00","17:30","8.5","=max(round((LEFT(F26,2)*60+RIGHT(F26,2) - LEFT(E26,2)*60-RIGHT(E26,2)-0) / 60,2),0)","",false,""},
["300973","Mo","27","","09:00","17:30","8.5","=max(round((LEFT(F27,2)*60+RIGHT(F27,2) - LEFT(E27,2)*60-RIGHT(E27,2)-30) / 60,2),0)","",false,""},
["300974","Di","28","","09:00","17:30","8.5","=max(round((LEFT(F28,2)*60+RIGHT(F28,2) - LEFT(E28,2)*60-RIGHT(E28,2)-30) / 60,2),0)","",false,""},
["300975","Mi","29","","09:00","17:30","8.5","=max(round((LEFT(F29,2)*60+RIGHT(F29,2) - LEFT(E29,2)*60-RIGHT(E29,2)-30) / 60,2),0)","",false,""},
["300976","Do","30","","09:00","17:30","8.5","=max(round((LEFT(F30,2)*60+RIGHT(F30,2) - LEFT(E30,2)*60-RIGHT(E30,2)-30) / 60,2),0)","",false,""},
["0","","","Summe:
","=ROUND(SUM(G1:G30),2)","=ROUND(SUM(H1:H30),2)","=ROUND(SUM(I1:I30),2)","=ROUND(SUM(J1:J30),2)","=ROUND(SUM(K1:K30),2)","=ROUND(SUM(L1:L30),2)",false,"=ROUND(SUM(N1:N30),2)","=ROUND(SUM(O1:O30),2)"]
];

```


Aufruf und Konfiguration

```
var container = document.getElementById('example');
var hot = new Handsontable(container, {
  data: Monat,
  height: 750,
  width: 750,
  colHeaders: ['Key', 'WT', 'Tag', 'Abw.', 'Von', 'Bis', 'Soll', 'Ist', 'Ü50', 'Ü100', 'ÜE50', 'ÜE100', 'ZA', 'ILV', 'BA'],
  stretchH: 'none',
  columns: [{data:0, readOnly: true, width:1},
            {data:1, readOnly: true},
            {data:2, readOnly: true},
            {data:3, type:'dropdown', source:['KR', 'UR', 'SA', 'DR', 'AZV', 'FT', 'BS', 'ÜZA', 'GZA', 'KRv', 'URv', 'SAv', 'DRv', 'KRn', 'URn', 'SAn', 'DRn', 'BSv', 'BSn', ''], strict:false},
            {data:4},
            {data:5},
            {data:6},
            {data:7, readOnly: true},
            {data:8},
            {data:9},
            {data:10},
            {data:11},
            {data:12, type:'checkbox'},
            {data:13, readOnly: true},
            {data:14, readOnly: true}],
  rowHeaders: false,
  columnSorting: false,
  contextMenu: [
    'undo',
    'redo'
  ],
  allowInsertColumn: false,
  allowInsertRow: false,
  allowRemoveColumn: false,
  allowRemoveRow: false,
  undo: true,
  readOnly: false,
  formulas: true,
  className: "htCenter htMiddle",
  currentRowClassName: 'currentRow',
  currentColClassName: 'currentCol'
});
hot.addHook('afterSelection', function() {
  apex.item( "P1_HANDSON_ISTSTUNDEN" ).setValue( hot.plugin.matrix.getItem( hot.plugin.utils.translateCellCoords({ row: hot.getSelected()[0] , col:7  })).value);
  apex.item( "P1_PK" ).setValue( hot.getDataAtCell(hot.getSelected()[0],0));
  apex.item( "P1_HANDSON_ZEILE" ).setValue(hot.getSelected()[0]);
  $.event.trigger('HandsonMove');
});
hot.selectCell(0,1);
```

Die PL-SQL Prozeduren

1. `Tabelle_in_Item`:
 - Macht genau das: eine Tabelle Zeile für Zeile auslesen und die Werte in ein js-Array schreiben – so wie es Handsontable braucht.
2. `Ausgabe_in_Apex`
 - Schreibt mit `htp.p` jede Menge Javascriptzeilen. Zuerst die notwendigen Bibliotheken, dann das js-Array aus (1) und zuletzt die Konfiguration des Spreadsheets.

Die ersten beiden werden beim Seitenaufbau in einer APEX-Region vom Typ PL/SQL aufgerufen.

1. Daten aus Item speichern.
 - Da die Daten des Spreadsheets unbehandelt in Form eines js-arrays vorliegen, gibt es eine eigene PL/SQL Prozedur, die diese Daten wieder in die Tabelle schreibt.

Diese Prozedur wird beim submit gestartet

Und die Einbindung in APEX

- Eine PL/SQL Region mit zwei Prozeduren:
 - Tabelle_in_Item
 - Ausgabe_in_Apex
- Drei Items
 - P1_HANDSONDATEN beinhaltet die Daten (Array)
 - P1_HANDSON_ZEILE beinhaltet den PK der Zeile
 - P1_HANDSON_ISTSTUNDEN beinhaltet einen Zeilenwert
- Zwei dynamic actions
 - Daten in item zurückschreiben
 1. before page submit
 2. Set value P1_HANDSONDATEN
 3. Javascript expression: `JSON.stringify(hot.getData());`
- Ein PL/SQL Prozess
 - Item_nach_Tabelle (Daten zurückschreiben)

Die Umsetzung in PL/SQL I

```
PROCEDURE Ausgabe_in_Apex (p_item_value in varchar2, p_ro in char default null) IS
BEGIN
    -- Spalten und Zeilenfarbe der aktuellen Zelle
    htp.p('<style>');
    htp.p('.currentRow {');
    htp.p('background-color: #81BEF7 !important;');
    htp.p('}');
    htp.p('.currentCol {');
    htp.p('background-color: white !important;');
    htp.p('}');
    htp.p('.handsontable td { height: 15px !important; line-height: 15px !important; }');
    htp.p('</style>');
    htp.p('<script src="/js/handsontable/handsontable.full.min.js"></script>');
    htp.p('<link rel="stylesheet" media="screen" href="/js/handsontable/handsontable.full.css">');
-- Formel support
    htp.p('<script src="/js/handsontable/lodash.js"></script>');
    htp.p('<script src="/js/handsontable/underscore.string.js"></script>');
    htp.p('<script src="/js/handsontable/moment.js"></script>');
    htp.p('<script src="/js/handsontable/numeral.js"></script>');
    htp.p('<script src="/js/handsontable/numeric.js"></script>');
    htp.p('<script src="/js/handsontable/md5.js"></script>');
    htp.p('<script src="/js/handsontable/jstat.js"></script>');
    htp.p('<script src="/js/handsontable/handsontable.formula.js"></script> ');
    htp.p('<script src="/js/handsontable/parser.js"></script>');
    htp.p('<script src="/js/handsontable/handsontable.ruleJS.js"></script> ');
    htp.p('<script src="/js/handsontable/formula.js"></script> ');
    htp.p('<link rel="stylesheet" media="screen" href="/js/handsontable/samples.css">');

    htp.p('<div id="example"></div> ');
    htp.p('<script>');
    htp.p(p_item_value);
    htp.p('var container = document.getElementById('example');');
    htp.p('var hot = new Handsontable(container, {');
    htp.p('data: Monat,');
    htp.p('height: 750,');
    htp.p('width: 750,');
--     htp.p('colWidths: 47,');
    htp.p('colHeaders: [ 'Key', 'WT', 'Tag', 'Abw.', 'Von', 'Bis', 'Soll', 'Ist', '50', '100', 'E50',
'E100', 'ZA', 'ILV', 'BA' ],');

```

Die Umsetzung in PL/SQL II

```
htp.p('      stretchH: 'none',');
      htp.p('columns: [{data:0,  readOnly: true, width:1},');
htp.p('      {data:1, readOnly: true},');
htp.p('      {data:2, readOnly: true},');
htp.p('      {data:3,type:''dropdown'',source:['KR'', 'UR'', 'SA'', 'DR'', 'AZV'', 'FT'', 'BS'', 'ZA'', 'GZA'', 'KRv'', 'URv'', 'SAv'', 'DRv'', 'KRn'', 'U
Rn'', 'SAN'', 'DRn'', 'BSv'', 'BSn'', ''],strict:false},');
htp.p('      {data:4},'); --von
htp.p('      {data:5},'); --bis
htp.p('      {data:6},'); --soll
htp.p('      {data:7,  readOnly: true},'); --ist
htp.p('      {data:8},');
htp.p('      {data:9},');
htp.p('      {data:10},');
htp.p('      {data:11},');
htp.p('      {data:12, type:''checkbox'',  });
htp.p('      {data:13, readOnly: true},'); --ilv
htp.p('      {data:14, readOnly: true}],  '); -- zulagen
htp.p('      rowHeaders: false,');
htp.p('      columnSorting: false,');
htp.p('      contextMenu: [');
htp.p('          ''undo'',');
htp.p('          ''redo''');
htp.p('      ],');
htp.p('      allowInsertColumn: false,');
htp.p('      allowInsertRow: false,');
htp.p('      allowRemoveColumn: false,');
htp.p('      allowRemoveRow: false,');
htp.p('      undo: true,');
IF p_ro ='j' THEN htp.p('      readOnly: true,');
ELSE htp.p('      readOnly: false,');
END IF;
htp.p('      formulas: true,');
htp.p('      className: "htCenter htMiddle",');
htp.p('      currentRowClassName: ''currentRow'',');
htp.p('      currentColClassName: ''currentCol''');
```

Die Umsetzung in PL/SQL III

```
htp.p('    });');

htp.p('    hot.addHook('afterSelection', function() {});
htp.p('        apex.item( "P1_HANDSON_ISTSTUNDEN" ).setValue( hot.plugin.matrix.getItem( hot.plugin.utils.translateCellCoords({
row: hot.getSelected()[0] , col:7    })).value);');

htp.p('        apex.item( "P1_PK" ).setValue( hot.getDataAtCell(hot.getSelected()[0],0));');

htp.p('        apex.item( "P1_HANDSON_ZEILE" ).setValue(hot.getSelected()[0]);');
htp.p('        $.event.trigger('HandsonMove');');
htp.p('    });');

-- erste Zeile selektieren und PK auslesen
htp.p('hot.selectCell(0,1);');
-- geht nicht: htp.p('apex.item( "P1_PK" ).setValue( hot.getDataAtCell(hot.getSelected()[0],0));');

--htp.p('');
htp.p('    </script>');
    END ausgabe_in_apex;
```

Weitere Möglichkeiten

- Tabellendaten per Klick in Handson einfügen

- z.B. über Column-Link:

```
javascript:hot_ILV.setDataAtCell([[apex.item(%22P2_ILV_ZEILE%22).getValue(),9,%22#PSP#%22],[apex.item(%22P2_ILV_ZEILE%22).getValue(),10,%22#BEZEICHNUNG#%22],[apex.item(%22P2_ILV_ZEILE%22).getValue(),8,apex.item(%22P2_LSTART_DEV%22).getValue()]]);
```

- SODA: variable Tabellen direkt in Oracle speichern und mit SQL abfragen
- Handson-Region offline nutzen