Visualizing the future –
the future of visualizing

Benefits of visual standards in
business communication

Rolf Hichert
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After studying mechanical engineering in Stuttgart, Rolf Hichert worked for the Fraunhofer Institute for Production Technology and Automation (IPA). He worked as a consultant at McKinsey & Co., Inc. in Düsseldorf, and later as a professor at the University of Applied Sciences in Constance.

His subsequent positions: Founder and director of the Transfer Center Technology and Management of the Steinbeis Foundation in Stuttgart, co-founder and managing director of MIK GmbH in Constance/Germany, Chair for Controlling at the Eberswalde University of Applied Sciences, managing director of MIS Switzerland AG in Zurich. In 2004, he founded HICHERT+PARTNER (now HICHERT+FAISST). More than 5000 people have taken part in his seminars HICHERT®SUCCESS.

In 2013 he transferred major parts of his intellectual property to the newly founded non-profit International Business Communication Standards (IBCS) Association in order to publically discuss, disseminate and further develop his property under a Creative Commons license. Today Rolf serves as president of the IBCS Association.

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Jürgen Faisst has been worked with Rolf Hichert in various constellations for more than 20 years. He began his career at MIK GmbH, a software company co-founded by Rolf. He established a new regional office in Düsseldorf and became a managing partner. In 1998 he joined business intelligence pioneer MIS AG, supported the company’s IPO and became COO and CTO of the board. From 2005 to 2013 Jürgen served as CEO of Thinking Networks AG, a leading supplier of corporate planning systems.

Jürgen’s mission as a managing partner of HICHERT+FAISST is to enable business analysts anywhere in the world to benefit from the International Business Communication Standards (IBCS), a set of rules for the design of business communication originally developed by Rolf Hichert.
Summary

People and organizations in various disciplines benefit from their respective notation standards: Consider musicians, geographers, and engineers, just to name a few. A musician never has to devote time to simply understanding another composer’s musical notation, nor an engineer a colleague’s drawing notation – for them such additional effort is inconceivable.

Only business management, it seems, is afforded the luxury of company specific or nonexistent notation standards. The downside being not only additional effort, but, worse still, bad decisions based on incomplete or misleading information. That’s why we developed the SUCCESS set of rules for better transparency in formal communication written for business, such as management reports and presentations. From this set of rules the IBCS® notation standards evolved, which various large corporations and public authorities such as Swiss Post, SAP, KPMG, and the German Military have already adopted. At the end of 2013 the HICHERT®IBCS notation standards were transferred to the non-profit International Business Communication (IBCS) Association for promulgation, maintenance, and further development.

The practical benefits of notation standards in business communication are obvious: Better, faster, and cheaper results in every stage of the decision-making process: from provision of data and systems, to business analysis and the elaboration of messages, and on to the final decision made by the executive.

Analytical software packages supporting the notation standards are essential for leveraging the benefits of their implementation. To assist the selection of suitable business software, BARC Business Application Research Center has been appointed to evaluate the software and issue certification for those able to create HICHERT®IBCS compliant charts and tables. BARC has already certified software packages, such Longview Arcplan 8.

The adoption of the IBCS® notation standards by software vendors will dramatically increase the speed of its dissemination. Perhaps in years to come, notation standards in business communication will be a matter of course as has been the case in music and cartography for hundreds of years.
1 Introduction

Here we briefly cover the obvious advantages of our visual channel for communication; the past, the presence and the future of visualizing in general; types of business communication as well as notation standards in other disciplines.

1.1 Advantages of our visual channel

There are several advantages of using visuals for communication:

1.1.1 Our long-term memory is made for visuals

Visuals stick to our long-term memory. Both our short-term and long-term memory store information in chunks, but the short-term memory is limited. One of the easiest ways to ensure that we can store information in our long-term memory is to pair ideas, data, and concepts with meaningful images. We can recall information much better when it has been delivered through in visual instead of aural or textual form. Visuals help our addressees make sense out of the content and direct attention, increasing the possibilities that they will remember.

"…unless our words, concepts, ideas are hooked onto an image, they will go in one ear, sail through the brain, and go out the other ear. Words are processed by our short-term memory where we can only retain about seven bits of information. Images, on the other hand, go directly into long-term memory where they are indelibly etched…” (Lynell Burmark).

"People think using pictures. Seeing comes before words. The child looks and recognizes before it can speak.” (John Berger)

"Furthermore, this effect increases over time. One study found that after three days, a user retained only 10-20 percent of written or spoken information but almost 65 percent of visual information. Another study showed that an illustrated text was 9 percent more effective than text alone when testing immediate comprehension and 83 percent more effective when the test was delayed.” (Aura Interactiva)

1.1.2 Visuals Transmit Messages Faster

Some facts related to the speed of visual communication:

"The brain processes visual information 60,000 faster than text.” (3M Corporation, 2001)

“90 percent of information that comes to the brain is visual.” (Hyerle, 2000)

“40 percent of all nerve fibers connected to the brain are linked to the retina.” (Jensen, 1996)

Our can see images that last for just 1/10th of a second.

All this indicates that we can process visual information much more efficiently than text.

1.1.3 Visuals Improve Comprehension

Visuals have been found to improve our understanding by up to four times compared to merely reading.

"When words and visual elements are closely entwined, we create something new and we augment our communal intelligence ... visual language has the potential for increasing ‘human bandwidth’ – the capacity to take in, comprehend, and more efficiently synthesize large amounts of new information.” (Robert E. Horn, Stanford University)

Good infographics resp. good charts allow our brains to automatically interpret relationships between objects, allowing for almost instant comprehension with minimal effort.

1.2 Past and presence of visualizing

Before looking at the future of visualizing information we look at some examples of past and present ways of communicating quantitative business data. In section 2 we will look at future concepts.

1.2.1 Past

1.2.2 Presence
Since the beginning of this century great new ways and technologies have been developed to visualize great amounts of data but the average PowerPoint presentation, management report, and annual report still use visuals with highly cluttered and often pure decorative visuals with low information density.

Figure 1: Examples of “Visualizing information” (Google picture search)

1.3 Business communication is not only about reports and presentations
Here we want to look at formal reports, presentations, and dashboards with mostly quantitative (financial) data. For executives though, informal qualitative data such as telephone calls, meetings, and personal discussions are often more important in daily business because they give interpretations, background information, and personal opinions such as suggestions, recommendations, warnings, etc.

Figure 2: Several examples for incomprehensible presentation slides
1.4 Notation standards in other disciplines

The Oxford English Dictionary defines notation as “a series of written symbols used to represent numbers, amounts, or elements in something such as music or mathematics”. Many disciplines already use notation concepts successfully and many notation standards have international significance.

One of the best-known – and oldest – notation concepts we find in sheet music. Music notation uses written symbols to represent melodies. Developed in Europe during the Middle Ages, comprehensive music notation has been adapted to many kinds of music worldwide.

![Figure 3: Section from a Bach Suite BWV 1067.](image)

Cartography also uses international standards in crafting maps that represent the Earth upon a flat surface. Road maps, perhaps the most widely used maps today, are a subset of navigational maps, which include railroad network maps, like the well-recognized map of the London transport system.

![Figure 4: London Tube map.](image)

Many different notation systems exist in engineering. International standards became highly important at the beginning of the Industrial Revolution. Today the International Organization of Standardization (ISO), founded in 1947, promotes worldwide industrial and commercial standards. Electric circuit plans represent a typical example of an engineering standard.
We find other important notation concepts in mathematics, physics, sports, chemistry, biology, computing, etc.

ISO asserts, “International Standards bring technological, economic and societal benefits. They help to harmonize technical specifications of products and services making industry more efficient and breaking down barriers to international trade. Conformity to International Standards helps reassure consumers that products are safe, efficient and good for the environment.” (iso.org).

Many disciplines obviously benefit from standards and the time is ripe for business communication to do likewise.

2 Future visualization concepts will be based on standards

Business communication covers all aspects of verbal (oral) and written (visual) conveyance of business relevant information. This communication can be of both formal and informal nature. Formal communication follows a predetermined and consistently applied structure (e.g. monthly reports and project status presentations), whereas informal communication lacks formal rules. The standardization of notations discussed here only affects the formal written part of business communication as it applies to reports and presentation material.

We focus on how to create charts, tables, texts, and pictures, which relate to report pages, statistics, dashboards, and other communication products supporting management’s decision making.
2.1 The need for notation standards in business communication

Assuming that well-informed managers make better decisions, business communication should strive for transparency. Providing transparency means supplying correct, complete, and comprehensible information at the right time from a trusted source.

The following three charts show how non-transparent representations of the same data can convey completely different and even misleading messages.

The first figure shows Net Sales from 2011 to 2014 and conveys a positive message: An average annual growth of eight percent.

The next figure shows the same Net Sales figures, but now with the time frame extended from 2006 to 2014 and adjusted for inflation and currency effects. In contrast to the figure before, it conveys a negative message: 2014 will be the least successful year in Net Sales since 2006.
Introducing notation standards for business communication increases transparency in two ways: comprehension and credibility.

**Comprehension**
These notation standards facilitate the understanding of reports and presentations by establishing rules for their conceptual and visual design. It is easier to understand reports and presentations with

- a clear message,
- a well-structured storyline,
- the same look for like objects, and
- higher information density.

**Credibility**
These notation standards help increase the credibility of reports and presentations. Decisions come easier when not hindered by deliberately incomplete information and misleading visualizations.

### 2.2 The principles of the IBCS® Standards

Business Communication meets the IBCS Standards if it complies with the three rule sets comprising the three pillars of IBCS: conceptual rules, perceptual rules, and semantic rules. An additional section devoted to the “Communication of messages” will follow in a future version of the IBCS Standards.

**Conceptual rules** help to clearly relay content by using an appropriate storyline. They correspond with the SUCCESS rule sets SAY and STRUCTURE based on the work of authors such as Barbara Minto [1]. Their wide acceptance stems from their scientific, experimental, and practical experience basis.

**Perceptual rules** help to clearly relay content by using an appropriate visual design. They correspond with the SUCCESS rule sets EXPRESS, SIMPLIFY, CONDENSE, and CHECK, based on the work of authors such as Gene Zelazny [4] and Edward Tufte [5]. Again, the wide acceptance of these rules stems from their scientific, experimental, and practical experience basis.

**Semantic rules** help to clearly relay content by using a uniform notation (IBCS Notation). They correspond with the SUCCESS rule set UNIFY based on our work other IBCS Association contributors. As they are manifested by convention, rather than scientific or practical experience, semantic rules must first be more widely accepted to become a standard.

The suggested **IBCS Notation** covers the semantic unification of terminology, descriptions, dimensions (measures, time periods, scenarios, etc.), analyses, and indicators in Business Communication.
Based on the general rules of the IBCS Notation, individual style guides have been developed. These style guides use different interpretations of the suggested notation concept referring to colors, line thicknesses, fonts, etc.

3 Conceptual rules

Conceptual rules help to clearly relay content by using an appropriate storyline. They largely correspond with the HICHERT® SUCCESS rule sets SAY and STRUCTURE based on the work of authors such as Barbara Minto [1]. They owe wide acceptance to their scientific, experimental, or practical experience basis.

3.1 SAY: Convey a message

SAY covers rules for conveying a message. Every report and presentation should convey a message. To do so requires an introduction to the theme as well as credible evidence supporting the message.

3.2 STRUCTURE: Organize content

STRUCTURE covers rules for organizing content. Content should follow a logical structure. Corresponding elements should be homogeneous and exhaustive without any overlap.

Figure 9: Cartoon: Not uniform – not mutually exclusive – not exhaustive

Figure 10: Good and bad structures on a dashboard
4 Perceptual rules

Perceptual rules help to clearly relay content by using an appropriate visual design. They largely correspond with the HICHERT®SUCCESS rule sets EXPRESS, SIMPLIFY, CONDENSE, and CHECK based on the work of authors such as William Playfair, Willard Cope Brinton, Gene Zelazny, Edward Tufte and Stephen Few. Again, these rules owe wide acceptance to their scientific, experimental, and/or practical experience basis.

4.1 EXPRESS: Choose proper visualization

EXPRESS covers rules for choosing the proper visualization. Those diagrams and tables, which convey the desired message along with the underlying facts as quickly as possible, should be selected.

Figure 11: There are better ways than using pie charts…(Source: Allianz group, Annual Report 2006)

Figure 12: …e.g. a series of stacked columns
4.2 **SIMPLIFY: Avoid clutter**

SIMPLIFY covers rules for avoiding clutter. All components and characteristics, which are too complicated, redundant, distracting or merely decorative, should be avoided.

Figure 13: Column charts before simplification… (Source: HICHERT+FAISST)

Figure 14: …and after simplification
4.3 CONDENSE: Increase information density

CONDENSE covers rules for increasing information density. All information necessary to understanding the content should, if possible, be included on one page. Doing so requires good utilization of space and small yet easily recognizable objects and elements.

![CONDENSE Diagram](image1)

Figure 15: Same report as before with increased information density (Source: HICHERT+FAISST)

4.4 CHECK: Ensure visual integrity

CHECK covers rules for ensuring visual integrity. Information should be presented in the most truthful and the most easily understood way possible, avoiding improper scaling, manipulated representations and misleading visuals.

![CHECK Diagram](image2)

Figure 16: Wrong visual perception due to cut value axis (Source: DER STANDARD 2008-03-12, page 14)
5 Semantic rules (UNIFY)

Semantic rules help to clearly relay content by using a uniform notation (IBCS Notation). They largely correspond with the SUCCESS rule set UNIFY (“Apply notation standards”). As they are manifested by convention, semantic rules must first be more widely accepted to become a standard.

UNIFY covers rules for applying notation standards. Things that means the same should look the same. This rule applies to all content, be it terminology, measurements, analyses, highlighting, etc.
Figure 19: Variance waterfall chart following the suggested IBCS notation
(Source: HICHERT+FAISST)
Applying the rules of HICHERT®SUCCESS will make a report or presentation compliant with the International Business Communication Standards (IBCS).

6 IBCS

Figure 20: IBCS Top Ten
SUCCESS rules and IBCS standards are published for free use and community discussion under the Creative Commons Attribution Share-Alike 4.0 International License (CC BY-SA), see [www.ibcs-a.org](http://www.ibcs-a.org).

![IBCS Standards](http://www.ibcs-a.org)

Figure 21: Public standards on www.ibcs-a.org

Choose a SUCCESS seminar on [www.dates.hichert.com](http://www.dates.hichert.com). Order your PDF copy of the IBCS Standards or a IBCS WITH SUCCESS poster from [www.hichert.com/onlineshop](http://www.hichert.com/onlineshop).

![IBCS Standards (pdf) and Notation Manual (pdf, ppt)](http://www.hichert.com/onlineshop)

Figure 22: IBCS Standards (pdf) and Notation Manual (pdf, ppt), see [www.hichert.com/onlineshop](http://www.hichert.com/onlineshop)

7 Practical benefits of IBCS notation standards

The benefits of notation standards for traffic signs, chess moves, weather maps, and many other disciplines are obvious. They have been used for a long time and nobody would argue against the advantages of these standardizations. But business communication stands apart it: Enforcement of "corporate design standards" seems to trump enforcement of "standards for meaning". In general though, business people want to understand the economic benefits of change – installing new rules, new reports, and new software – preferably expressed in financial terms, necessitating not only an overview of necessary investments (relatively straightforward), but also a calculation of the expected merits, such as better-informed executives and faster report production processes.
We want to view this problem through the matrix in the table below, in which the horizontal section represents the process to support decision-making and the vertical section examines the fundamental types of expected benefits.

The process to support decision-making consists of the following three stages:

(A) Provide data and systems: This stage deals with providing correct, useful, and timely data as well as appropriate systems for analyzing and reporting. IT departments typically executed this stage.

(B) Analyze data and create messages: In this stage, the data is to be analyzed to create a clear view of the business status — a task the business analysts typically perform. The analysts will deliver their findings resp. messages in the form of reports and presentations.

(C) Evaluate messages and make decisions: In this stage, executives make decisions based on their evaluation of the reports and presentations.

Looking at these stages, we see three types of benefits arise from the implementation of notation standards in business communication:

(i) Improved quality: The quality of the deliverables in every process stage will increase, meaning more readily understood dashboards, more intelligible reports with clearer messages, and – ultimately – better decisions.

(ii) Reduced reaction time: The speed of the overall decision-making process will accelerate: shortened delivery times of new dashboards, allow business analysts to more rapidly answer questions, and executives to make sound decisions faster.

(iii) Reduced costs: The time saved in the delivery of dashboards, in the analysis of data, and in the creation of reports and presentations will reduce costs. But reducing the time executives spend trying to understand reports will be the biggest advantage.

<table>
<thead>
<tr>
<th>(i) Improved quality</th>
<th>(A) Provide data and systems</th>
<th>(B) Analyze data and create messages</th>
<th>(C) Evaluate messages and make decisions</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>(ii) Reduced reaction time</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>(iii) Reduced cost</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
</tbody>
</table>

Figure 23: 3x3 matrix to discuss the benefits of notation standards in business communication

In the last several years, we have discussed the nine quadrants in the table above with numerous participants of our seminars, with customers, with business consultants, and with software vendors.

7.1.1 @ 2 and 3: Improved quality in analyzing data and making better decisions
To our minds, this is the key success factor in applying these rules. If the readers of reports and the audience of presentations better understand what is being said, they have a clearer understanding of the facts and can therefore come to better decisions.

7.1.2 @ 4: Reduced reaction time in providing data and systems
We can measure the reaction time stemming from a higher degree of standardization is relatively easily. We have talked to people who were able to reduce the production time of their reports from two days to a few hours thanks to standard layouts.

7.1.3 @ 7: Reduced cost in providing data and systems
Reducing reaction time in providing data and systems in general will also reduce time related cost. Moreover, using the same templates for different reports, dashboards, and PowerPoints certainly reduces the complexity and also minimizes mistakes.

7.1.4 Implementation costs and investment decision
In general, the benefits described above can only be achieved through a one-time investment in the development of an individual notation concept, the evaluation and installation of software, as well as training, consulting, and –
of course – the redesigning of reports, presentations, dashboards, etc. One must quantify both these implementation efforts and the benefits mentioned above in order to make a sound investment decision.

8 Analytical software compliant with the IBCS® standards

Analytical software packages assist today’s process of creating reports and presentation material substantially. Though the most important part in report creation, namely the finding and formulation of the message, remains the intellectual work of the analyst, software support is essential for the overall process. Software ensures the provision of data, supports the analysis of business figures, and in the end helps the analyst to design charts and tables supporting the message he wants to convey.

With regards to notation standards the visualization aspects of that process are of interest, i.e. the design of interactive dashboards for the analysis phase and the design of static reports and presentations illustrating a specific message. To put it clearly: the practical implementation of notation standards for business communication will only be possible if the analytical software package in use supports them.

But how can you know if an analytical software package can produce HICHERT®IBCS-compliant charts and tables? As long as it is not common practice for all analytical software packages to support the HICHERT®IBCS notation standards, we must honor the ones that do. To this end, the IBCS Association joined forces with BARC, the Business Application Research Center, to set up an appropriate evaluation and certification process in January 2014.

The evaluation is carried out in two stages:

- Compliance with HICHERT®IBCS: Software providers prove compliance by creating predefined HICHERT®IBCS-compliant templates (see www.certification-templates.hichert.com) in the BARC lab using the software in question and we evaluate these templates created with their standard software using transparent criteria, which relate to the notation of business meaning and the design of report components described above.
- Ease of use: The second stage concerns not achieving the highest possible level of compliance with the predefined templates, rather the ease of use creating the initial templates as well as in subsequent changes to them. The evaluation represents a measure of the level of user satisfaction anticipated.

SAP is one of the first vendors of analytics software to be interested in HICHERT®IBCS certification. Paired with their early internal adoption of HICHERT®IBCS in the SAP finance department, this certification interest expresses a strong commitment by SAP to the International Business Communication Standards (IBCS). In April 2014, BARC confirmed the ability of SAP BusinessObjects Design Studio 1.x with graphomate charts 2.x to create charts compliant with the notation standards of HICHERT®IBCS. The presentation clearly showed that graphomate charts for SAP BusinessObjects Design Studio were specifically designed to create HICHERT®IBCS-compliant charts. And the speed with which completely new charts were produced as well as the flexibility in applying various analyses was amazing.

9 Outlook

The advantages of notation standards in business communication are evident: Deeper analytical insight means better decisions; faster analysis and decision making; less time and money spent not only creating interactive dashboards but also for analyzing and understanding reports and presentations. Above all, enterprises move one step further towards an information-driven culture, which allow for an even stronger adoption of analytics across the organization.

But one thing remains to be achieved: The greater the organizational scope of application (e.g. my report - my department - my company - the whole world), the greater the benefits of notation standards. For this reason we must strive to make IBCS a truly worldwide standard in all fields of business communication. International Business Communication Standards will help decision-makers across the globe understand internal and external reports and presentations better and faster without ambiguity.

The adoption of IBCS® notation standards by software vendors will dramatically accelerate its dissemination. Perhaps in years to come, it will be a matter of course to have notation standards in business communication, as has been the case in music and cartography for hundreds of years.
Literature
