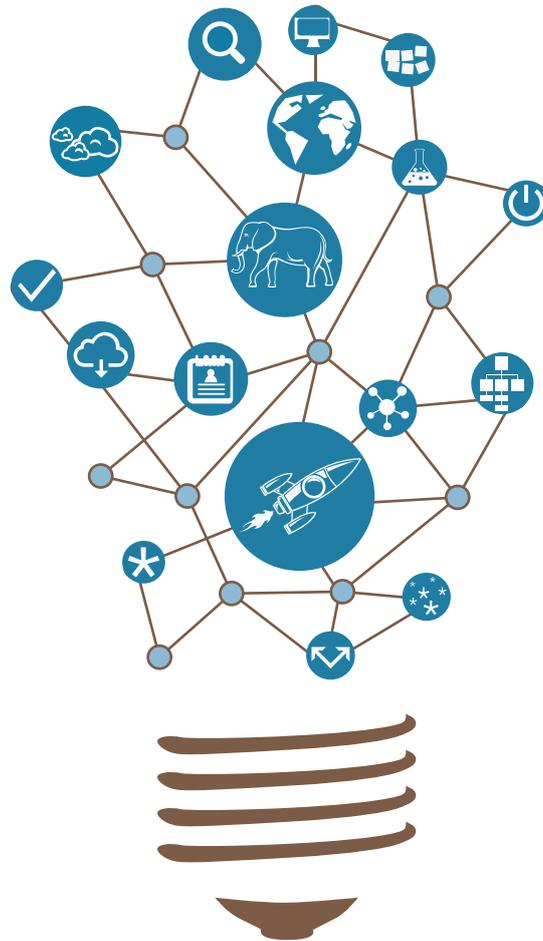


Data Thinking: A guide to success in the digital age

How to become a sovereign data enterprise – step by step



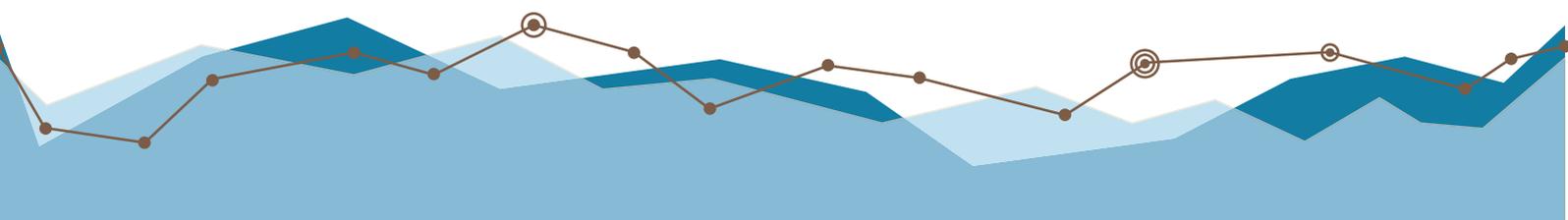
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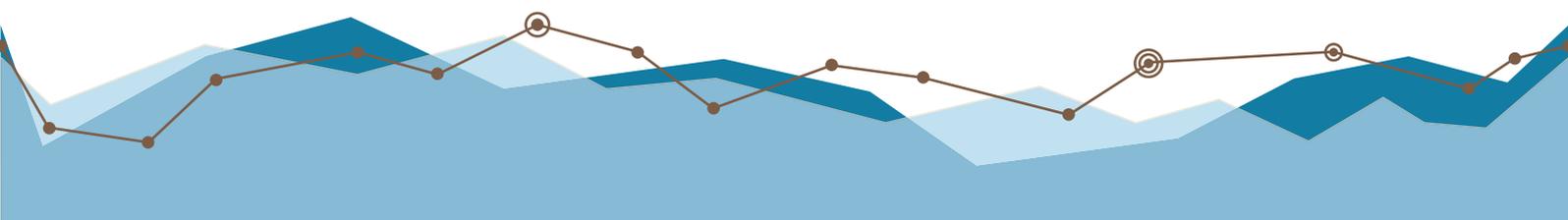


**Hewlett Packard
Enterprise**



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New digital realities & new objectives for companies

In the shortest of timeframes, technology, data, and data use have changed the world. Whether in purchasing behavior, medicine, communication, transport, logistics, or production, new digital realities are being born all around us – and increasingly, these realities are data realities. The rapidly escalating trend is showing no signs of slowing down. This digital shift will have an enormous impact on the economy and on companies of all sizes, in all industries.

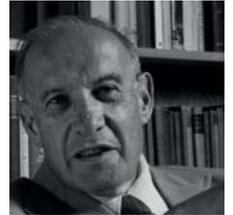
Market challenges:

- ★ New terminology, trends, and technologies make orientation more challenging
- ★ Newcomers to the market and competitors place existing positions and positioning at risk
- ★ The new generation of customers (Digital Natives) has a brand-new and completely unique set of communication and consumption behaviors

For many companies, it's difficult to keep up with the pace of the digital shift. Often, companies act too slowly and follow existing thought patterns that are now no longer fit for purpose.

“The greatest danger in times of turbulence is not the turbulence; it is to act with yesterday’s logic.”

– Peter F. Drucker (Economist)



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Company challenges:

- ★ Lack of expertise & trained employees
- ★ New terrain & little experience
- ★ Fear of risks & making the wrong decisions
- ★ Responsibilities not clearly defined (business or IT); complex decision-making processes (particularly in large companies) & cultural deficits within companies

A new way of thinking and acting

Most companies are driven by digitalization pressure rather than a desire to take control of their own Digital Development. They know *that* they need to act, but they don't know *how*. Founded and formed in the analog age, it's natural that they lack the skills, routines, and experience to put themselves on the path to successful digitalization.

External consultants can only help to a limited extent: partly because they, too, are often children of the analog age, applying the same kinds of outdated logic as the companies themselves. To compound the problem, consultants usually only look at the company top-down, from a global market and business perspective – without gaining any specific bottom-up insight or hands-on project and practical experience with the data realities that the company faces.

To complete their Digital Development journey successfully and develop an individual strategy to tackle their own specific challenges, companies need modern ways of thinking and acting – the “logic of today and tomorrow.”

We call it Data Thinking.



“Data Thinking is the first skill that a company needs to position itself as a digital leader.”

– Klaas W. Bollhoefer
(*um Chief Data Scientist & Data Thinker)

Data Thinking: A holistic approach to data and data use

Most decision-makers in companies are already familiar with targeted and value-generating data use, and understand that a move in this direction is crucial. Many companies have already populated their own data pools and may have even completed some initial pilot projects. They may have installed a Hadoop cluster, attended conferences and training courses, or even set up a lab, completed initial proofs of concept, and commissioned or hired their first Data Scientists. But in spite of all this, most decision-makers involved in Big Data planning are still only thinking about the basics:

- **Data**
- **Algorithms**
- **Technology**

These basic factors alone reach nowhere near far enough to integrate Big Data, analytics, or even just data itself into established company areas and processes. Other key factors include:

- **Strategy & Leadership** / Organizational setup, scope to shape and make decisions, pioneer in the world of data
- **Skills & Roles** / Skills and competence to think from a “data perspective” and newly defined responsibilities and redistribution of tasks within teams
- **Culture & Routines** / Thinking from a “data perspective” and being open to new approaches, a modern company culture and agile working methods
- **Operational Model & Processes** / Close collaboration between affected departments, continuous communication, defined interfaces and processes, “provisioning” rather than demand/supply
- **Community & Research** / Networking, engagement, and time for ongoing development and exchanging experiences

A bridge between business and IT

In recent years, the digital shift has probably become the most critical factor in the success and continued existence of most companies. Management needs to make the digital shift its business – and it needs to be a top priority for all involved.

Data Thinking bridges the gap between innovation, strategy, and the operational business units in business and IT. The finely tuned interplay between all of these areas is the key to Digital Development truly clicking into place. It's what ensures the long-term success of individual data initiatives. It opens the door to the step-by-step transformation of the company into a Data Enterprise. It is the key to the full integration of data, algorithms, technology, and a whole new mindset (which we consciously don't define here) across your company.

Data Thinking represents a break away from what we know. **This new, holistic way of thinking and acting is highly business-relevant** and changes company culture. It calls time on old habits such as passing digitalization down the line to IT; it builds interfaces and encourages exchange and collaboration between departments.

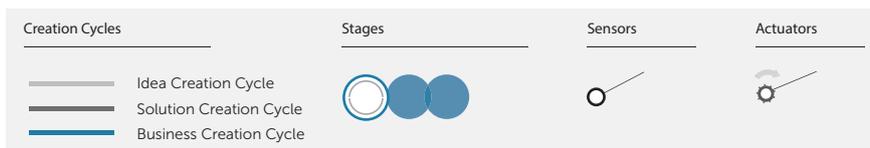
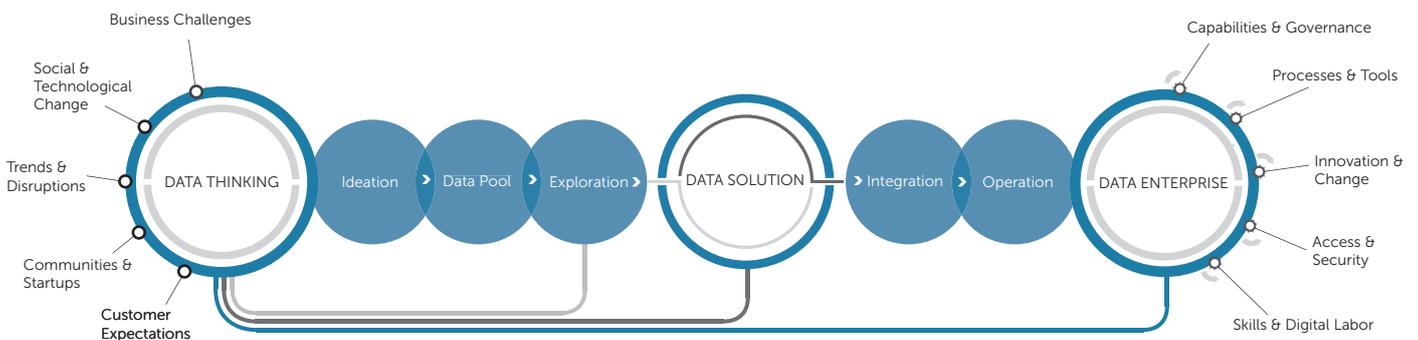
The shared objective across the company is to put yourself in the driving seat, take control, and consciously manage your own Digital Development, rather than simply responding to the market and the competition.

Guidelines & orientation: The Data Leadership Process Model (*umDLPM)

This practical and proven model is a **navigational tool for companies on the Digital Development journey**. It encompasses the entire process chain, uniquely combining all relevant components by integrating data, algorithms, technologies, and other factors (mindset) into a new, holistic way of thinking and acting.

DATA LEADERSHIP PROCESS MODEL

Data + Algorithms + Compute + Mindset



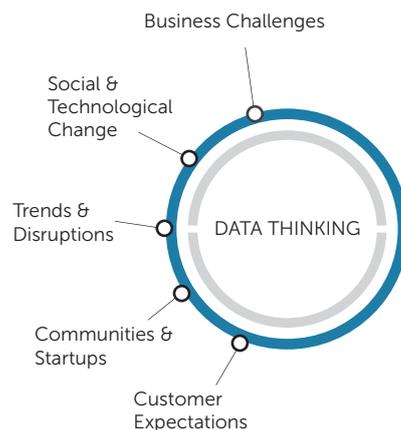
The model is structured as a mechanical 'workflow', similar to those used in robotics – with sensors (left), actuators (right) and “the logic of today and tomorrow” at its heart.

The model divides the entire process of data-driven Digital Development into clearly defined phases:

- **Data Thinking** / Basic thinking and learning
- **Data Solution** / Specific examples and potential
- **Data Enterprise** / Targeted implementation in the organization

Data Thinking: Successful digitalization starts before the process itself

As the model shows, Data Thinking is the starting point for all Digital Development. This is a bidirectional process, with new ways of thinking and acting rooted long before the start of specific data projects.



On an internal level, companies must consider and develop an understanding of what kind of role data, algorithms, new technologies, and, last but not least, a new mindset could play in their business in the future. This process implies that they must be open to new ideas, approaches, and methods.

They also need to look at what's going on externally, too. Companies must deploy their "sensors" to pick up on relevant factors outside their organization. These factors include technical and scientific changes taking place in the market, in their own sector, and in customer and buyer behavior, disruptions and start-up trends and, last but not least, bottom-up developments in the scores of data, tech and open-source communities. These factors all need to be internalized into the thought processes and knowledge within the company.

Open to new ideas, inspiration and “logic hacking”

Above all else, employees need time and space to be inspired and learn new things: new methods and routines and the skills and mindset they need for the worlds of Big Data, open source and artificial intelligence. They need to be able to question how things are being done and be given targeted opportunities to “hack”.

To achieve this, employees must become active participants in communities, living and breathing “startup spirit” and taking part in conferences and meet-ups. They must be given the chance to try out new technologies and tools in order to get to grips with the opportunities that digitalization brings for the company and to utilize these to their fullest potential.

Measures & support:

- ★ Continuous topic & trend monitoring
- ★ Participation in & input into specialist conferences, ideation workshops & community events / hackathons
- ★ Testing & evaluation of new tools and technologies
- ★ Space & scope for own projects

“The problem is that at a lot of big companies, process becomes a substitute for thinking.”

– Elon Musk (Entrepreneur)



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Case study: Pop-up data lab

- ★ **Project:** Construction and operation of a temporary data lab for an international retail company
- ★ **Team:** Cross-functional team of experts from the customer's company and from *um, links with international experts from the relevant tech communities
- ★ **Scope:** Determining and implementing new ways of thinking and acting, collaborative planning and development of use cases / proofs of concept (PoC), testing of and familiarization with new technologies and tools, hands-on machine learning / artificial intelligence
- ★ **Results:** Rollout of first data solution projects, go-ahead to design a company-wide data and analytics hub

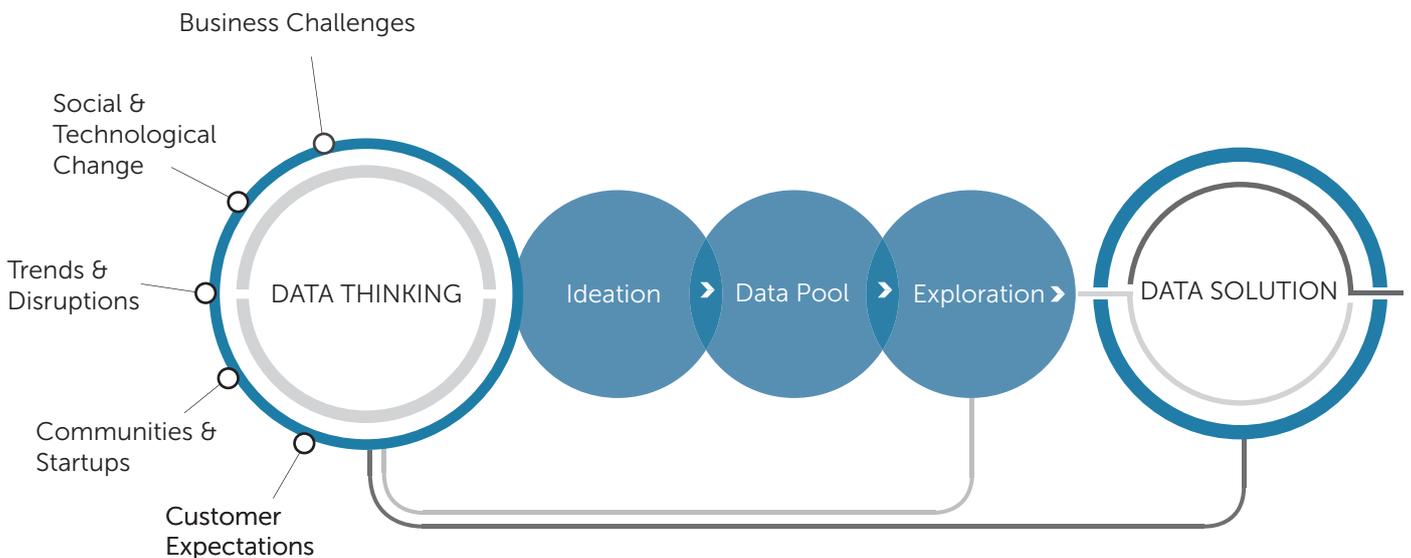


From Data Thinking to Data Solution

The initial phase is followed by specific development steps and cycles that pave the way to actual applications and solutions – the Data Solution itself.

This constructive phase is characterized by practice-relevance and usability. Using conventional consultancy approaches and methods, the result might be, for example, confirmation that a data case is feasible and an indication of how it could work. However, the whole process grinds to a halt after the prototyping or proof of concept stage.

In contrast, Data Thinking goes much further. Rather than setting prototyping as the objective, it focuses on product maturity from the outset; use and application are considered as the next step in the process chain throughout.



Data projects pass through three phases of development on the journey from Data Thinking to Data Solution:

- **Ideation** / Question and use case definition
- **Data Pool** / Data recording and consolidation
- **Exploration** / Data evaluation and application development

Prototypes and proofs of concept are still developed during the initial stages of the development cycles. These tools are used to validate whether a data case actually works (Idea Creation Circle). If the outcome is positive, the data case is then transferred to real products and projects (Solution Creation Circle).

The aim of this phase is to identify solutions for the business that can be used to generate specific Business Value from data.

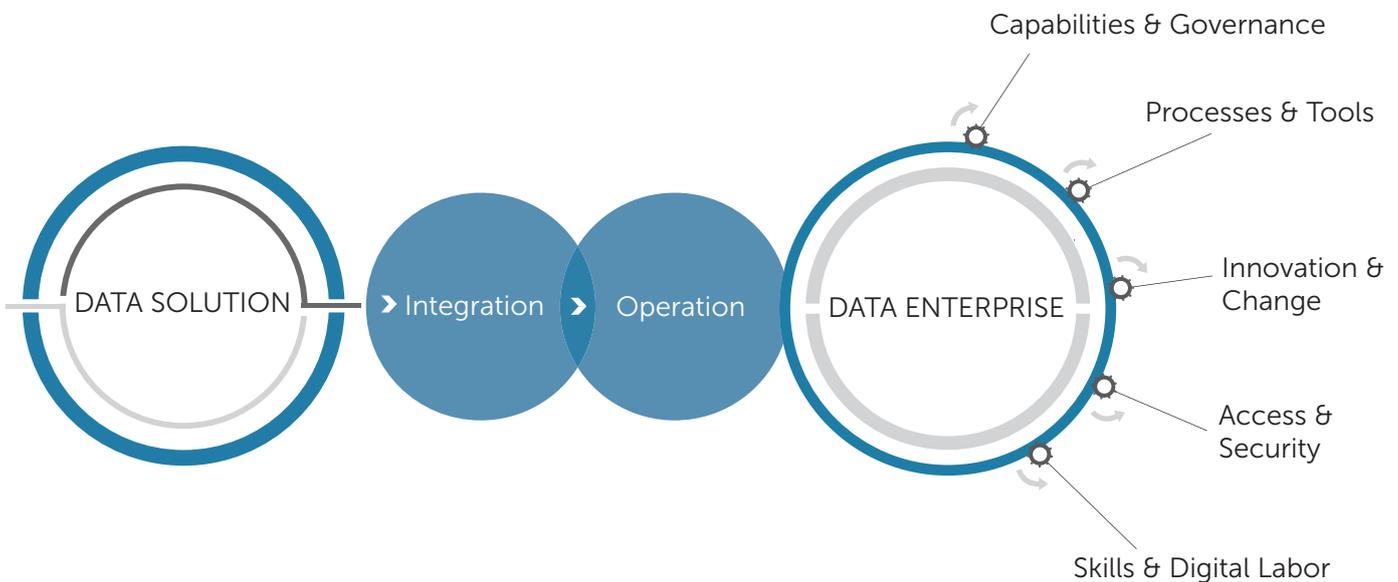
Measures & support:

- * Regular proof of concept development
- * Exchanging knowledge, peer & code reviews
- * Operational support and guidance

From Data Solution to Data Enterprise

Through to the final development phase, Data Thinking continues to provide a framework for the model. This is where the integrated process chains are brought to a close and implemented.

These phases involve the integration and operation of the Data Solutions. At this stage, the company starts implementing the relevant resources, tools and/or processes inside the organization, guided by the actuators on the right-hand side of the model.



The key to understanding and successful implementation? The fact that this Business Creation Circle happens not just once, but over and over again.

Each and every new Data Solution adds a new building block. Step by step, facet by facet, the individual “Data Maturity” of the company is constructed. Each new project brings new knowledge and expertise; technologies are comprehended, integrated, and rejected; processes are refined, and skills and capabilities are continuously expanded – step by step generating new Business Value.

The aim of the entire process chain is the development of a digitally sovereign, continually developing company: the Data Enterprise.

Measures & Support:

- ★ Strategic support & continuous advice
- ★ Design, construction, and operation of (temporary) lab spaces
- ★ Capability assessments, data roadmaps, & (technical) concepts (human-data interfaces, data lakes, data and system architectures etc.)
- ★ Data bootcamps, sounding boards, & CxO one-on-ones

Case study: Data Thinking @ C-Level

- ★ **Project:** Capability assessment and development of a data maturity roadmap for an international retail holding
- ★ **Approach:** Workshops and individual interviews with business units and IT;
*umCapabilityAssessment – unique model for the evaluation & analysis of operational and organizational skills and competencies within a company (data, algorithms, technology, mindset), fit gap analyses, determination of key insights and recommended actions
- ★ **Results:** Identification and prioritization of recommended actions, data maturity roadmap (planned for 24 months)

“There are no best practices out there – just practices to learn from and get inspired by.”

– Florian Dohmann
(*um Senior Data Scientist)



Conclusion: Recipes for success are individual

This whitepaper bears the title **Data Thinking: A guide to success in the digital age**. It certainly fits the bill – but this is not a one-size-fits-all concept. There is no universal path to success.

Each and every company has its own specific requirements and objectives – and every company must make its own individual journey to digital sovereignty, based on Data Thinking and regularly working through the Data Leadership Process Model.

To get off the ground with Data Thinking – to initiate the new mindset and kick start digital development – **you need the right starting point and the right process to follow. You need up-to-date advice on data, algorithms, technology, and mindset.** Not traditional strategic and organizational advice, but advice from experts who can offer specific guidance as you make your own way.

The key is to bring this experience and competence into your own company and integrate it (bottom-up) in your strategic development process, planning, and implementation. Ideally, the experts you consult will already have built teams, implemented projects end to end, tested routines, generated practices (hands on), and selected tools and system solutions. They will have learned from their mistakes and successes and built a wealth of experience, and will be in a position to share their knowledge in a competent, targeted way.

Embark on your Data Thinking journey now.

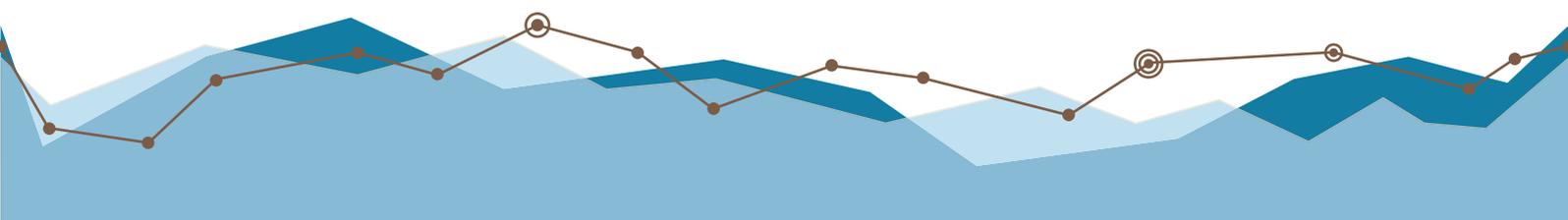
Hewlett Packard Enterprise (HPE) has been innovating for over 75 years. The successful global technology company is a market leader in the server, memory, networks, convergent systems and software sectors.

Technologies, applications, and services from HPE support organizations of all sizes in transforming their traditional technology platforms to IT systems of the future. HPE helps companies to respond quickly and flexibly to a rapidly changing competitive landscape, roll out innovations, stay competitive, and swiftly convert ideas into value.

Whatever integration stage a company is at, HPE offers the technologies and solutions needed to make their efforts a success. HPE's solutions enable organizations to meet shifting demands, so that they can take the lead in today's marketplace of disruptive innovation.

Weitere Informationen:

www.hpe.com



The unbelievable Machine Company (*um), based in Berlin and Vienna, specializes in Big Data and Cloud Services. Founded in 2008, *um is a full service provider covering all aspects of a project, from the initial idea through to implementation: including advice, planning, technical integration, operation, and 24/7 service. With over 120 employees, *um develops precision solutions to tackle the individual business challenges of renowned customers such as Deutsche Post, Gebr. Heinemann, the Metro Group, Porsche, Parship, and ProSiebenSat1.

*um splits Big Data into four areas: Data Thinking, Data Science, Data Engineering, and Data Operations. All of these areas together form a holistic approach and create a hotbed of ideas for the digital world in which we live. Structured to think globally, *um supports companies on their individual Digital Development journeys and creates pioneering solutions and services. The company has already won many awards for its work, most recently winning the title of “Big Data Leader” from the Experton Group for the second time.

***um service offerings (selection):**

- ★ Individual strategic advice & support
- ★ Data bootcamps, custom training, & ideation workshops
- ★ Capability assessments, fit gap analyses, & development of data roadmaps
- ★ Design, construction, operation, and review of data & innovation labs
- ★ Development of proofs of concept, data solutions, and data and system architectures

