

# Change management for Watson

*Helping increase the success rate of cognitive implementations*



## Introduction

Cognitive computing solutions, like IBM® Watson®, are defining a new era of radical and continuous change. In order to follow or even outsmart the competition, it is key to be aware of the possibilities of cognitive computing and to make the right decision where to invest. For such an important investment you want to make sure that it is successful and adopted by the organization. This surely is not something you can take for granted. We have seen a Watson implementation where, despite the perfect technical solution, less than 20 percent of the employees were using Watson.<sup>1</sup> If you are not able to make your initial Watson implementation an overall success, you risk missing the cognitive boat.

Watson is changing organizational fundamentals as processes, governance and ways of working. In order to cope with these changes, organizations need to pay specific attention to cultural change, change leadership and a coherent approach of change management. Change management is not only essential during the adoption of Watson in the organization, it is just as important even before starting a Watson implementation.

In every Watson project there are four sequent focus areas that require change management attention: Understand, Teach, Adopt and Improve Watson. In this paper, we will help you to understand the value of change management and how to apply change management activities in each of these focus areas.

## The cognitive era

Industrial revolutions have at least one thing in common. They all started with a disruptive invention changing the relationship between people and technology. In the 18th century, the invention of the steam engine by James Watt transformed the production of goods by mechanizing the labor work of craftsman and revolutionized the industry. Arriving in the era of cognitive computing, we are at the tipping point of yet

another revolution that will affect the knowledge worker at all levels of the organization. Most inventions that influence the lives and jobs of people will trigger controversial reactions in society. Those who see it as a blessing and opportunity will embrace the technology but others will feel threatened not knowing whether their job will become obsolete or fundamentally change. In the following chapters, we will describe how the cognitive technology of IBM Watson will impact the relationship between technology and the knowledge worker, and we will evaluate the implications for the change leaders who are required to successfully introduce, implement and maintain IBM Watson in organizations.

## What is cognitive computing?

The beginning of the 21st century can be considered as the start of the cognitive era and a new era of computing as we know it. What makes cognitive computing different from programmatic computing? In general there are three main characteristics that distinguish cognitive systems from programmed systems, including:

- Understand and interact via natural language
- Generate hypotheses and evaluate them based on relevant evidence
- Learn and get smarter with each iteration and interaction with humans and other machines

Until recently people had to adapt to interact successfully with technology as it was often rigid and relied on human intervention. Programming was required so that the technology knew what to do and in which order. With the capability to understand natural language, people can interact in a more natural way with technology as opposed to programming them. Thereby there is less need to adapt the user interface of the technology, making it a real paradigm shift. Another characteristic that will change the relationship in a fundamental way is that machines will develop intelligence that resembles the way people think, decide and learn.

Through machine-learning algorithms, cognitive technology is enabled to reason and make recommendations for decisions that become more precise after every new iteration and interaction. Machine learning algorithms perform basic cognitive reasoning tasks like searching for information, comparing information and making logical inferences. It is the combination of natural language processing, machine-learning algorithms and the processing capabilities of computers that make the new generation of cognitive systems extremely powerful.

But what does this mean for the user of this technology? Are they willing to interact with technology that can prove tireless, can consume vast amounts of structured and unstructured information, can reconcile ambiguous and even self-contradictory data, and can learn? Technology that will outperform humans on a growing number of cognitive tasks like information retrieval and information processing? The partnership between people and technology will be more effective than either one alone. There are multiple examples of specialists whose job it is to analyze complex problems and make decisions how to best solve them. These examples vary from the oncologist who looks for the best treatment for his or her patient, to the judge who decides on the verdict based on the available evidence, to the mechanical engineer on how to

repair your car. We will discuss how to involve the specialist and build trust so that the specialist is willing to accept the cognitive system to assist in further improving the quality of the specialist's decisions.

### IBM Watson 'the making of an expert'

Nobody is born as an expert. Only geniuses can become experts in early life when their talent is recognized and nurtured like Wolfgang Amadeus Mozart who composed his first compositions at the age of four. Most experts however earned their title by studying a subject matter and practicing their skills for many years. Cognitive technology develops along the same lines as an expert. Unlike humans, cognitive technology starts as a 'blank slate' as it has no knowledge of what domain will be used for training purposes. As mentioned earlier, it has the required capabilities to understand language and learn from experience, but it needs to be educated and taught what is possible and what is not. In terms of cognitive computing domain, experts play an important role as teacher to train the system to understand the collection of information for a certain domain. These experts decide which collection to use and which parts of the collection are relevant to answer a certain question. Cognitive technology therefore requires ongoing education to stay relevant and stay in business.



Human



Watson

Birth		Untrained system
Uneducated	Little knowledge	Empty domain
Intelligence	Processing capabilities	Algorithms
Parents, teachers	Experts for knowledge and comprehension	SMEs
Books, videos, etc.	Content	Knowledge base
Learning by doing	Learns through interaction and from mistakes	Expert training
Aware of limitations	Indicates when not completely certain	Probabilistic
Gain experience	Continue to get better over time	Adaptive learning
Cognitive/analytical	May answer question differently than how it was trained	Cognitive
Expert		Expert

### The usage and impact of Watson on the organization

Being yet at the tipping point of this cognitive era, we slowly start to realize the endless ways and possibilities of using Watson within industries and organizations. The number of use cases is growing rapidly.

Almost all use cases are supported by a combination of one or more cognitive services (Ask, Explore, Discover, Decide and Visualize) that can be utilized across industry or department—Research & Development, Sales & Marketing, Manufacturing, and Customer Service. The development of cognitive solutions is more and more component based whereby an API, which executes a specific cognitive task is combined with other APIs. Small functional building blocks that can be mixed and matched in many different ways. For example for the Ask cognitive service, there are APIs available that perform tasks like Language detection, Machine Translation, Speech to Text and Q&A functions.

### The essential role of the subject matter experts

There is no doubt that cognitive technologies will impact organizations at all layers of the organization. However, the biggest impact in most cases will be on the Subject Matter Expert (SME). SMEs function as the knowledge brokers of the organization, cognitive technologies will impact their day-to-day activities in the way they gather information, explore different scenarios, discover outcomes, make decisions, reason on the quality of their advice, etc. Moreover, they are also the ones who will have a high impact on the success of cognitive solutions as Watson needs their input to learn, both initially and on an ongoing basis. Lastly, it is the SMEs that will function as the Watson ambassadors who will drive adoption across the organization.

Therefore, SMEs play an essential and vital role to the success of introducing and implementing cognitive technologies as IBM Watson within organizations. SMEs will have the most to win from Watson, but they could also feel most threatened by Watson. This will require substantial change management effort.



### Importance of change management

The “Making Change Work” study (2014) by the IBM Institute of Business Value (IBV) confirmed that disruption has become every organization’s constant companion. The ability to anticipate, manage and capitalize on pervasive change is often the difference between market leadership and extinction.

As cognitive technology changes ways of working, it is essential to acknowledge that it will have an impact on both the organization and its people. Considering the vital role of the SME, many of the change management activities will be focused on getting their involvement, adoption and support.

**74%** of respondents said that individuals in their organization are not fully prepared to adapt to an increasingly digital work environment, either online or offline.

An increasingly digital work environment and a new generation workforce is challenging hierarchical communications, skills and long-held beliefs about ways of working.

**For 88%**, a major focus over the next 5 years will be to leverage new technologies that make organizations more customer centric.

This poses a significant disconnect between the desire of leaders to embrace technology and their organizations’ structures, functions and ability to follow suit.

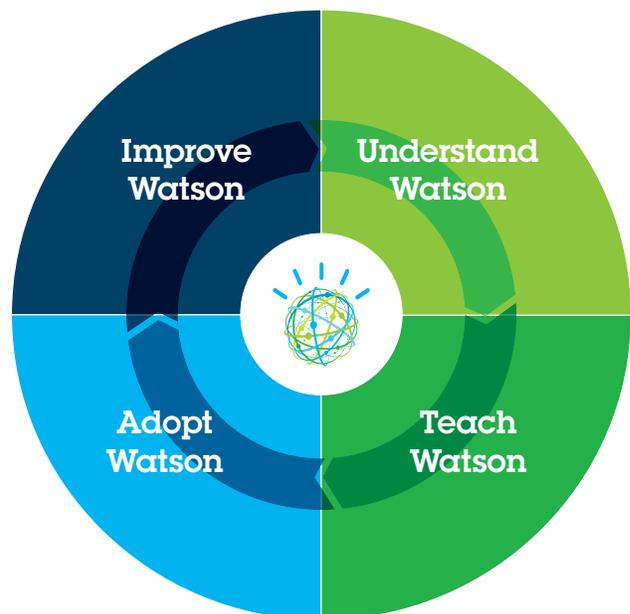
**77%** of organizations confirm that a major objective over the next five years will be to further integrate processes and technologies on a global scale.

This integration means massive changes and realignment within the C-Suite, and they must therefore closely examine how they and their teams interface with each other.

### Embarking on a journey with Watson

Based on our experience in Watson projects, we defined four Change Management focus areas:

- *Understand Watson* – Getting a clear vision and a shared understanding of Watson’s benefits and use cases
- *Teach Watson* – Careful selection of team of SMEs with the right quality and quantity, high commitment, an open team climate and sufficient management support
- *Adopt Watson* – Increase the adoption rate to the highest level possible by excellent change leadership and culture transformation
- *Improve Watson* – Implement a continuous improvement process, in which all users are engaged and have specific roles and responsibilities in relation to Watson



## 1. Understand Watson

Before starting a Watson implementation, there has to be a shared understanding in the organization of how cognitive computing and Watson fit in the business and the company strategy. What processes or activities can be enabled by Watson? Which departments or business units will be in scope? Which type of functions can benefit from Watson? In a Cognitive Value Assessment (CVA), current business workflows are reviewed and assessed, which results in a number of prioritized use cases, a benefits case and a journey map.

During the first stage of the Watson implementation, change management activities are focused on:

- *Engaging the entire organization in gathering ideas for potential Watson use cases and finding the most promising ones.* Developing the use cases can be realized through a CVA workshop but also a jam can be a powerful tool to elicit use cases. In a jam, leadership engages the organization, helping to create ideas for potential Watson use cases and rating various cases and scenarios. Jams are online collaborative discussions designed to allow focused audiences to, over a defined period of time, discuss critical business questions and collaborate on responses to these questions. Another tool that contributes to a more engaged organization is Dragons Den rounds of evaluation. The best use cases are selected

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*An electronics client used a Watson design thinking workshop with its services engineers to generate ideas for use cases, which after a business benefits and feasibility check could be voted for by the larger service community in a voting jam. Guided by a service engineer, a team of volunteers developed blue prints for the top three use cases. One was selected for prototyping.*

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and teams or individuals are asked to pitch their ideas and benefits case to a small jury of Watson Change Leaders. Dragons Den interventions engages people in an interactive way and makes them feel heard while shaping the future vision with Watson.

- *Deepening the understanding of changes to the organization based on these formed ideas and use cases.* What is the effect of Watson on:
  - *Processes:* Will Watson eliminate processes or steps in the process? Will it increase the quality of our process or our process outcome? Will it speed up new product development?
  - *People:* Will Watson allow us to use lower skilled resources for the same process? Will it allow us to leverage fewer resources for the process? Will we be able to outsmart competition with our expertise? Will it change our way of learning? Do employees need specific skills and capabilities to work with Watson? Do employees change their way of working or even change their mindset?
  - *Organization:* Will Watson encourage us to rethink our organizational model and ways of working? Less hierarchy? More cross-functional teams? End-to-end thinking? Will Watson fit in the organizational culture? Will Watson introduce new roles and responsibilities?
  - *Technology:* Can we be less dependent on other technology as Watson becomes our key system?
- *Supporting senior management to create a vision in which the value of Watson is clearly articulated.* A successful vision allows everyone to understand the benefits of Watson, it creates a common sense of direction and it motivates and helps people to focus on the goals of the Watson implementation. Social media tools can be used to develop, revise and share the vision more broadly in the organization. This also needs to point out clearly the case for change: why are we engaging Watson and what would happen if we do not use Watson. For example: we need to stay competitive, our costs are too high, or we need to be more customer focused.

## 2. Teach Watson

Still in an early stage of the Watson implementation, a team of SMEs will be formed that will train Watson. This team will have a vital influence on the quality of Watson's advice. There are many aspects that might negatively influence the input of the team, which can change a potential successful implementation into a flat out failure. What if the team of SMEs that teach Watson does not contain the right people? What if the team does not possess the necessary expertise? What if they fear Watson will replace them in the future? What if the experts most suitable to train Watson don't have time because they are those with the fullest agendas already?

The more we have to rely on the judgment of experts, which can be subjective, the more important it is to select the right team of experts who can work as a team together and foster a culture of openness, where different opinions can be shared and discussed in a rational way. If you want to optimize Watson's benefits and reduce risks of bias, you will need to carefully select the team of SMEs. You will have to make sure:

- The team is balanced and has the right quantity, quality and diversity of team members
- All team members are available and committed to teach Watson in the best possible way
- The team climate is open and allows different opinions
- Management has a clear vision and supports team members in terms of time and budget
- The entire group of SMEs feels represented by the team and has confidence in the team

In this stage of the Watson implementation, change management activities are focused on:

- *Defining the profiles and selecting the SMEs required to teach Watson.* This goes beyond their domain knowledge. Personality traits and personal preferences have to be taken into account to build a team of experts who can develop a virtual assistant that will be trusted and used by peer experts and end users of the system.

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*In creating a team to teach Watson, a large Telco company decided to select highly experienced call center agents and their team managers, who were dedicated to solving customer problems related to interactive TV. They collected all the questions over the last 12 months by analyzing their contact center logs. In calibration sessions, they evaluated and fine-tuned the answers based on available technical corpus as well as the logs and paired them with the questions. Another team was asked to test the solution. By investing much time and effort in teaching Watson, they came up with a valuable solution.*

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- *Commitment of the team as well as the organization is required for any organization that embarks on the cognitive journey.* The more the domain is driven by SMEs, the more dependent the organization will be of these scarce resources to develop and train Watson and foster the adoption of it in the organization. Ideally, being part of the Watson teach-team should be considered a privilege and therefore attract the best people.

### 3. Adopt Watson

Implementation of Watson is not just a technical challenge. It is a transformational challenge that will require people to work differently and change their way of decision making. Like any solution that automates human work Watson can elicit controversial responses. People open to change and have affinity for technology will embrace it, others will hesitate, and some will resist if it endangers their jobs. A successful implementation means that Watson is accepted and used by the end user. All SMEs will need to have a high level of trust in Watson in the same way as they rely on their own knowledge, experience and intuition. But what if they don't trust the quality of Watson's advice? What if Watson's advice is contradictory to their own experience or intuition? What happens when Watson makes a mistake; how forgiving will the SME be? Will they just ignore Watson?

SMEs might also think that Watson will replace them in the near future. Consider, for instance, when a banking employee gives financial advice to clients. He or she might be afraid that in the future Watson will be the one who gives the advice directly to the client. This fear might lead to counteract Watson by giving the wrong feedback.

If you want to make sure that your investment in Watson will pay off, you will need to increase the adoption rate to the highest level possible. The focus is therefore on change leadership and culture transformation in this stage.

- *One of the distinctive characteristics of organizations that successfully manage change is the significant role of the change leaders.* Driving successful change starts from the top and includes the entire organization—top management sponsorship, middle management empowerment and an overall corporate culture that promotes change at every level of the organization. There are clear new requirements for the leadership role—it needs to be expanded by including:
  - Accountability for change-leadership activities and results in the overarching business context
  - Responsibility for active engagement of employees, including the digital sphere
  - Ability to lead inclusively by empowering change-leadership at all levels

- *Changing the business culture is often considered the biggest challenge and determines the success of the project.* It is important to assess the current culture and to define the culture 'to be.' This will help to get insight in gaps and to plan for change in the culture, including:
  - Leadership to lead by example
  - Strong focus on TRUST during training and communication
  - Coaching on the job regarding new way of making decisions
  - Appraisal, reward and promotion procedures alignment, to provide the right incentives to use the solution properly
- *Have a stronger program in place to better manage the Watson implementation.* Transformation Strategy and Management facilitates the alignment of the organization towards program objectives and managing dependencies and conflicting interests across the organization.

### 4. Improve Watson

Watson learns from its interactions with the user. From the very first moment a cognitive solution goes live, the process of continuous improvement starts. All users contribute to the quality of the solution, passively or actively. Passively by using it properly. Actively by contributing with content or better couplings between questions and answers based on experienced lacunas or mismatches.

The input of the users can influence the quality of Watson both positive and negatively. Like many technological solutions, not using it properly can harm the quality and even the availability of the solution. Giving the wrong feedback will affect the quality of the answer Watson returns on a question if it's frequently done by the end user or groups of end users. Implementing quality controls is a method to monitor how the quality of the solution evolves. However, more important is to have the right incentives in place for the end users to use the solution properly and have the opportunity to suggest improvements.

*A company implemented Watson to improve the efficiency of their return merchandizing process because 73% of returned products were repairable and not irretrievably broken. Watson could support customers in solving the product issues remotely. The products that were returned could sometimes still be repaired. However for Watson to learn this new fix it needed to be taught by the repairers via a new script. Going forward Watson could also assist customers with this defect.*

Almost all Watson projects will have multiple SMEs involved to assure that the cognitive system is fed with the best information that is available in internal and/or external corporations at that time.

Another reason to involve multiple SMEs is to reduce the risk of bias, which is not uncommon for knowledge-driven projects.

During the final stage of the Watson implementation, change management activities are focused on:

- **Organization design and development:** Appoint committed data and content owners, revise roles and responsibilities and implement proven procedures. There should be feedback loops in place to make sure the right people will gather ideas, lessons learned, new insights from within and outside the organization and replace outdated content with new verified content. This process of continuous improvement needs to be managed carefully.
- **Value realization:** Assist the Watson team in identifying benefit owners and enrolling them in the program to develop and implement the plans necessary to realize and track value opportunities. This will lead to new areas to improve Watson.

## Change management roadmap for Watson

We can now place these change management focus areas into the context of the Watson engagement journey. In the graphic below, a change roadmap is presented highlighting the main activities in each phase along the lines of the Watson engagement journey.

### IBM's better change method

In order to achieve the full potential of Watson cognitive technology organizations must acknowledge that the implementation requires the organization to transform. This implies that the organization needs to transform across all dimensions of the organization (process, technology, data, people and organization). Research shows that organizational challenges, more than technology hurdles, are holding companies back reaching the potential benefits across the enterprise. Comprehensive Change Management delivers an answer to organizational challenges.



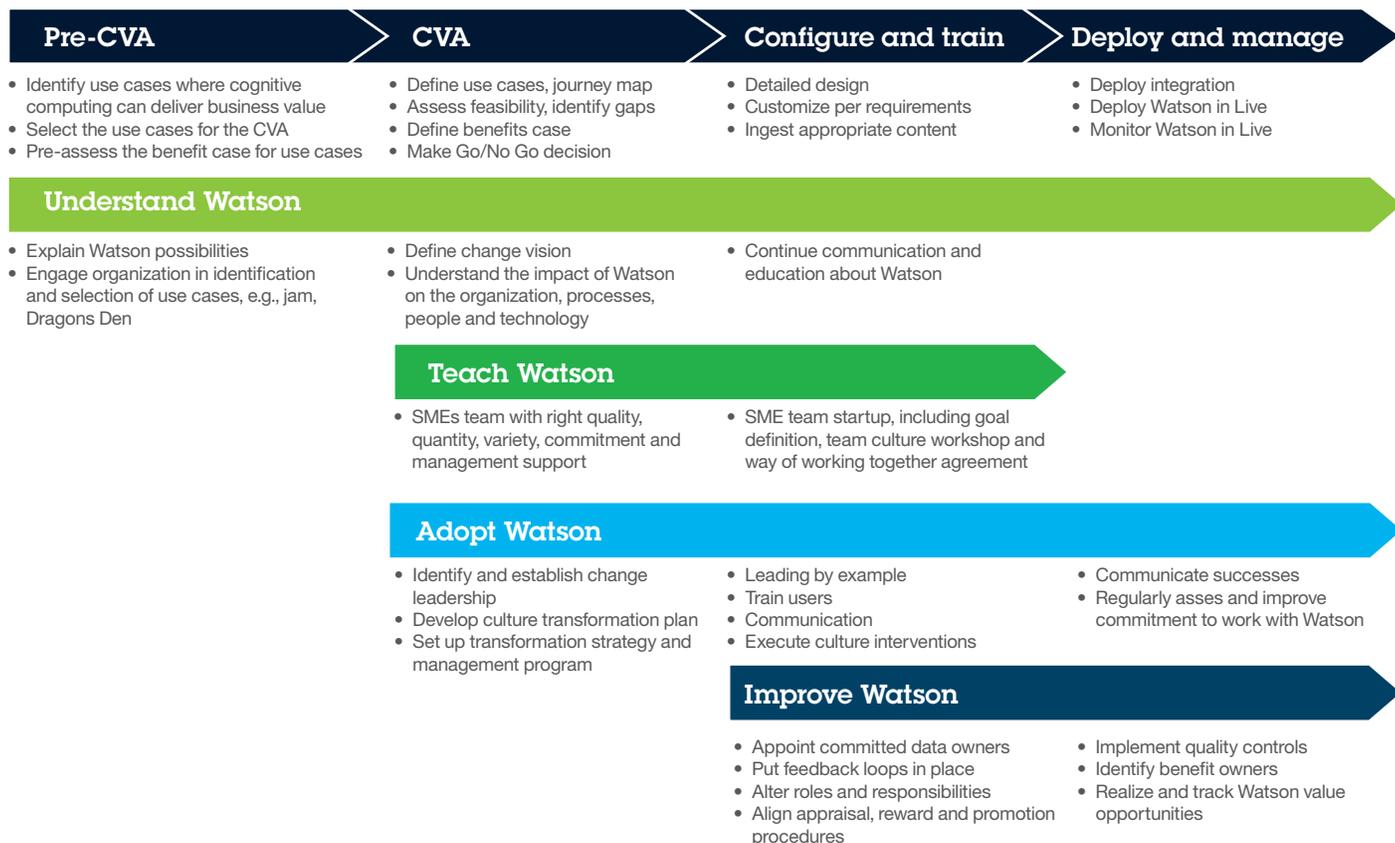
IBM's better change methodology provides a well-tested framework and step-by-step guidance to manage this. It is a systematic approach to change that is focused on outcomes and closely aligned with formal project management methodology. Six change enablers linked to value realization are comprised of topic-specific change modules to accelerate programs.

All enablers and value realization are applied throughout the Watson engagement. Activities in the areas of Transformation Strategy & Management, Change Leadership and Stakeholder Engagement are coming back in all four focus areas. Most of the modules in Skill & Knowledge are related to the Teach and Adopt focus areas. Culture Transformation is typical during the Adopt focus area and Organization Design and Value Realization during the Improve focus area.

### Conclusion

Watson is a pioneering technical solution that has a major influence on your organization. Therefore, it is key to engage your organization from the very start of your cognitive journey. To raise awareness and support for Watson implementations, IBM defined a change approach aligned with the Watson engagement approach. It will help project teams in the preparation and implementation of IBM Watson. The change approach for IBM Watson exists of four focus areas: Understand, Teach, Adopt and Improve Watson. This Watson change approach is based on the IBM better change method, which has helped hundreds of organizations worldwide managing the impacts of projects on their organization and people.

#### Watson engagement journey and high level change management focus areas



Change Management recommendations for Watson implementations:

- Start change management as soon as possible – Do not wait until you start implementing, but involve your organization in understanding, selecting and teaching Watson.
- Onboard your best people – Watson enables a unique partnership between people and technology. Involve and enable your best people because they determine the quality of your cognitive solution.
- Embed ongoing cognitive change in your organization – You are not finished after ending the first Watson implementation. The implemented solution needs to be improved continuously. Moreover, new cognitive solutions will be developed and implemented.

## For more information

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1 Based on IBM-internal data analysis.



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