

iSight for Innovation

Breakthrough collaboration for decision making

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A White Paper by

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Fifty years after the advent of decision support systems, despite twenty years of BI, enterprise decision making and innovation remain a hit-or-miss affair. This is because we have bought into a myth that great decisions and innovations spring from the mind of a lone genius. But if we examine innovative decisions in most organizations, particularly large enterprises, we see most breakthroughs coming from teams—not from some whiz kid.

This paper presents iSight, a model of collaborative decision-making and innovation. It presents a high-level architecture that maps to specific tools and methods required to create a systematic process within the enterprise that delivers real, implementable innovation.

iSight brings together formal and informal information, the worlds of Business Intelligence and Enterprise 2.0, in a framework that drives decision making. This model's strategic power comes not only from assisting in making today's decision well, but also by capturing the group interactions in each decision-making event so as to make useful recommendations for subsequent decisions.

The goal of this paper is to provide you with an understanding of this iSight model as a foundation for new thinking about how to support collaborative decision making, so you can better focus future investments in this vital area.

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Analyze. Socialize. Decide.

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Decision making—Back to the future¹

Business Guy: “I have not seen an innovative idea in a long time. Behind all of the fancy charts and presentations, there’s the same old status quo thinking. We have mobile data on our blackberries, and everyone is carrying iPads into meetings. But, something’s missing.”

IT Guy: “We’ve a data warehouse and dashboards. We’re starting big data and predictive analytics. The business has more data than they ever had. What’s the problem?!”

In the beginning, we had the field of Decision Support Systems (DSS): systems and process to help us make better decisions. Then, in the mid-1990’s, Gartner analyst Howard Dresner popularized the term **business intelligence** (BI) for the same field. Since being re-labeled, the BI industry has focused almost exclusively on the collection, analysis and presentation of formal, numerical, structured information for individual users. The assumption is that having provided enough “good, hard” information, IT can stand back and watch the business make better decisions.

There are two problems here. First, BI focuses almost exclusively on the delivery and use of rational, left-brain material: facts, data, analyses, etc. Second, BI has made the individual user the center of attention. This misses the reality that most significant decision making is a team effort. *Especially for decisions that require or produce innovation.* The truth is that innovative decision making often has little to do with the explicit, formal data on which we’ve focused most of our pragmatic thinking for over twenty years. It depends heavily on creative inspiration, emerging from the highly socially-oriented prefrontal cortex of the human brain². As a result, it seldom comes from a lone genius.

Our longtime focus on BI is blinding us to the obvious fact that the path from **information** to **innovation** is through the **interaction** of **individuals**. Sure, a few ideas occasionally pop up unbidden in the shower, but most of our best ideas—useful, productive, implementable ideas—arise out of interactions with our colleagues. We are social creatures, and the enterprise form of organization is predicated on the assumption that working together we are greater than the sum of our parts.

Business intelligence

*Individuals
Investigating
and creating
Information
to gain Insights
into reality*

All innovation is social innovation. Innovation does not happen ‘out there’ in the world of objects, but in society and in... the minds of the users, which are intrinsically integrated with [their] activities.³

That brings us to social networking and Web 2.0, which enables people on the Web to converse and collaborate with one another. Web 2.0 represents an evolving democratization of the Internet; not a statement about tools and technologies. Creativity has been open sourced. Content and applications are developed and distributed because people want to. Centralized control has given way to dispersed cooperation. Wikipedia, written and reviewed by the self-appointed masses, has displaced Encyclopedia Britannica, controlled and produced by anointed experts. Social media, from Twitter to Facebook, from Flickr to YouTube, has created an environment where people openly share their observations and opinions, and expose themselves to feedback. The Web has become innovative, cooperative, team-oriented.

Enterprise 2.0⁴ is the business flavor of Web 2.0, with the added structure and control required in the corporate world. It offers collaboration in real time with peers and superiors that can drive new thinking. And it presents new opportunities for the business to directly harvest and benefit from the wisdom and experience of “edge workers”—those who work intimately with customers and prospects, products and partners. Enterprise 2.0

Web / Enterprise 2.0

*Individuals
Interacting
and exchanging
Information,
generating Ideas
about reality*

shows the direction. But, on its own, it lacks the structure to drive collaboration to actual decisions. It lacks a model of the information required to inform those decisions.

What is required now is to combine the insights of BI and Enterprise 2.0 into a new model for innovative decision making within large enterprises, focusing on required technology and tooling to support a healthy collaborative process. That is the goal of this paper. The organizational change management aspects of this transformation are the subject of a second white paper.

Collaborative decision making today

Despite the situation summarized above, businesses rely heavily on teams of people to propose innovative solutions to most significant challenges. The team members may come from a single function in the organization or be cross-functional; a team may be newly created or have worked together before; it may be based in a single location or virtual. The challenge may be strategic or tactical, an opportunity or a threat. The team needs:

1. Individuals—with relevant expertise and motivation to participate
2. Interaction—complete and collaborative—between team members
3. Information—existing and built-to-suit—and a means to share it
4. Innovation—novel solutions whose impact can be measured

There are serious impediments to meeting these needs. First, we lack a system to integrate the people and their interactions in a holistic, decision-centric process that creates a user-driven, fluid, emergent, participative, and fact-based experience. So, it takes a lot of manual work just to make the process run. Innovation seems like very hard work.

Today's teams figure out on the fly how to work together. Communication happens through any available media. Meetings are arranged, poorly organized and loosely run. If an individual misses a meeting, there is no obvious way to re-address the conclusions reached or even to catch up on what has happened. Formal information (see sidebar) resources are gathered and stored on personal PCs, paper documents or wherever seems appropriate to individual team members. The web of interaction between the individual members is tattered and disorganized.

Second, irrespective of the decision—if any—taken, we lose a significant amount of important intellectual property—informal information—about it. The business context of the decision, including the team members involved goes unrecorded. The vast majority of the informal interactions among team members and with external parties, such as meeting contributions (face-to-face and electronic), phone calls, instant messages, Tweets, whiteboard

Types of information

Formal information consists of highly structured BI information from transaction systems, and variably structured, internal and external information such as documents and videos. It includes information generated in the BI environment, such as spreadsheets and presentations. Ideally, formal information is managed to ensure quality, reliability and availability, often in data warehouses or content stores, although some is poorly managed.

Informal information is generated implicitly as part of the decision-making process and includes phone calls, instant messages, conference recordings, annotations and more. This information is mostly lost today, because there is no single mechanism for collecting and managing it.

Formal and informal information are forms of explicit information that can be physically stored and managed.

Tacit information exists in users' minds rather than computer disks—at least for the foreseeable future. The existence of such information can be inferred and recorded only from the decision-making process and the behaviors of users. Tacit information is important in highly insightful decision making because it encapsulates the unique, specialized skills and experience of individuals.

drawings, etc. fall through the cracks forever. We lose the history of the thought processes that led to options considered or discarded, the engagement of team members, the timeline of events, the flows of information and ideas. In short, the record of how innovation happened is lost.

Finally, lacking a system to manage the process and a means to capture the above information, we are unable to close the loop between expectations set before and during the decision-making process and what actually happened in the real world when the decision was put into action. In truth, the level of innovation cannot be determined with any certainty.

These problems beg for a mechanism to organize, direct, and document the team’s collaboration—the entire process, not simply the outcome.

iSight for innovation

We have seen more change in the last ten years than in the previous 90.⁵

If we are to understand the requirements for a collaborative decision management platform to encompass the entire process, we need a model for how teams make decisions. There are two distinct pathways involved: one happens as individuals work alone—**investigation**, the other when they work together—**interaction**. As we’ve seen, BI is an example of the former; Web 2.0 of the latter.

Investigation

Investigation begins with a challenge, followed by the gathering of formal information in the shape of documents and databases, as shown in figure 1. The individual gathers and integrates it. He works on it. And he generates further formal information, such as spreadsheets and presentations, at the end. Intention⁶ determines what information is gathered, the path followed and results produced. At the core of the investigation pathway are three processes:

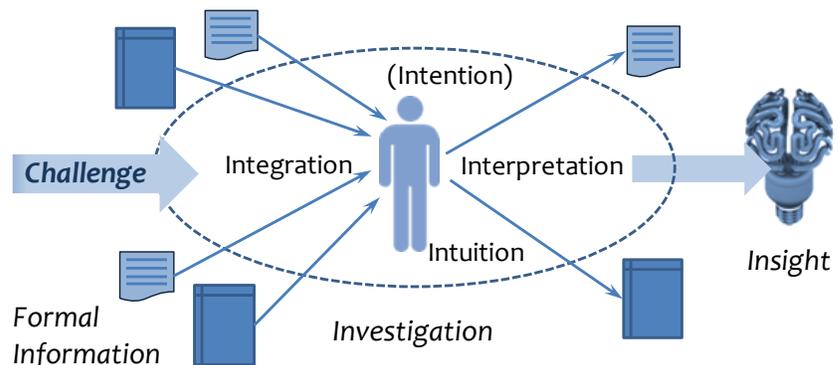


Figure 1:
The Investigation Pathway

1. **Integration:** Information overload is the rule today, so integration of information from the business and beyond is a key process. The individual’s knowledge of the sources of information and the relationships between them guide her towards meaningful and relevant facts.
2. **Interpretation:** As information is integrated, statistical models, visualizations and other tools can be used to interpret it. Furthermore, each individual assigns meaning to formal information from the environment based upon her unique experience and expertise—tacit Information. Interpretation is the logical development phase of investigation.
3. **Intuition:** Because change is the genesis of opportunity for innovation, deduction alone cannot carry the individual across the chasm from the status quo. A leap of “maybe if” is required. Hunches emerge from the intersection of individual tacit and explicit information.

The outcome of investigation is insight—an answer to the challenge posed, usually in the form of a document or presentation. This insight is based solely on the formal and tacit information available to the individual doing the investigation. As we saw previously, this is the model of traditional BI.

Investigation does not, of course, occur solely in a personal isolation bubble. There are multiple points of interaction with colleagues. However, the processes described here are best performed in large part alone. Developing a new spreadsheet, preparing a presentation, documenting a position are best done in isolation until something explicit has emerged. Recall the phrase “a camel is a horse designed by a committee” and now let’s look at interaction.

Interaction

We’ve reached the nub of innovation. We humans are largely social animals. And business is a highly social affair. Decision making in business is largely a collective process, whether openly in more democratic approaches or hidden beneath autocratic ones. Interaction with colleagues and competitors, customers and contacts, is both the lifeblood of the business and the well-spring of innovation.

An individual working alone can create well-structured and elegant *formal* information. However, the sparks of inspiration often fly when two or more individuals gather in the name of interaction. Individual intuition and interpretation are heightened and enhanced through social interaction. Social networking refines our interpretations, expands our intuition, tests our intentions. From a few words at the water cooler to a brainstorming session, individuals walk away with new ideas to apply to existing challenges. The ability to engage colleagues in clarification conversation adds significant power to interpretation. Intuition is sparked by diagramming, manipulation, and verbalization—particularly in live discussions with colleagues. At the heart of the interaction pathway is *informal* information, and three processes that link to it:

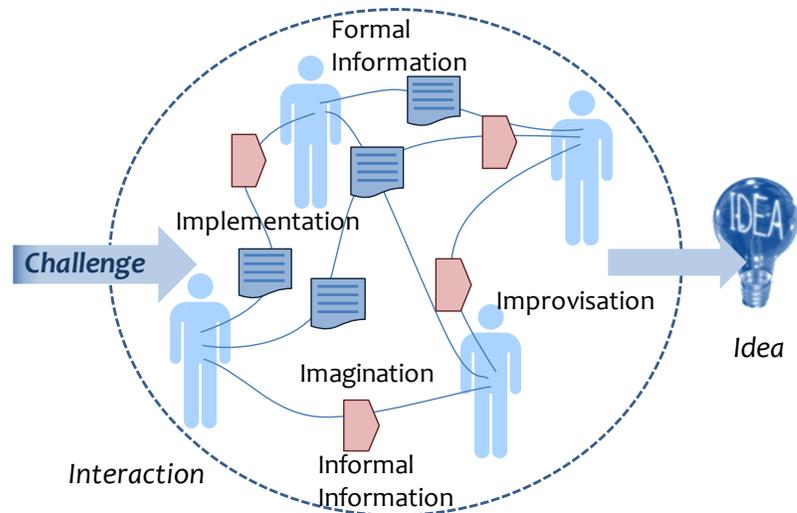


Figure 2:
The
Interaction
Pathway

- 4. Implementation:** How do you create a collaborative team? How are people added and removed? How are meetings arranged and documents shared? Implementation covers the drudgery we forget when we’re asked to create a team to solve some problem... until we’re struggling to gather phone numbers and e-mail addresses, book meeting rooms and so on. Without the mundane activities of implementation, the magic of imagination and improvisation never materialize.
- 5. Imagination:** Imagination is the team-level counterpart of personal intuition, and it is at the core of innovation. Within imagination, my tacit information is stimulated by the tacit and explicit information of my colleagues and *vice versa*. And I walk away with added formal information, too.

For example, consider two team members collaborating to diagram a potential solution on a whiteboard. Sam is adding elements to the diagram while contemplating the elements Lisa is adding at the same time; and Lisa is doing the same. Each person is interpreting the input of the other, filling in gaps in the other person’s information or expertise, and being stimulated to risk

offering half-baked ideas for bridging key problems—which the partner can test, refine, extend, or reject. They may even be in different rooms, or countries. Powerful.

6. Improvisation: While the drive in imagining is to expand the set of possible ideas and solutions, improvisation applies constraints—such as budget, current physical and staffing limitations, competition, etc. The discipline of improvisation balances the creative energy of imagination. Imagining and improvisation are interdependent.

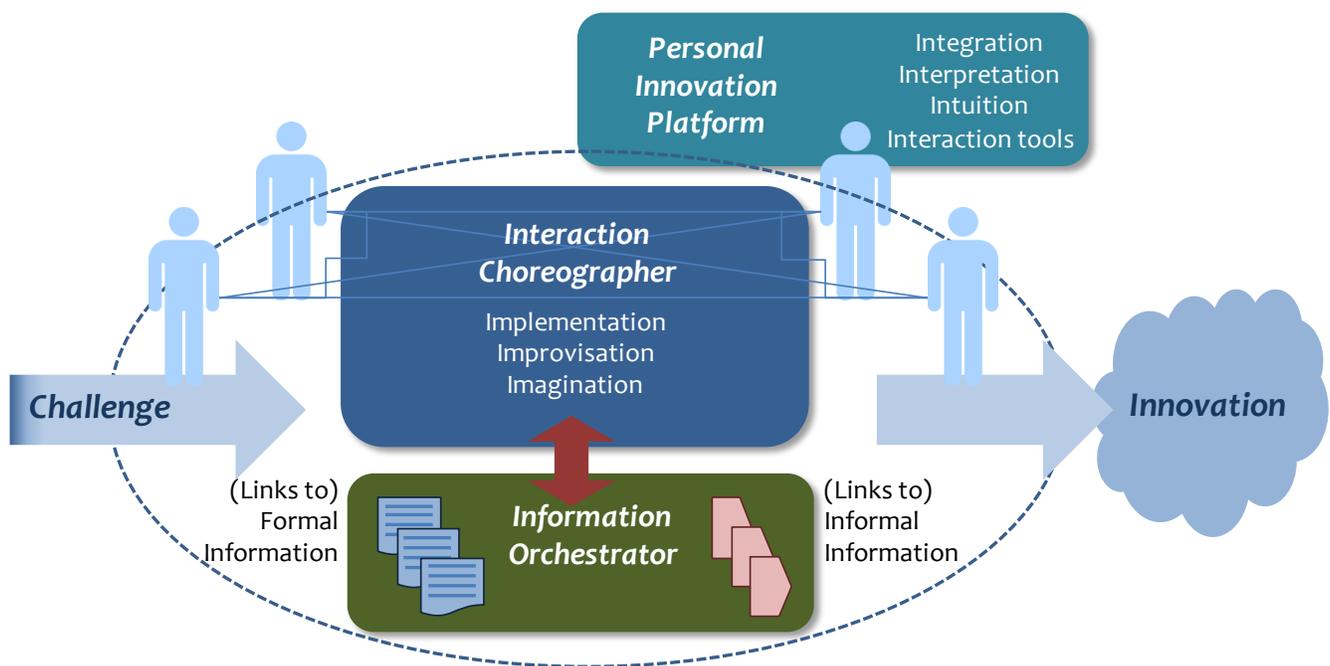
Note that documents and other formal information resources are being shared. Interaction clearly involves formal information as well as the informal variety. We focus more on the informal information here, because it’s falling through the cracks today. Formal information could be better managed too. And they need to be managed together, because they’re interrelated.

Furthermore, individuals interacting in a team bring with them their individual investigation processes. Participant contribute formal information such as documents and databases to the team and some are responsible for creating formal information such as position papers and presentations at the end. The output of the interaction pathway are ideas—possibly incomplete, certainly partially formed, the result of people causing one another to change their thinking and come up with something new.

A team has no central brain. All processing happens on a distributed basis, so to speak, in individuals’ heads. It’s a network. Like any other networked model, the more information and the more types of information—formal, informal and tacit—that can be brought together, the better are the odds of getting a reaction like: “Bob said something yesterday that got me thinking about the chart that Sam showed us in the meeting last week. If I could just find some data on XYZ, I think I could modify Sam’s chart to see what’s really going on and see a possible solution.” A combination of insight and ideas. *Eureka!* Innovation.

What we need to do is to join the two pathways together to create an overall collaborative decision process. Let’s do it!

Figure 3:
The iSight collaborative decision platform



A collaborative decision platform

The pathways and processes described above exist today. Unfortunately, they're largely unnoticed. Significant parts of them are implemented only manually. Some even have basic software support. In this section, we define an architectural platform to integrate and enhance the investigation and interaction pathways. Figure 3 illustrates the iSight collaborative decision platform for innovative team decision making, showing three high-level groupings of the most important functions needed.

Interaction Choreographer

The interaction choreographer (IC) set of function is the heart of the iSight platform and coordinates and tracks all digitally-enabled interactions that occur between the individual members of the team. Its role begins with the initial creation of the team, gathering profile information about the team members. If individuals have been involved in previous team efforts, relevant contribution information may also be included. As the team evolves, changes in team membership are also recorded.

The main role of the IC is to keep a record of all digital interactions of the team members. This is a background function that requires no additional work for team members. Its value-add for the team is the ability to easily find and use the history of the team's work. Who knows about this topic? Who proposed that? Why did we choose that option over the other? What happened in that meeting that I was unable to attend? The IC does *not* define or direct the flow of the decision-making process; rather it records it, creating the links between individuals and their interactions, between individuals and information and between information and interactions. This record persists after the team has disbanded, allowing reuse of the process flow and information resources in future, similar projects and supporting evaluation of individuals contributions to the decision process and deliverables.

The IC depends on the information orchestrator for all links to stored information.

Interaction choreographer: key collaboration features

- Integrating many communication channel options (IM, phone, video, email, update, comment/reply, etc)
- Cross-referencing communication content from all channels with related information artifacts and decisions
- Identifying and suggesting relevant related information in other conversations or artifacts
- Tracking popularity, attitudes, re-use, linking, and derivations/modifications of the original content in the original signal
- Tracking and documenting the people, behaviors and information used in a decision
- Tracking and scoring user influence and expertise topically
- Understanding and aligning to the formal organizational charts/responsibilities
- Documenting and tracking commitments, KPIs (key performance indicators)
- Monitoring to-do's, assignments, and status reporting
- Short-cycle escalation, socialization, and resolution of issues
- Sign-off process management, including documentation of caveats and conditions

Information Orchestrator

The information orchestrator (IO) is simply a distributed content management system and store. As we've already seen, the vast majority of the formal information used in decision making already exists and is thus stored in existing databases and content stores. The IO provides virtualized access to these stores. Formal information is also created during decision making, but is often stored locally and poorly managed. For such information, the IO may provide a shared content store, virtualized access or a combination of both.

Informal information, on the other hand, is largely unrecorded or discarded after use. The role of the IO is vital here in providing permanent storage for such information.

Information orchestrator: key collaboration features

- Storing whiteboard drawings and ensuing conversation for future reference and reuse
- Storing audio content of meetings, web meetings, calls and voicemail; Audio-to-text translation
- Storing video content of meetings, web meetings, including screen sharing and diagramming
- Storing margin annotations or drawing layers over formal online documents
- Linking to existing databases and content stores of information (formal and informal)

Personal Innovation Platform

The personal innovation platform (PIP) is the individual user's interface to the working environment of the team. Its goal is to be invisible to the users, seamlessly extending their use of existing collaboration and BI tools. So, rather than being a brand new user interface, it is a virtualized mashup of the existing tool interfaces used by the individual in their day-to-day work.

Personal innovation platform: key collaboration features

- Integrated instant messaging Q&A for immediate clarifications from colleagues
- Interactive visualization of data and processes
- Drawing and whiteboarding, both private and collaborative, recorded in layers by participant
- Ability for users to synthesize data from any source easily, impulsively
- Interactive sampling, remixing, derivation from all shared artifact types
- Integrated search engine for all formal and informal knowledge
- Upload, share, link, embed any artifact, data, widget or feed from any source
- Ease-of-use and feature-experience attractive to all personnel
- Creating a perception of proximity for remote participants
- Near real-time feedback and co-editing online documents, presentations, diagrams, spreadsheets, charts, dashboards, etc., including margin annotations or drawing layers over formal online documents
- Right-brained visualizations such as mind-mapping, visualization, modeling, geospatial mapping, etc.
- Easy consensus building tools, including polling and alternative-rating

Getting started: Collaboration, Content, and BI

From the preceding sections, it should be clear that the focus of the iSight model is threefold. First, deep and extensive interaction in a well-managed team environment is key to innovative decision making. Second, the storage and management of informal information generated during such interaction provides a platform for in-depth decision-making support. Third, potentially automated analysis and interpretation of such informal information lays the path from previous experience to future reuse and the creation of tacit knowledge. We can map these three focus areas directly to current software domains:

- 1. Interaction:** Web / Enterprise 2.0 tools and techniques emphasize social interaction between peers and the networks that may form and can be encouraged in this environment. The emphasis often is more on the sharing *per se* rather than on the use to which the information is put. Collaborative software extends the approach to achieve specific goals. With appropriate focus and extension, these tools can become the core of iSight interaction.
- 2. Informal information:** Content management systems store highly unstructured information. Applying these tools and techniques to the informal information that underlies decision making is vital for iSight.
- 3. Interpretation:** Business intelligence tooling has traditionally been applied to the formal, especially numerical, information of the business. Extension of the scope of such tools to informal information and a greater emphasis on text analysis can provide the basis for a more automated and reasoned approach to the process of decision making.

For the BI community, a word of warning is in order. The majority of BI tools have recently been implementing “collaborative BI”. This is quite a different and substantially more limited concept than what we discuss here; it is unlikely to be a starting point for iSight. Collaborative BI starts from a model of BI where individuals do analysis and then want to share it with others and work the analysis over with peers and managers. The focus is largely (and often entirely) on the results of BI analysis of formal, numerical information. The collaboration and content management described in points 1 and 2 above start from an entirely different set of information and with a very different goal: supporting the process of decision making rather than the individual decisions themselves. Furthermore, as we examine the full scope of information used in decision making, we can clearly see that the remit of the BI team in most organizations is far too narrow to cover everything we need.

The bottom line is that the iSight model must start with collaboration and the tools to support it broadly in the organization. This will require a rather different focus than traditional BI, although the skills and knowledge of the BI team around decision making will need to be applied. As electronically-assisted collaboration becomes the norm in the organization, the concept of storing and using the informal information that supports that collaboration can be introduced—with due regard for privacy concerns and issues of control and transparency. Finally, BI tools can be applied to the stored content of the decision-making process in order to derive the full benefit of the iSight model.

Conclusions

“Our traditional teams are too slow. We’re not prototyping fast enough, not innovating fast enough. We need to systematize change.”⁷

We stand today at a tipping point in our understanding and implementation of decision making in business. Until very recently, our entire focus has been on business intelligence, focused on largely internally-generated, numerical information analyzed and interpreted by business users of various skills level. Recent trends in information availability and usage, in the extent of innovation required have led to an existential crisis for BI. Added to this, the arrival of social networking approaches has led forward-looking organizations to question if there is a better way to support decision making.

Team-based decision making is central to reaching innovative solutions to a wide variety of problems. The increasingly pervasive use of digital communication and information storage has now enabled new thinking about this process, leading to the iSight model presented here. The key message is that innovation emerging from the interactions of the individuals in teams can be enabled and supported by storing, managing and using the informal information generated in the decision context that is currently lost.

We have the technology to record much or all this informal information, subject to the personal and organizational concerns and consequences of storing and using it. The iSight model shows how to use it to enhance the decision-making process in a variety of ways, leading to an entirely new decision-making environment that supports all types of decisions—operational, tactical and strategic—that require innovative, team-based thinking. The iSight platform enables team-based decision making to be understood, designed into software solutions and implemented in innovative organizations.

Dr. Barry Devlin is among the foremost authorities on business insight and one of the founders of data warehousing, having published the first architectural paper on the topic in 1988. With over 30 years of IT experience, including 20 years with IBM as a Distinguished Engineer, he is a widely respected analyst, consultant, lecturer and author of the seminal book, “Data Warehouse—from Architecture to Implementation” and numerous White Papers.



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¹ “Back to the Future” is a 1985 science-fiction film, directed by R. Zemeckis and produced by S. Spielberg

² Siegel, D., “Mindsight”, Oneworld Publications, (2010)

³ Tuomi, I., “Networks of Innovation: Change and Meaning in the Age of the Internet”, Oxford University Press, (2002)

⁴ McAfee, A., “Enterprise 2.0: New Collaborative Tools for your Organization’s Toughest Challenges”, Harvard Business Press, (2009)

⁵ Ad J. Scheepbouwer, CEO, KPN Telecom, IBM Global CEO Study, (2008)

⁶ Intentions can be “good” or “bad”, personally motivated or aligned with the organization. As a topic, this is beyond the remit of this paper. However, we postulate that it may be possible to infer an individual’s intention from a record of his behaviors and interactions within a team. This could be a future aspect of the iSight model.

⁷ Beth Comstock, Chief Marketing Officer, GE, <http://www.fastcompany.com/magazine/162/generation-flux-future-of-business>