## Research Information Management at Synaptic

All names, locations and sensitive figures have been changed to maintain client confidentiality

### COMPANY BACKGROUND

Synaptic is a San Diego biotechnology company that develops drugs based on proteins and peptides. Synaptic currently has one product approved by the FDA, and two additional drugs undergoing clinical trials. There are about 1200 employees at the company. Of these, about half are located in San Diego, and another half are employed in field sales and in remote manufacturing facilities. Synaptic has a large information technology department, that the company calls "Information Management" (IM). Headed by Chief Information Officer (CIO) the IM department employs about 100 people and is charged with support of all communication and computer systems used in company operations. IM is organized in three divisions according to the function of the client organization: Research IM, Manufacturing IM and Infrastructure IM. Each division is headed by a Director. The three IM Directors report to the CIO.

In addition to the IM professionals, Synaptic employs a number of "computational scientists" who conduct biology research using mathematical models on a computer. These scientists are not members of the IM department, but instead report to the Director of Computational Biology, who, in turn, reports to the Chief Scientific Officer (CSO). Majority of these computational scientists, and Director herself, hold advanced degrees, and are quite proficient in computer programming. Just like the IM professionals, many of the computational scientists have been with Synaptic for years. Many maintain close personal friendships with their colleagues. Some even circled back to the company after attempts to pursue other job opportunities.

### SITUATION AND INTERACTIONS

Because of the nature of their research, computational scientists frequently interact with the IM personnel, and there is some overlap in responsibilities. Traditionally, computational research projects are initiated in the Computational Biology group. Due to the nature of research work, many of these projects are quickly abandoned. But those projects that do go on eventually require support from the IM. The support may mean custom development, allocation of space on servers and databases, program execution and monitoring with periodic reports to the scientists, data updates and uploads, etc.

### CULTURAL CHALLENGES

However, the cultures of the Computational Biology and IM groups are quite different. Scientists value innovation, originality, and speed. Many of them prefer to work in solitude, and this practice, despite all politically correct references to the importance of teamwork, is not frowned upon in the company. On the other hand, computer professionals in the IM are concerned with stability, business continuity, documentation, and long-term planning. Also, IM has a very strong preference to make decisions in meetings. The cultural difference between the two departments may be traced back to the typical career tracks of scientists and computer professionals. Scientists would

normally go through multiple years of academic experience prior to joining Synaptic, and some senior scientific managers, including the CSO, held tenured positions in the past. IM workers would typically leave academia upon graduation and spend the bulk of their careers in industry.

The cultural difference between the groups causes frustration on both sides. IM managers are complaining that scientific software development is done ad-hoc and it follows no standards. To quote one of the IM directors, "They throw something together, then come to us and demand that we support it. Yet there is no documentation for it. And worse, even in many cases they do not consult us beforehand, only to discover later that it [the new project] is not compatible with the company IT architecture. How would you like to be asked to switch to a new line of servers, on an extremely tight deadline, without advance planning and without budget to buy any? How would you like to have your job dependent on it? You'd be damned if you do and you'd be damned if you don't. And then they turn on a dime, and ask you to drop everything and do something else." Computational biologists, on the other hand, are equally unhappy with the IM's slow development pace and demands for documentation and governance that scientists perceive as bureaucratic and wasteful. "You can't get them to do anything. I need Oracle 10g to run my sequence database. The rest of the world has had it for years! Yet the IM tells me that they are on version 9, and it is the company standard and they won't upgrade. We call ourselves a high technology business, yet we are five years behind the technology curve."

## PREVIOUS "SOLUTION" AND AFTERMATH
In the past IM management attempted to reconcile this conflict by creating a formal business process to "transition projects from research into production". This effort was ultimately abandoned since scientists refused to follow the standard procedure, preferring informal communication instead.

As a result of these frustrations, some of the computational scientists lost faith in the IM and started to create their own information technology systems. In the most prominent example, one scientist, Steve Levitt, M.S., hosts his programs on a high-end PC located in his office. He has his own Oracle database on that PC (and yes, it is the latest version of Oracle). He manages the data upload and back-up procedures on his own. Everything he has ever worked on is on that computer. The information stored on his PC includes, among other items, software and data for one of the key computational biology business processes. His work is known to a few of his colleagues in the company, but not in sufficient detail to reliably operate his software. So when Steve goes on vacation, he leaves his cell number behind to call in case something breaks. Realizing how important Mr. Levitt's work is for the company, Research IM manager repeatedly asked Steve to document his computational process, and to submit it for the "transition into production" process. Steve repeatedly took no action on these requests, and attempts to influence his manager had no effect.

Other scientists follow some of the same practices in their daily work, although to a lesser degree. And some other scientists are reaching out to third-party consultants instead of the Synaptic's own IM. The owners of Fast, Inc., a small consulting company that Synaptic retained were available for an interview. "We are former PhD research scientists ourselves, and so we know very well what scientists need. We operate lightning fast, and on most projects, we turn around so quickly, that they don't even know what hit them." When asked about an apparent difficulty of selling science to scientists, the consultant replied, "We do all selling really on the C-level, relying on our local network of contacts." The consulting company owner acknowledged that speed of development comes at a cost of cutting corners when it comes to documentation. "But, we maintain our own computational infrastructure in our own office, and we keep the data and software that pertain to our work with Synaptic right here, and we know it all intimately. And eventually, these ad-hoc projects develop into products, and when they do, we document them well. What's more, because of our favorable agreement with Synaptic, we retain all rights to the software, and we are able to offer it [software initially developed at Synaptic's request] to our other clients." Over the years, the relationship between Synaptic and Fast became quite close. Fast's owners attend some of the research meetings at Synaptic, and they have persuaded Synaptic's top management to buy a share in Fast. The consultants mentioned their plan to eventually sell Fast, Inc. completely, and to move on to other business interests.

Research IM management is very concerned with the widening disconnect between the IM and their clients in the Computational Biology group. It is thought that the Computational Biology department businesses practices, so focused on individual technical prowess and on tacit tribal knowledge, may eventually lead Synaptic to a technological disaster.

### CRISIS
The first harbinger of possible future problems hit on Christmas Eve of 2006. A large number of errors were found in Synaptic's main database, and upon a two-month-long investigation, the errors were traced to Steve Levitt's calculations. It appeared that some parameters in Steve's process were changed as part of an experiment in the early days of 2006, but then both he and his supervisor forgot about it and failed to switch them back. The process operated with a wrong parameter set for nearly a year, invalidating much of the data accumulated in 2006. Research IM Director was asked to correct the problem, but without understanding of Steve's research and direct access to his software, the task proved extremely difficult. Ultimately, the CSO demanded that the Research IM Director be relieved of his duties. The IM Director left the company, and Synaptic promptly started a recruiting campaign to back fill his role. Chief Scientific Officer assumed his responsibilities in the interim. Steve and his supervisor were not reprimanded.

The Chief Scientific Officer was available for a very short interview. When asked about his assessment of the database problem, he started by stating, "Ultimately, we all are to

blame for this." The conversation then turned to the failure of IM leadership and to the incompetence of the fired Director. "He should not have been made a Director in the first place. He was a manager, nothing more, and a poor one at that."

The Chief Information Officer declined to be interviewed.

To address the snowballing problems, the IM senior management decided to create an additional position. The new job would serve as a middleman between the IM and the scientific group. It would require a doctorate degree in the biological sciences (to earn respect from the Computational Biology workers) along with multiple years of IT experience. However, the new role would not be a senior management position. After their efforts to locate an individual with suitable qualifications failed, the Synaptic IM management has contacted you, a consultant in independent practice.

## **YOU, THE CONSULTANT**
You have just visited Synaptic where you've met individuals described above. You can reasonably expect to be offered a job as a consultant by Synaptic. You have been told that your ultimate job is to address their organizational problem by proposing a strategy to improve cooperation between the IM and the Computational Biology. From the practical standpoint, it is not likely that you would have an authority to hire and fire top managers, or to perform mergers and acquisitions, so proposals involving any of these are not likely to be accepted by the client organization. You need to first address the Risks facing the Information Management process.

APPENDIX 1. Partial organizational chart of Synaptic
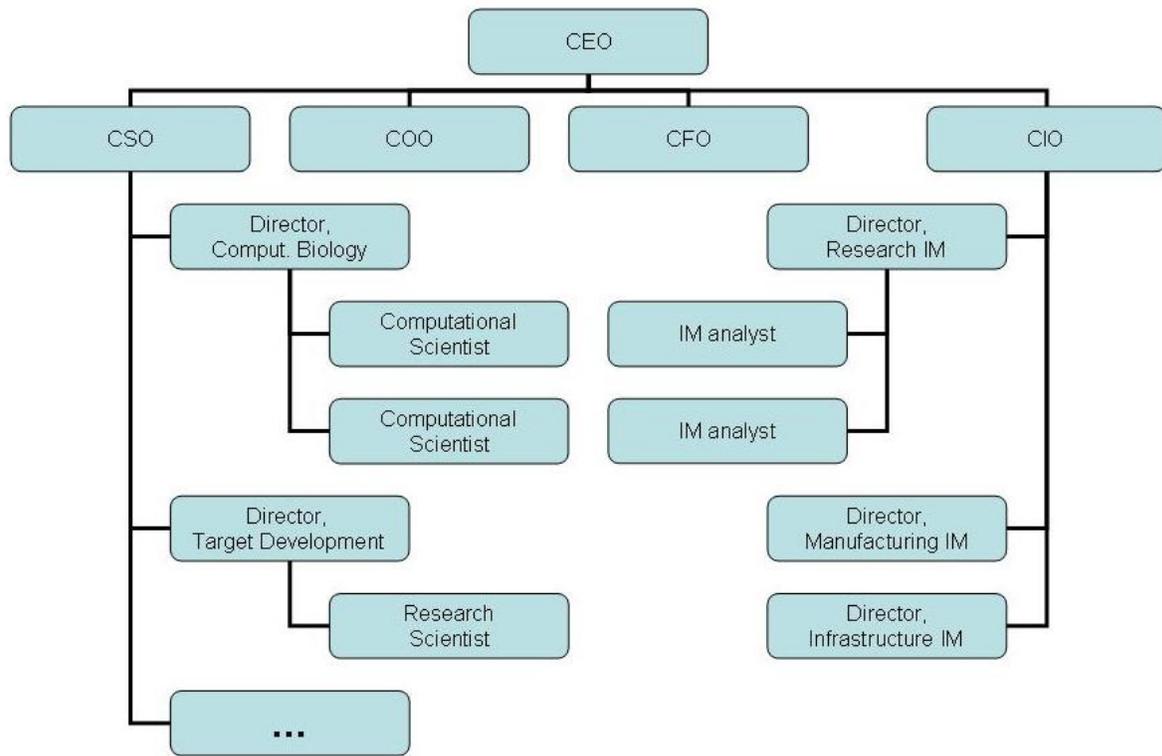
## APPENDIX 2. Information Management governance business process

IM prefers to have a formal business process for evaluation and prioritization of new IM projects. It is called governance. The claimed benefits of governance are:
- a better alignment between the IM project portfolio and the needs of the business and
- a more productive allocation of IM resources

Governance business process requires an IM business analyst to collect the user requirements and create a business case for every new project, clearly outlining cost and benefits of the proposed work. An IM Governance Committee, meeting weekly, would then evaluate the portfolio of business cases for each week, and assign work resources to them. Note that there is a chance that a business case may be delayed due to resource availability, or not approved at all.