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MediSys Corp.: The IntensCare Product Development Team

It was just six months away from MediSys's planned August 2009 launch of IntensCare, their new remote monitoring system for use in hospitals' intensive care units. The company was investing $20.5 million in the new system, which represented the most ambitious project in the company's 10-year history.

Valerie Merz, marketing manager for IntensCare, was feeling enormous pressure as she reviewed the agenda for the upcoming meeting of the product development team. Once again there was no scheduled time to resolve the debate over the modular design that she knew was critical to successful adoption and long-term success in the market. Without this modularity, she was certain that the system would lose market share to the competition's forthcoming products, both scheduled for release within the year. And it wasn't just her P&L that would take the hit; the team, and the whole company, would look second-rate.

"Why isn't Jack stepping up on this issue and getting it resolved?" Merz wondered. Jack Fogel, senior production manager, was the project lead for IntensCare, but in Merz's opinion, he was far too focused on the details of the product side and far too little concerned about the business issues and the impending launch. Perhaps it was time for her to blow the whistle and get the bosses involved. How else could she get her colleagues to do the right thing for the company and not just for their own departments?

Babson College Professor Anne Donnellon and HBS Professor Joshua Margolis prepared this case solely as a basis for class discussion and not as an endorsement, a source of primary data, or an illustration of effective or ineffective management. This case, though based on real events, is fictionalized, and any resemblance to actual persons or entities is coincidental. There are occasional references to actual companies in the narration.

MediSys: Background and Organization

MediSys Corp., a privately held U.S.-based medical device manufacturer, was founded in 2002. Its annual revenues in 2008 were $400 million, and the company employed 1,750 people.[1] The company developed, manufactured, and sold medical monitoring systems for the hospital segment. MediSys's first two products were highly successful specialty pulmonary and renal monitoring systems. Though still relatively small, the company was very profitable. Its entrepreneurial culture had fostered innovative thinking across the company, and as a result, numerous promising initiatives were at various stages of development—from redesign to development of new systems.

However, the board of MediSys saw early signs that growth was slowing. Two well-known public competitors, with deep pockets and strong reputations in the industry, had announced they were moving into MediSys's key markets with products designed to compete with IntensCare. A similar competitive response seemed likely as MediSys launched future products as well.

Partly to counter this threat, an aggressive new president, Art Beaumont, was hired in January 2008 to sharpen strategic focus while preserving the innovative culture and restimulating rapid growth. Within weeks, Beaumont introduced a series of changes. As shown in the MediSys organization chart (see **Exhibit 1**), the company continued to be organized functionally; however, Beaumont created an Executive Committee consisting of his five direct reports: the vice presidents of sales and marketing, research & development, design and engineering, production, and administration. His intention was to develop them into an executive team that would jointly create and implement a strategy for growing the business swiftly. His early months in the job convinced him that, despite the entrepreneurial culture, some of these managers had become entrenched in their functional roles and that progress could take some time. While he worked on shaping his management team, Beaumont also formalized a process for product development. He believed that MediSys could outmaneuver its larger, richer competitors by speeding product development through the use of cross-functional teams. Speed was the key. [2]

New Product Development at MediSys

Historically, MediSys's approach to product development was essentially sequential:

1. Research & Development (R&D) staff typically started the development sequence by proposing new technologies or new systems that could yield significant new business opportunities.

2. Once the leadership agreed on a new idea, Marketing developed product descriptions from customer needs and responses to new MediSys concepts, and then passed these on to Product Engineering and Software Design.

3. Engineering and Software Design developed them into product specifications, and passed those on to the Regulatory group who researched and, where necessary, conducted clinical trials to test prototypes of the systems.

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[1] In 2008, the average value of annual shipments per paid employee in the medical equipment industry was approximately $190,000.

[2] A widely cited economic model developed by McKinsey & Co. calculates that going 50% over budget during development to get a product out on time reduces profits by only 4%, but staying on budget and getting to market six months late reduces profits by a third.

4. Once these specifications were finalized, they were passed on to the production group, which arranged for the fabrication and assembly of the products.

In August 2008, Beaumont introduced a new parallel system for product development in which a "core team" of people assembled from all the critical functions—R&D, Marketing & Sales, Product Engineering, Software Design, Regulatory, and Production—worked together continuously to move a product from conceptual stage to final production. For every core team, a project leader was designated to orchestrate its work, keep an eye on the complete project, secure resources for the team, and serve as a liaison to senior management. Beaumont believed that the project leader needed to have cross-functional expertise, a track record of high performance, and the respect of his or her colleagues.

Most of MediSys's professional employees embraced the cross-functional team design and parallel development process. Conceptually, it fit their entrepreneurial and team-like approach, though it was more disciplined and formal than they were used to. They understood that parallel development required new ways of thinking and behaving, particularly in relationship to the functional areas that had grown up with the company. "Parallel development doesn't allow people to single-mindedly defend the position of their functional area," one employee noted, "or what's easiest or best or cheapest for their own functional area. It forces people to look at the bigger picture."

While requiring that functions look at the "bigger picture," parallel development did *not* alter the way reporting and evaluation occurred. All employees, including core team members, continued reporting to their functional managers who continued to supervise and evaluate them.

Art Beaumont recognized that the management style of all the MediSys executives would also have to change in a parallel development environment:

> I know I am asking these folks to give up control, which will be hard for them in the context of this major investment. But as the company has grown, a management style has evolved here that doesn't reflect the entrepreneurial spirit that everyone loves to brag about. It has become much more of a command-and-control culture with an emphasis on technical excellence. Not that we don't need that, but the competition has become intense and our reputation is on the line, so we need all the brain power and discretionary effort we can get. I think that cross-functional teams are the only way to get that. But it will be challenging for my direct reports and me to change our styles to be more patient, open, and trusting, and not to intervene.

History of the IntensCare Project

IntensCare had developed in typical MediSys fashion (see **Exhibit 2** for a time line of this product development effort). In September 2006, Aaron Gerson from the R&D group had the idea for a patient monitoring system that would collect data on patients in intensive care units and post it to an electronic database that could provide an integrated profile of an individual patient's health and would also send email messages to various physicians and nurses involved in the patient's care. He pitched this concept to Peter Fisher, a friend in Sales, who tested it with clients and found great interest. The two invited a third friend from Software Design (who later left the company) to chat with them about how this might work, and before long an ad hoc product development group had organized itself informally to develop this opportunity.

Over the next year, this ad hoc group developed preliminary market research and product designs, which they took to the senior leaders of MediSys to request funding for further product development. In July 2007, the group was given $500,000 to be used for software development and ongoing product engineering work. Progress was slow, as the team members were often pulled away to work on other priorities in their functional areas. Fisher had been promoted to vice-president of Sales and Marketing, but started working immediately to identify an external hire to replace himself in this effort.

In August 2008, Beaumont formalized a core team and chartered it to accelerate the new monitoring system. (See **Exhibit 3** for his notes on a list of team members and their backgrounds that Beaumont had obtained from Human Resources as he was planning the changes in the IntensCare project.) The team members included two people from the original ad hoc group: Aaron Gerson, the R&D researcher who formulated the idea, and Bret O'Brien, a manager in product engineering. Jack Fogel, senior production manager, was named project leader based on his extensive production experience at MediSys and his track record for successfully managing the interface between engineering and production. Dipesh Mukerjee was assigned to oversee the software design and development (and had made it known immediately that he intended to outsource both functions to a firm in India). Karen Baio was asked to represent Regulatory Affairs, and a new external hire in Marketing—Valerie Merz—was assigned to oversee the product launch and manage the P&L for the new product. Managing this as a business was Merz's sole assignment for the next three years.

Beaumont approached the IntensCare project with a sense of urgency: "Two competitors have announced that they will launch similar monitoring systems within the year. We have to get this product out the door on time and we cannot make a mistake." Beaumont committed an additional $20 million to the rapid development of IntensCare and communicated the new IntensCare goal: "Launch an innovative, world-class MediSys product by August 2009."

The IntensCare Team

Before the IntensCare team was formally chartered by Beaumont, the group was convened by Aaron Gerson and typically met every other Friday afternoon for an hour or so. When Jack Fogel was appointed project leader, he continued this practice but he also met frequently with Bret O'Brien, Gerson, and Mukerjee individually or together to brainstorm solutions to problems that had arisen.

In addition to Fogel's various departmental responsibilities within production, he was responsible for the final assembly of the IntensCare product. Fogel characterized his role on the team as follows:

> I try to keep all ends tied together for the net result. Where are we on software development and testing, engineering design, order and delivery of the component parts, and fabrication planning? I tie all the pieces together to make sure they hit the floor at the same time. I make sure communication is happening so that all things are getting done.

While the team had made significant progress in the six months since it had been reconfigured, Fogel knew there were still difficulties to overcome if they were to meet Beaumont's very aggressive release date.

On February 2, 2009, Mukerjee sent everyone a terse text message that suggested even bigger problems to come, as O'Brien's critical path depended on getting the software in final form by May 1: "Problems again with delivery dates from India. Need to talk to you asap."

On February 12, O'Brien e-mailed Fogel:

> Jack,
>
> We are running into some serious engineering problems trying to fit the data displays and battery units into the customer size specs Marketing provided. Can you spare some time tomorrow to meet alone with me and Aaron to brainstorm solutions to this? I know we have a meeting tomorrow afternoon with the whole team, but we need to do some serious thinking together before we put this in front of the rest of the team. I can't afford the time to deal with Valerie's predictable drama over this.
>
> Bret
>
> P.S. Have you talked to Dipesh recently about the delays with the software? Any updates?

"Bret's right," Fogel muttered to himself; "Valerie is going to go through the roof if she hears about these two major problems. We'd better get these issues and the specifics all nailed down before we bring these up in the team meetings."

Merz had her own critical path to product launch, and any major problems in product design would create a cascade of delays in the marketing of the product that the IntensCare business plan could not accommodate, from the production of marketing copy to the development and publication of technical installation guides to the final development of the webpages devoted to the system. In fact, she was hoping that an accelerated time line might leave room for at the least the initial planning of how the monitoring system could be modularized for the variety of clinical situations where the system might be used, from military surgery units to neonatal intensive care. While she was not counting on this, she felt she had to demand it now if she had any hope of getting it in the next version.

Merz's experience to this point with her colleagues on the IntensCare team had not given her much confidence in their competence in general or, more particularly, in their ability to deliver the product that Beaumont and the market were expecting. She was very frustrated with Fogel as the team leader. Having led two other major product development teams for her former employer, Merz knew what was possible "when the team leader was really in the driver's seat." Yet, here she was responsible for the IntensCare's P&L, but not in a formal position to get the other team members to deliver. She described her relationship with the product and the team this way:

> I feel my position is mini-general manager. I have ultimate responsibility for profit and loss on IntensCare. The engineers and production staff don't report to me, but I'm responsible for refining the product road-map. If I don't keep on them, they'll stray to other projects. I provide the technical support to customers: the training, the hotline, the technical support for field reps. I'm in charge of pricing, advertising, and sales promotion activities. I have all the responsibility but no authority to get others to live up to their commitments. I have no idea what Jack is doing, but it looks like he is just another "good guy" who doesn't want to ruffle any feathers. Bret and Aaron always seem to have each other's back. And who knows what Dipesh is doing; I worry that this offshore development is going way off track and no one even knows.

Bret O'Brien was the lead engineer on the IntensCare project; he also managed several other engineers working on redesigns for the two existing MediSys systems and on one new system in the early stages of development. At the formal start of the project six months earlier, O'Brien had two

other engineers reporting to him who worked full time on the IntensCare. However, due to recent recession-driven companywide cutbacks, those engineers now split their time between IntensCare and other projects. O'Brien knew from the beginning that his staff would be deeply challenged to meet the aggressive deadlines: "It was already almost mission impossible; this product is as complex an integration of software and hardware as any NASA project, not to mention all the other pressures to accelerate the time line." And that was before the staff reductions. Now his solitary focus was on designing a high-quality product as quickly as he could. He had resigned himself to accepting the constant berating from Merz about the time line, coping with it by avoiding her as much as possible. "Let Jack give her the bad news," he told himself. "After all, they are the two that will get all the glory for this product."

O'Brien described his view of the roles of the various functions within the team:

> We all have very different drivers, which really complicates our ability to make good decisions together. Marketing is revenue-driven, and this product should be a big revenue generator. Production likes the product because it shows off their ability to manage a complex supply chain of software and hardware components. Of course, we in Design and Engineering are also integrating the software and hardware elements into the design, but Dipesh and I are too busy with our own parts of this complex project, and he spends so much time in India with our software contractor that we never get to talk about integration in any big-picture way. I operate pretty much on my own. My objectives in engineering are to deliver at cost, on time, and with specified features. Dates are my driver, and quality too. And Regulatory—well, their role is to throw roadblocks in front of everyone.

Karen Baio, the lawyer who represented Regulatory Affairs on the team, knew that she was seen as an obstructionist by most of her teammates. "Sometimes their childishness really bugs me," she reported. "They act like this whole effort is some kind of game we are trying to win, instead of an important healthcare initiative that will save many lives and therefore must function perfectly and operate within the law." Baio's patience and persistence were well-known throughout the company, as she had been with MediSys for many years. She found Mukerjee and Merz increasingly difficult to tolerate. Software developed overseas was notoriously problematic in the medical diagnostics field, yet Mukerjee acted like this was a non-issue. A hotshot newcomer to MediSys (like Merz), he regularly asserted his expertise and substantial experience with developing and testing medical diagnostic software and dismissed Baio's concerns about the time required for adequate testing of externally produced software before integration into the IntensCare system.

But it was Merz who really got under Baio's skin. "Valerie sees herself as MediSys's savior," Baio commented. "She is self-centered, myopically focused on marketing, and very aggressive in our meetings." Like others on the team and even in Marketing, Baio wondered what signal Beaumont was sending to the company by personally hiring someone like Merz. Baio described several instances in which Merz downplayed the risks of failing to test the product thoroughly, insisting that "lead users will help us test" the system once it was installed. Baio was almost looking forward to the upcoming meeting where she suspected Merz would turn red with anger when she heard there were expected delays in the product design—a rumor Baio had heard from Gerson.

For his part, Aaron Gerson was fairly confident that IntensCare would be a big hit in the marketplace. He wasn't as worried as his teammates about the time line and aggressive goals; he had seen many an executive try to push product development faster and fail. He also knew the competition well and didn't believe they were capable of getting a better product to the market faster than MediSys could. His only concern was the new offshore software development, an unknown

they had not dealt with in previous products. While Mukerjee seemed competent and confident, Gerson was withholding judgment on whether this outsourcing approach could be both successful and cost-effective.

A Sticking Point: Modular Design

One of the most hotly debated topics among the IntensCare team members regarded modules. By creating a modular design within the system, the customer would be able to tailor the system to a variety of clinical situations, (e.g., neonatal intensive care, day surgery, or field hospitals), and thus have greater flexibility.

Merz firmly believed that customers demanded a modular design:

> The hospital equipment distributors we have interviewed are insistent that a modular design will allow them to sell our system into a much wider set of segments from hospitals to military organizations to a variety of clinical arrangements. Furthermore, the two competitors who have announced their plans to enter the field have described what is essentially a modular design.

While Merz believed that IntensCare had to be modular, she thought modularity might be introduced in the second version, after the initial product introduction. She had not expressed that view to her teammates because she feared that such a compromise suggestion would be used by engineering as an excuse to continue ignoring the demand for modularizing anything.

O'Brien acknowledged that engineering had no intention of developing these modules – at least for this version of the system. He and his staff were at capacity just trying to solve the internal space problem, which was critical to meeting the launch deadline; they couldn't waste time with redesigning for modules. "Besides," noted O'Brien, "modules were addressed only in the most general terms in the original 2007 IntensCare business plan, so we never designed for them, nor did we specify such requirements for the software people." It seemed that the team was at loggerheads over how to proceed on this issue.

February 13, 2009

IntensCare was behind on design, clinical testing, and production schedule. Still, the team was fighting to meet the August deadline for introducing the monitoring system to the marketplace. The marketers were busy preparing a training video for technical installation and another for medical users; software designers in the United States and developers in India were in constant communication about the programs; the engineers had their hands full with the space problem; and the production engineers were ordering components and arranging the assembly lines. Regulatory was revising clinical test protocols and schedules. The team as a whole still had to decide about modules.

Art Beaumont was aware of the difficulties confronting the team:

> We have several problems going on right now. But I know all these people are really working hard to resolve them. Now, if I jump in there and shout or accuse them, what I'd basically be saying is that I don't have faith in the people I've assembled to get the job done, and I don't think they're giving it their best effort. And that's not what I should be doing. My job is to support them, not to shout at them.

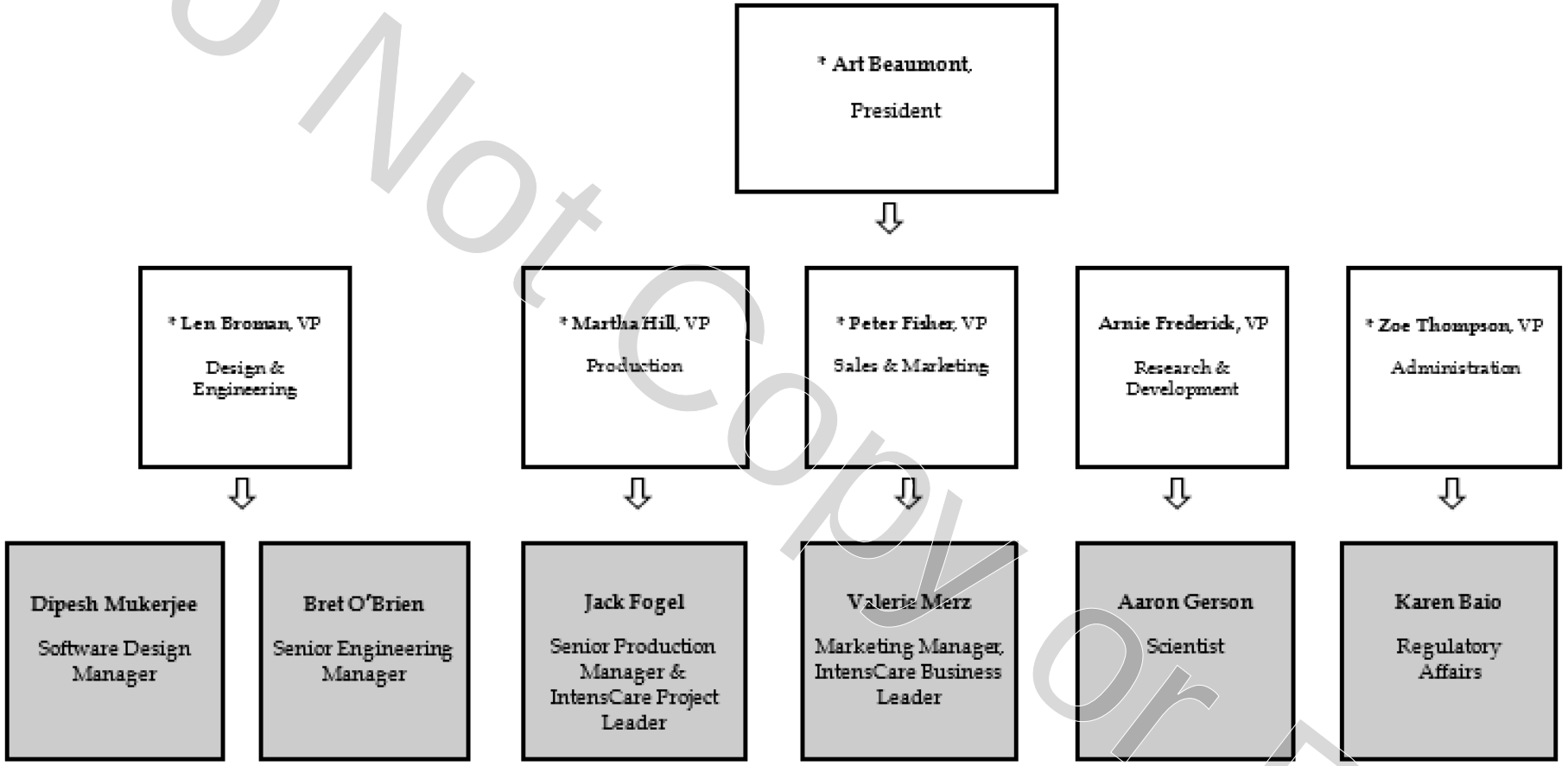
Still, pressure was intense. Production would have to start soon to assure projected market introduction. Any additions or changes to the design would threaten a delay in production. At the same time, IntensCare had to meet strict quality and regulatory standards as the company adjusted the product to satisfy market needs.

As Valerie Merz was headed to lunch just before the Friday meeting, she walked past a conference room near Bret O'Brien's office. She couldn't help hearing him complaining loudly to Fogel:

> Look, Jack, if you don't get that woman off my back about this modular issue, I am going to demand to be let off this team. As it is, there is no way I can even come close to meeting our scheduled milestone of handing the design off to your people! And you know there are even worse delays coming from the Indian software team. Why don't you call off today's meeting and we'll get your boss and mine in here and give them the straight story?

Merz stopped in her tracks, tightened her fists, and took three deep breaths. If she walked into that conference room, there was no telling what she might do or say. Maybe she should turn around and walk right into Beaumont's office and hand in her resignation.

Exhibit 1 MediSys Organization Chart, 2009



Note: Shading indicates IntensCare core team members; asterisk indicates Management Committee members.

Exhibit 2 Time line of IntensCare Product Evolution

September 2006	R&D person gets inspiration for the product
October 2006	Sales person vets the concept in the market
December 2006	Conversations include software designer
June 2007	Ad hoc team presents product concept to senior leaders
July 2007	Senior leadership of MediSys allocate $500,000 to development of IntensCare
January 2008	Beaumont hired as president
August 2008	Beaumont formalizes NPD and charters a core team to develop IntensCare
August 2009	Projected IntensCare launch date

Exhibit 3 Beaumont's Annotations on HR's List of Prospective Team Members for IntensCare

Karen Baio, Regulatory Affairs

Employed in 2002. J.D. 1989 from University of Illinois. Previously employed by Pfizer. Zoe Thompson rates her as high performer. *Sharp woman. Watch for general counsel potential.*

Jack Fogel, Senior Production Manager

Employed in 2002. B.Eng. 1971 from Tufts University. Led the renal monitoring system launch. High performer, well-respected by colleagues in production and engineering. *Seems a bit laidback for this job, and not as business-focused as I'd like but no one else has the experience of launching such a product*

Aaron Gerson, R&D

Employed in 2002. PhD 1972 from M.I.T. Lead scientist on both monitoring products. Has four patents. High performer. Created the IntensCare product concept and was ad hoc leader of the group that did early development of the project. *Brilliant, need to keep this guy involved in company long-term. Could replace Arnie if he wanted to*

Valerie Merz, Marketing Manager

Employed in 2008. MBA 1997 from Stanford University. Came with very high recommendations from competition. Peter Fisher rates her as his top performer. *I like her. A real go-getter, could be GM material when we grow up.*

Dipesh Mukerjee, Software Design

Employed in 2004. 2002 M.I.T. graduate, previously employed by General Electric Healthcare. *Ambitious guy, very intelligent. This may be too much for him at this stage, but I think he is determined to prove himself.*

Bret O'Brien, Product Engineering

Employed in 2002. M.S. 1991 from Georgia Tech. Previously worked for Philips. High performer. Led the engineering effort on the pulmonary systems. Len Broman rates him highest performer in the group and has personally groomed him as a manager. Part of ad hoc team for early development of IntensCare. *This guy seems very expert but narrow. Can he be developed into a project leader? Does he get the business issues? Fisher says he's passive aggressive.*