

Robot Technologies, Inc. (A)*

“At RTI, we believe there is a better way to accomplish many of the dull, dirty and dangerous tasks that face us today.” Annual letter to shareholders.

In early June 2008, Eldon Kennedy, CFO and Treasurer of Robot Technologies Incorporated (RTI), was busy reviewing the company’s working capital position. It was his custom to forecast cash needs for the next six months in December and June of each year and to formulate plans for meeting such needs. As he contemplated preparing a cash budget for the last six months of 2008, he wondered whether winning the new military contract would be good for the company.

Background

RTI was founded by roboticists who were educated and performed research at the California Institute of Technology (Caltech). Over two decades, RTI developed proprietary technologies incorporating advanced concepts of navigation, mobility, manipulation and artificial intelligence.

As of early 2008, RTI designed, manufactured and sold robots that help people complete “dull, dirty or dangerous” tasks. RTI’s consumer robots perform time-consuming dull and dirty domestic chores such as vacuuming and mopping floors. The VacBot (Exhibit 1) was designed to replace the standard home floor vacuum cleaner and came in several models ranging in suggested retail price from \$149 to \$329. RTI sold over 1.5 million VacBot vacuuming robots since 2001, but market penetration was still only about 1% of North American homes at yearend 2007. The MopBot floor-washing robot (Exhibit 1) retailed for \$399 and replaced the task of manually sweeping, mopping, scrubbing and drying hard surface floors. RTI sold its consumer robots through the company’s on-line store and national retailers including Sears, Target, and The Home Depot.

In recent years, RTI also developed the PackBot tactical military robot, which performed dangerous battlefield reconnaissance and bomb disposal (Exhibit 1). RTI sold these devices to the U.S. military and other government agencies worldwide. The PackBot military robots were priced at approximately \$100,000 per unit. In the past several years, RTI sold more than 500 of these military robots to the U.S. government, most of which were deployed on missions in Iraq and Afghanistan.

Management believed their expertise in robot design and engineering put the company in a position to experience significant growth in the coming years:

* Prepared by Robert Bowen and Lloyd Tanlu for classroom discussion. The comments of Alex Edwards and Allison Koester are appreciated. While modeled after a real world company, all data are fictitious and no inferences should be drawn about the performance or financial condition of any company. Revised December 8, 2009.

We believe the sophisticated technologies in our existing consumer and military applications are adaptable to a broad array of markets such as law enforcement, homeland security, commercial cleaning, elderly care, home automation, landscaping, agriculture, and construction. Our strategy is to maintain a leadership position in pursuing new applications for robot solutions by leveraging our ability to innovate, to bring new products to market quickly, to reduce costs through design and outsourcing capabilities, and to commercialize the results of our research, much of which is government funded.

RTI became a public company in 2005, when for the first time, a robot sounded the opening bell on the NASDAQ stock exchange. RTI's balance sheets and income statements are in Exhibits 2 and 3, respectively.

2008 and consumer robots

Demand for the RTI's consumer robots remained on a steady upward trend through mid-2008. Monthly shipments during the first half of 2008 averaged about 45,000 units per month at \$210 each. The product mix of consumer robots had remained relatively constant and Kennedy forecast that sales in the last six months of 2008 would increase to an average of about 50,000 per month, partially due to anticipated higher sales during the holiday season. Exhibit 4 contains the company production and sales forecast for the last half of 2008.

Estimated average per-unit direct costs of producing each consumer robot were materials, \$58 and labor, \$43. A minimum inventory of 3 months' supply of raw material was currently considered necessary because of unsettled market conditions. Work-in-process inventory for consumer robot production was expected to remain at the present level. All current inventory was usable. The length of the production process was 1 week. Units were shipped as soon as produced, and terms of sale were "net/30" (i.e., sales were made on payment terms where the full amount was due in 30 days). The company had a backlog of orders for 350 consumer robots.

Kennedy worked out a tentative purchase schedule for the various material requirements (Exhibit 5). It shows the amounts of purchases in the months that they were expected to be booked. The great majority of the company's purchases were net/30. Invoices were paid promptly when due. Wages were paid every Friday for the current week.¹

Monthly indirect expenses were expected to be as follows: depreciation, \$140,000; other factory overhead, \$1,750,000; and selling, general, and administrative (SG&A), \$2,500,000. An additional \$1,500,000 would likely have to be spent for the replacement of old machinery used in the production of the consumer robots. This machinery appeared to be nearing the end of its useful life, but there was no way of knowing when it would finally break down. The depreciation on the new equipment will likely be the same as the depreciation on the old machinery being replaced.

¹ In 2008, there were 4 paydays in July, 5 in August, 4 in September, 5 in October, and 4 in November and December.

2008 and the PackBot II

In April 2008, the U.S. Department of Defense (DOD) invited RTI to bid on a contract for the manufacture of 450 specialized PackBot IIs (plus one prototype). The robot was designed to perform basic reconnaissance for military and public safety professionals, including bomb identification, hostage situations, search and rescue and other dangerous missions. The PackBot II was designed to climb stairs, maneuver through otherwise inaccessible areas and provide the robot's operator with real-time video and two-way radio.

RTI management decided to submit a bid because they believed that a decent profit could be made on the PackBot II. The first bid of \$105,200 a unit was rejected, but a second bid of \$98,900 was accepted. A single prototype was to be produced during July 2008 for the purpose of testing design and production methods. It was to be retained at the plant, but invoiced on September 1, 2008 at \$98,900. This experimental unit was to be manufactured from materials on hand. Management felt they could build the prototype using the existing labor force. Direct labor for this unit was estimated to be \$55,000. The lessons learned making this first unit were expected to enable the company to start PackBot II production at full scale on or about September 1. Kennedy expected that production could be maintained at a fairly constant rate through November. Delivery of the PackBot IIs was to start the first week in October and was to be made at the rate of 150 units a month during October, November and December (Exhibit 6).

Estimated per-unit direct costs of producing the PackBot II were as follows: labor, \$25,000 and materials, \$60,000. In addition to the estimated direct labor cost of \$25,000 per unit, Kennedy estimated that the build-up of the additional labor force needed for robot production would require some \$400,000 in extra wage expense for hiring and training during August. Similarly, some \$500,000 of additional wage expense was budgeted for December so as to permit less abrupt reduction of the work force upon completion of the contract. Virtually all of the \$500,000 would be paid out in the first three weeks of December.

A tentative schedule of raw material purchases for the PackBot II is presented in Exhibit 7. The production process from raw material to finished product was estimated to take a month for the PackBot II. The military would accept shipments in lots of 75 units and payment would be received about 60 days after shipment.

Tooling for the DOD contract was expected to start in July. During July and August tooling expenses and experimental manufacture of the prototype were expected to increase factory overhead by about \$610,000 a month. Starting in September, when full-scale production of the specialized PackBot IIs was to begin, factory overhead was expected to become about \$2,300,000 per month until the end of November. In December, overhead was expected to return to its normal level. SG&A was expected to increase to about \$2,800,000 a month from September 1 through the end of December.

The DOD contract would make it necessary to purchase \$375,000 of special tools. Delivery of these tools was expected in August; it was to be paid for in "cash on delivery" (C.O.D.). Upon completion of the contract these tools would be scrapped with no salvage value.

Banking relationships

The company maintained a cash account with the First National Bank, a large regional bank. The company had originally banked with the Farmers and Merchants Bank, a local institution from which it had borrowed from time to time to help finance production of government contracts and deal with the seasonality of the consumer robot line. In recent years, however, Kennedy sensed that Ralph Applegate, the bank's president, was becoming apprehensive about lending money to the company. Kennedy attributed this reluctance to the fact that Applegate had little experience in lending money to industrial companies. Because of this, the greater portion of Farmers and Merchants Bank's commercial loans were to local and regional retailers. Kennedy, with RTI senior management approval, moved the company's funds to the First National Bank. Kennedy had discussed the company's prospects in general terms with First National Bank's officers on a number of occasions, but they had never requested a loan.

Kennedy considered RTI's current cash balance of over \$20,000,000 to be in excess of operating needs. He was willing to reduce cash to a minimum of \$10,000,000.

It was Kennedy's policy not to plan more than 6 months in advance, since he believed it was impossible to predict with any accuracy what was going to happen for a longer period. The company's plans for the first half of 2009 would be made in the light of conditions as they developed and of the company's prospective financial condition at the end of December 2008.

Questions:

1. Evaluate the incremental profitability of the contract for the specialized rough-terrain PackBot II.

2. Incorporate the PackBot II contract and evaluate the cash needs of the company for the last six months of 2008. Hints: set up a worksheet with columns for each month (July-December, 2008) and develop a schedule of monthly cash inflows and outflows. In preparing this schedule, assume the following:

- All accounts receivable as of June 30, 2008 are collected in July, and all June 30, 2008 accounts payable are paid in July.
- Work-in-process inventories, other current assets, and accrued liabilities will remain constant at their June 30, 2008 levels, i.e., you do not have to forecast changes in these accounts.
- The \$1,500,000 machine will be purchased on July 1, 2008.
- Interest income on cash balances is insignificant and can be ignored.

Remembering RTI's desire to have a minimum cash balance of \$10 million, what does your schedule reveal about RTI's borrowing needs over the last six months of 2008?

3. In preparing your cash budget, what uncertainties would you be concerned about? How might this effect the company's cash needs?

4. [Optional] Prepare pro forma financial statements. Use the data from the case and from your cash flow worksheet to prepare (i) an income statement for six months ending December 31, 2008, (ii) a balance sheet as of December 31, 2008, and (iii) a cash flow statement for the six months ending December 31, 2008. Assume a tax rate of 30 percent, and that taxes for each year are not paid until April of the following year. Ignore interest on any new borrowings that will be needed during these six months. Assume the old machine replaced in July had originally cost \$1,000,000, was fully depreciated, and had no residual value. For preparing these three statements, you may find it useful to draw up T-accounts for each balance sheet and income statement account, and post six-month totals from your cash budget developed in #2 above (appropriately adjusted to the accrual basis) to these accounts.

Exhibit 1

Robot Technologies products as of December 31, 2007



Consumer 'VacBot' vacuum cleaner



Consumer 'MopBot' hard surface floor cleaner



Military 'PackBot' robot



Soldier carrying 'PackBot'

Exhibit 2
Robot Technologies, Inc
Balance Sheets

(in \$000)	June 30 2008	Dec. 31 2007	Dec. 31 2006
ASSETS			
Current assets			
Cash	\$ 20,657	\$ 17,617	\$ 12,428
Accounts receivable, net	10,235	11,648	14,702
Inventory			
Raw material	8,684	6,848	4,147
Work in process	350	249	172
Finished goods	-	3,024	6,021
Other current assets	123	613	256
Total current assets	40,049	39,999	37,726
Non-current assets			
Plant and equipment, at cost	21,245	18,873	15,909
Less: Accumulated depreciation	(5,643)	(4,148)	(3,754)
Plant and equipment, net	15,602	14,725	12,155
Total assets	\$ 55,651	\$ 54,724	\$ 49,881
LIABILITIES & SHAREHOLDERS' EQUITY			
Current liabilities			
Accounts payable	\$ 2,672	\$ 2,758	\$ 3,333
Accrued expenses	2,065	1,970	2,153
Total current liabilities	4,737	4,728	5,486
Non-current liabilities			
Long-term debt	2,430	2,180	-
Shareholders' equity			
Capital stock	46,905	46,905	45,106
Retained earnings	1,579	911	(711)
Total liabilities & shareholders' equity	\$ 55,651	\$ 54,724	\$ 49,881

Exhibit 3
Robot Technologies, Inc
Income Statements

(in \$000)	June 30 <u>2008</u>	Dec. 31 <u>2007</u>	Dec. 31 <u>2006</u>
Sales, net	\$ 54,418	\$ 102,874	\$ 83,027
Cost of sales	<u>38,608</u>	<u>71,919</u>	<u>55,498</u>
Gross margin	15,810	30,955	27,529
Selling, general, and administrative expenses			
Selling and marketing	8,123	15,622	14,965
General and administrative	3,837	7,132	6,973
Research and development	<u>3,010</u>	<u>5,855</u>	<u>5,694</u>
Total operating expenses	<u>14,970</u>	<u>28,609</u>	<u>27,632</u>
Net operating income	840	2,345	(103)
Tax expense (benefit)	<u>172</u>	<u>723</u>	<u>(384)</u>
Net income	<u>\$ 668</u>	<u>\$ 1,622</u>	<u>\$ 281</u>

Exhibit 4
Robot Technologies, Inc
Production and Sales Forecast in Units: July 2008 – December 2008
Consumer Robots

	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Production Plan, Consumer robots	50,000	50,000	50,000	50,000	50,000	50,000	300,000
Sales Forecast, Consumer robots	40,000	40,000	44,000	46,000	55,000	75,000	300,000
Change in Inventory	10,000	10,000	6,000	4,000	(5,000)	(25,000)	-
Cumulative Inventory	10,000	20,000	26,000	30,000	25,000	-	-

Exhibit 5
Robot Technologies, Inc
Tentative Schedule of Purchases: July 2008 – December 2008
Consumer Robots

	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Raw material, Consumer robots	\$ 2,916,000	\$ 2,900,000	\$ 2,900,000	\$ 2,900,000	\$ 2,900,000	\$ 2,900,000

Exhibit 6
Robot Technologies, Inc
Production and Sales Forecast in Units: July 2008 – December 2008
PackBot II

	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>	<u>Total</u>
Production Plan, PackBot II	1	-	150	150	150	-	451
Delivery Schedule, PackBot II*	-	-	1	150	150	150	451

*July prototype is invoiced in September but held on site

Exhibit 7
Robot Technologies, Inc
Tentative Schedule of Purchases: July 2008 – December 2008
PackBot II

	<u>July</u>	<u>August</u>	<u>September</u>	<u>October</u>	<u>November</u>	<u>December</u>
Raw material, PackBot II	-	\$ 9,000,000	\$ 9,000,000	\$ 9,000,000	-	-
Special tools, PackBot II	-	<u>375,000</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
Total	-	\$ 9,375,000	\$ 9,000,000	\$ 9,000,000	-	-