
A surgeon wearing a green surgical cap and mask is performing laparoscopic surgery. They are seated in a blue ergonomic chair, focused on the procedure. Two white robotic arms with articulated wrists are positioned above the patient's abdomen, which is covered by a green surgical drape. A monitor in the background displays a grayscale 3D image of the internal organs. The overall theme is advanced medical technology and precision.

RoboTech: Storming into the U.S. Market

Case Study Analysis

The first part of the case describes how RoboTech decides to diversify away from its core industrial robot business by leveraging its well-developed expertise into the medical devices field. It succeeds in creating a specialized robot, the first product of its kind for the spinal surgical market segment.

1. How would you characterize in detail RoboTech's product-market fit after this iteration?

Value propositions

Solution:

Spinal surgery robot

Expertise in motors,
motion control, sensors
and miniaturization.

Small, precise and strong
devices

Unique features:

3D imaging software: exact
map - no need to adjust
during surgery.

1.5mm accuracy in
mechanical drills and
implants

Simulation to help the
surgeon to practice
operation

Key Benefits

Surgeons stop needing to
update imaging constantly.
Better vision.

May practice beforehand
using the computer-based
simulation.

Patients not satisfied with
the operation outcome
despite of reported
success rate of 98%.
Positive results should
increase.



Customer Archetype

Target:

Elder population(in growth).
360k thoracic or lumbar
procedures annually in the
US.

Both small and giant surgery
centers. From those, 1k to
1.5k institutions can afford.
Only the **bigger hospitals**
should be able to **invest**.

What does the customer want?

Customer want **proof**
technology works and fear
their surgeons **won't know**
how to operate. If surgeons
get more **comfortable** and
more hospitals **adhere**, a
domino effect will be
created.

**The industry inertia will
influence itself.**

Competition:

Other companies offer
surgical tools and
implants.

A few orthopedic
robots in other areas.
Not yet into robot
development in spinal
surgery.

What is the robot being used for?

Job to be done:

Patients are not satisfied with the procedure outcome.

The operation is hard to execute. Too precise job, lack of vision and constant need to re-evaluate mid-operation.

Surgeons need help operating. Two key attributes are needed:

- Simplicity
- Efficiency.

Customer workflow

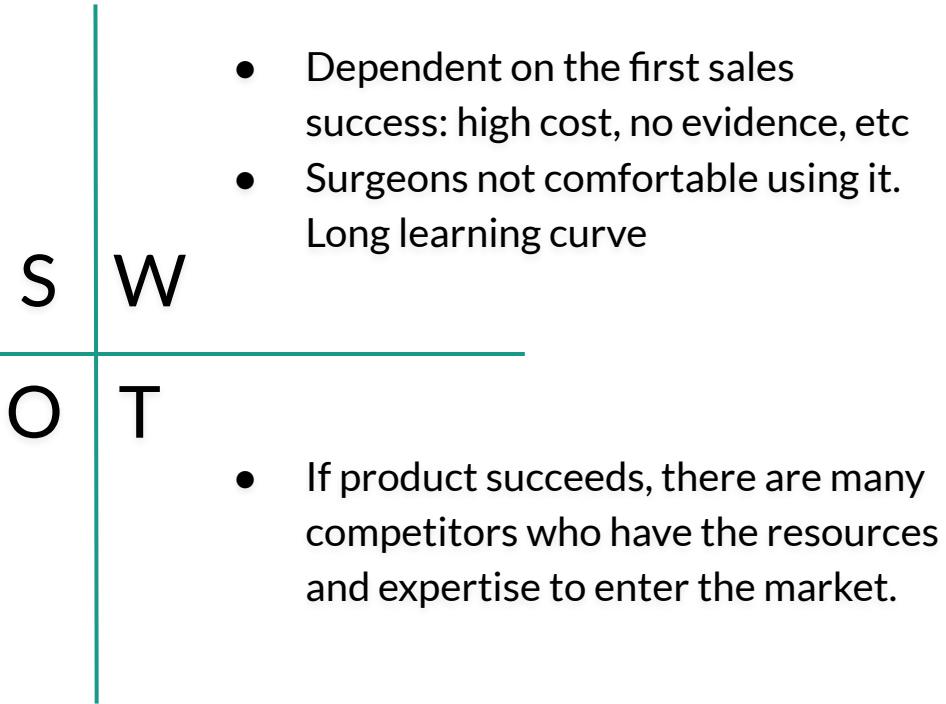
In the beginning it will be hard to integrate it in their everyday life.

After the initial learning cap. the surgeons will be able to map correctly the patients' problems and the operation will increase significantly the success rate.

This will generate interest from the possible patients and eventually, with the request augmentation, the investment will pay off.

SWOT Analysis

- Dominant and expert in the robot industry.
- Bringing new tech to the surgery business





PESTEL Analysis

Political: Obamacare. Major shift in the health care system. Instability despite the reimbursements.

78 million untreated back pain cases (11 in the U.S.)

Economical: 34.5 billion market., 20% spinal; 75% of the business on top 3 companies; 1k to 1.5k can afford the 870k\$ price

Sociological: Elderly growing population. The target.

Technological: Not first in surgery robots. First in spinal surgery. Robotech has the expertise.

Environmental: Nothing to report.

Legal: Food Drug and Administration(FDA) regulatory approval obtained quickly.

2. How would you characterize in detail RoboTech's business model components related with connecting to customers after this iteration?

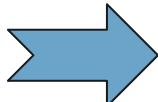
Customer relationships: how do we get, keep and grow customers?

Sep. 2013: RoboTech U.S.

- Sales office in Chicago
- U.S. Sales Director

Jan. 2014:

- 6 Sales representatives:
U.S. Sales Director, a service tech, four staff in office, training and support roles



Three-pronged strategy:

- Targeting key facilities
- Training orthopedic surgeons
- Educating patients

Customer relationships: how do we get, keep and grow customers?

- Contact top academic competitive hospitals with high influence. **Domino**
Effect: getting 1 or 2 to commit to the device would bring the other along
- Open a center to offer hand-on experience to leading surgeons, who would in turn advocate for the system at their hospitals
- Contact a public relations company to present spinal surgery candidates with information about the new technology

Obtain press coverage emphasizing this breakthrough innovation and patient success stories, with the help of the PR firm



Customer relationships: how do we get, keep and grow customers?

Opinion of industry analysts about robotic implant surgery can influence customers

- Prediction: it would become the de facto standard in knee and hip surgery within 5 years and in spinal surgery a few years later
- Once 35% using this technology, hospitals without these systems would risk losing their best doctors



Revenue streams: How does the company make money from each customer segment?



1000 to 1500 of institutions would afford:

- The system price of \$869,000
- An annual four-year service contract at \$55,000 after year one
- Disposables at \$1800 per procedure

Each hospital would perform between 75 and 85 procedures annually.

Revenue streams: How does the company make money from each customer segment?

Initial estimated gross profit margins:

- Only 45% for machine sales (outsourced components)

- Service contracts: 70%
- Disposables: 60%

More profitable



Profitability was expected to rise

Revenue streams: How does the company make money from each customer segment?

The Second Year

Customers' discontent

- 30% deposit to guarantee the product
- Slow production capacity
- Missed delivery promises



By year's end

- 55 sales
- 20 more units on back order



3. How would you characterize in detail RoboTech's business model components related with operations after this iteration?

Key Partners

- RoboTech collaborates with surgeons and medical professionals to gather insights, feedback, and requirements to guide the development and refinement of the specialized robot, as well as in training and adoption efforts.
- RoboTech partners with regulatory authorities to ensure the safety, efficacy, and market approval of the new specialized robot.



Key Partners

- RoboTech works with hospitals and surgical centers to introduce the robot, provide training, and establish protocols for its integration into surgical workflows.
- As RoboTech signed contracts with the partners that supplied the specialized components used by the prototype, and even though this outsourcing reduced the company's investments needs, it also meant that it left it vulnerable to its suppliers, particularly on price



Key Activities

- RoboTech's research and development efforts focus on refining and enhancing the specialized robot, including iterative design improvements, software updates, and algorithm enhancements to optimize surgical precision, safety, and ease of use.
- RoboTech's manufacturing and production activities involve translating design specifications into physical products, sourcing components, assembly, quality control, and testing to ensure compliance with quality standards and regulatory requirements.



Key Activities

- RoboTech's sales team engages with hospitals, surgical centers, and key stakeholders to create awareness and generate demand for the specialized robot.
- RoboTech provides comprehensive training and support services to ensure successful adoption and utilization of the specialized robot, including technical support, troubleshooting issues, and regular software updates.



Key Resources

- RoboTech's intellectual property protects its innovative technology and provides a competitive advantage in the spinal surgical market segment.
- RoboTech's team of engineers, software developers, and medical experts possess specialized knowledge and expertise in robotics, spinal surgery, and software development, essential for advancing the technology.



Key Resources

- RoboTech requires dedicated manufacturing facilities with advanced machinery, equipment, and tools to ensure consistent and reliable production.
- RoboTech's sales and support team provides technical assistance, training, and ongoing customer support to ensure customer satisfaction and maximize the adoption and utilization of the specialized robot.



Costs

- R&D expenses for developing and refining a specialized robot include salaries, prototyping, clinical trials, regulatory compliance, and software updates.
- Manufacturing and production costs include materials, labor, equipment maintenance, and facility overheads.



Costs

- RoboTech allocates funds for sales and marketing activities to create awareness and generate demand for the specialized robot.
- Training and support services require a significant investment in personnel, materials, and infrastructure.
- RoboTech must allocate resources to ensure compliance with regulatory standards and obtain certifications.



Initial sales are strong, and RoboTech's prospects look very good. However, the U.S. market soon begins to change quickly and dramatically on several dimensions.

4. What changes in the business model resulted from this evolution? What do you think was done more effectively and where has it fallen short? Why?



Business model evolution across the years (2014 to 2017)

- Changes were not all simultaneous
- Adaptations to the disparity between expectation and results obtained
- Constant evaluation of the evolution of the market

Results in the first year (2014)



- Expected Sales: 25 devices
- Effective Sales: 24 devices + 6 back order
 - Major office overwhelming -> long delays and communication breakdowns
 - Client satisfied with the product but not with acquisition process huge delays

Market/Environment Evolution in 2014



- With the advancement of reimbursement practices, sales moved to a bundling model which included everything.
 - This bundle's cost (around \$34k) was below the expected reimbursement (about \$50k)
 - Israeli company Mazor Robotics entered the US market

Measures taken after first year



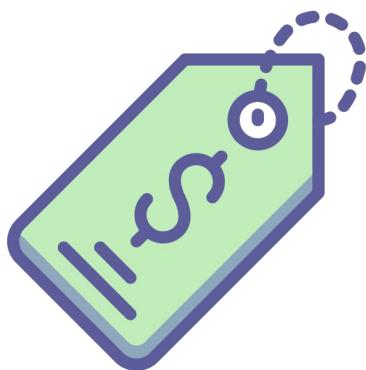
- Expand manufacturing capacity to 80 units for next year.
- Buying decisions shifted from physicians to administrators.
- Sales staff spend more time managing the sales process, and document cost savings associated with less repeated surgeries.
- Introduced 30% pay deposit to guarantee a place in production schedule.

Results in the second year (2015)



- Expected Sales: 60 devices
- Effective Sales: 55 devices + 20 back order
- Failure of pay deposit, as promises weren't being kept and client discontent increased even more.
- First profitable year.

Market/Environment Evolution and Measures taken in 2015



- \$4.7B UK company annexes Smith & Nephew enters the US market.
- Production is increased to 110 units per year.

Results in the last year (2016)



- Expected Sales: 100 devices
- Effective Sales: 110 devices + 30 back order

Market/Environment Evolution in 2016



- Medtronic offer to acquire RoboTech. After being declined, they instead acquire Mazor Robotics.
- Market giant Johnson & Johnson joins market together with Verily, a Google affiliate.
- Election of Donald Trump, who increased market instability after vows of ending Obamacare.

Measures taken after last year



- \$18M investment in software/hardware updates to spinal device.
- \$85M investment in dual spinal/brain device.
- \$5M investment in the measures below: Sales force increased
 - Sales force increased from 30 to 45
 - Two new service centers
 - Doubled service staff to 28.
 - Lower price to \$120k to match Stryker's price and undercut Zimmer's.

Strong points

- Constant evaluating and increases in production levels
- Flexibility in staff's roles into administration work
- Very accurate predictions every year

Weak points

- Pay deposits: failure from conception and worse execution
- Production increases were too small for the existing customer list
- Very delayed staff increase

Overall, we conclude that the success was not due to optimal adaptation to the circumstances, but due to the product's edge over the competition.

Finally, multiple forces increase the pressure on RoboTech, which is already under severe strain. Chen must decide how to respond to the company's growing challenges.

5. What should Chen do? How should the company move forward into 2017 and beyond? Which, if any, of the proposed investments should it make and why?



Problem 1: Changes in the Industry

Porter's Five Forces Changes

Substitutes:

- Multi-surgery robots threaten to substitute specialized robots like the one developed by RoboTech

New Entrants:

new competitors have arrived in the market

- Mazor agreement with Medtronic -> increased the capacity of this competitor
- Zimmer with Medtech
- Johnson & Johnson with Verily - future

Problem 2: Changes in the Macro Environment

Political: Obamacare: Trump promises to 'repeal and replace Obamacare'



Economical: 34.5 billion market., 20% spinal; 75% of the business on top 3 companies; 1k to 1.5k can afford the 870k\$ price

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Legal: Food Drug and Administration(FDA) regulatory approval obtained quickly.

Problem 3: Customer Dissatisfaction

Customers were not satisfied with:

- Delays
- Advance payments
- etc.

Customer satisfaction was fulcral in a market about to become a lot more competitive.



Action Plan - Problem 1

Idea

The competition believes multi-surgery robots are the future



State Hypothesis

Business model - new Value Proposition hypothesis:

Base Solution: Multi-surgery robot capable of performing both spinal and neural surgery

To clearly define Value Proposition:

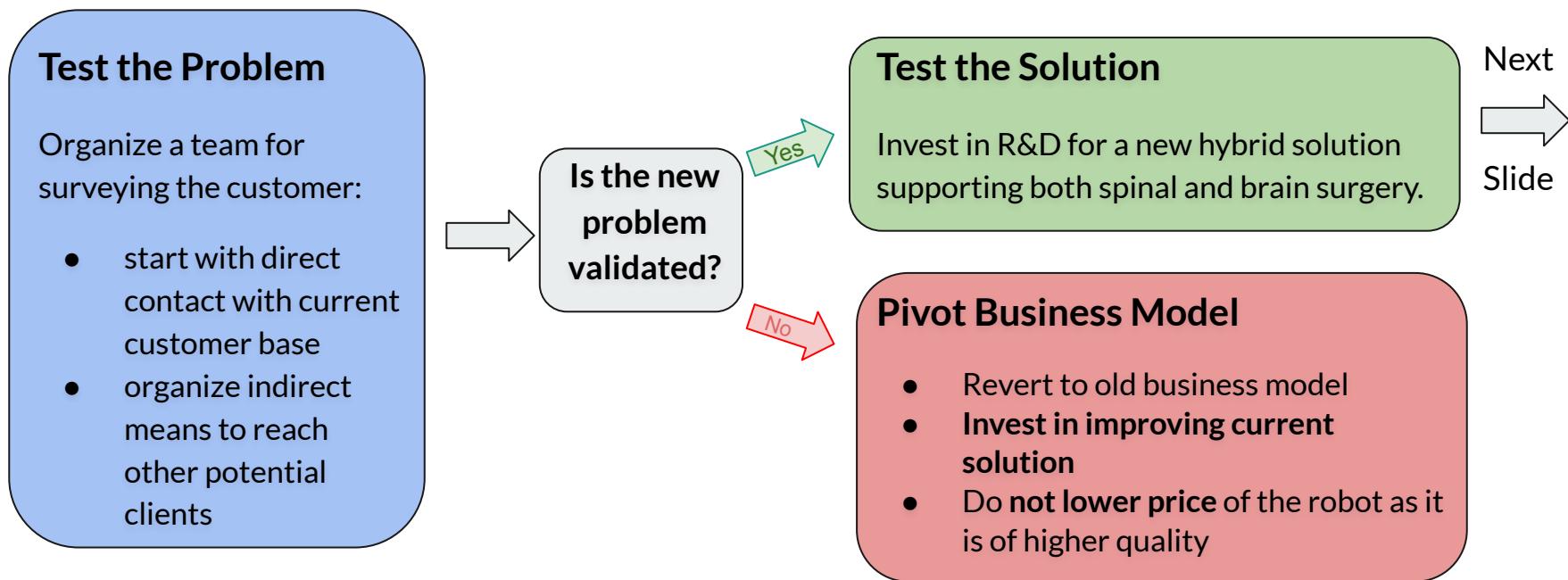
- Analyze to which extent a multi-surgery robot would be better and worse than a specialized surgical robot
- Talk to consultors, experts and internal directors to enhance confidence in these forecasts

Next

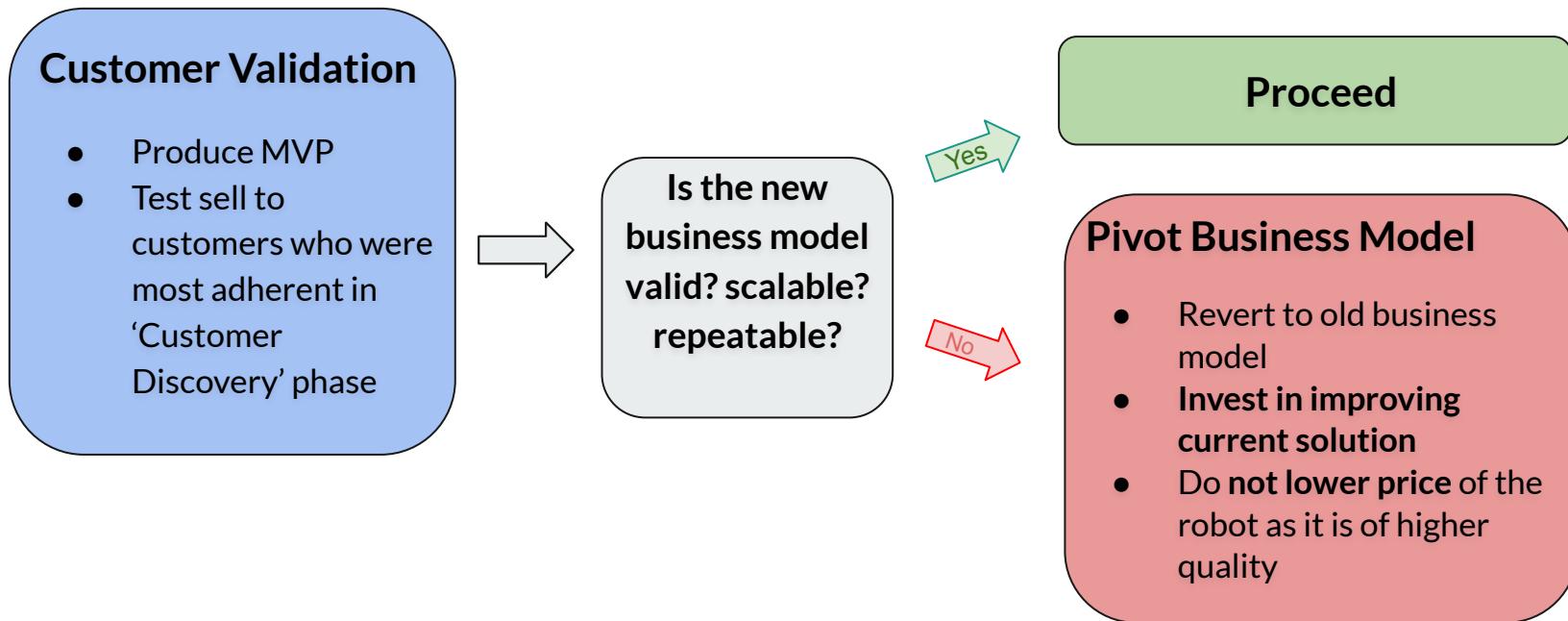


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Action Plan - Problem 1



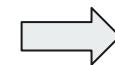
Action Plan - Problem 1



Action Plan - Problem 2

Idea

The market rules were about to change if Trump keeps his promise



New Market Analysis

The company should be **ready to perform another market analysis**, as this change in rules will affect both the Customer Relationships and Customer Segments from their Business Model:

- Less people with insurance means less clients
- Change of rules means different interests from clients

Action Plan - Problem 3

Customer Dissatisfaction

Customers are the heart of a company.

If the customers are unsatisfied, they will seek alternatives.

Previously, there weren't many. **Now the market is full of competitors.**



It is fundamental to increase customer satisfaction



?HOW?

Next
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Action Plan - Problem 3

?HOW?

Invest in new service centers

Invest in increasing the sales force, as it will increase the capacity of the company to process orders and acquire new clients. Increased sales force

Seeing that in the last year the number of back orders still increased, **further increasing production capacity** in Singapore



Action Plan - Conclusion

Not investing is not a solution: the industry is evolving rapidly and the company would quickly die out - invest in either one of the R&D director's proposals, depending on conclusions

Utilizing the current position to its best use: Position the company as an experienced and trustworthy option compared to the other ones, focusing on quality products and higher costs - **do not lower prices**

To maintain/achieve a premium company position, customers' satisfaction must be increased - **invest in sales and services**



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