

## BENCHMARKING AT ULJANIK SHIPYARD

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*David M. Currie and Giorgio Sinkovic prepared this case solely to provide material for class discussion. The author does not intend to illustrate either effective or ineffective handling of a managerial situation. The author may have disguised certain names and other identifying information to protect confidentiality.*

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“Miss Scarlet, I don’t know nothing about birthing babies!” Mario Antic thought of Prissy’s confession from *Gone with the Wind* as he listened to his first assignment as a financial analyst at Uljanik. Before coming to Uljanik, Antic didn’t know much about the process of creating a huge vessel capable of delivering cargo across the world’s oceans. He was surprised how much he had learned in the week since the discussion with his boss. Learning was a testimony to the value of thorough research and thoughtful contemplation.

It was late April 2004, and Antic had only a few days to complete the assignment. As part of its continuous improvement effort, senior management at Uljanik wanted to derive a benchmark relating to its cost of producing ships relative to other shipyards. Benchmarking is a common technique in quality management because it gives managers a quantitative measure of how competitors are doing. Managers at Uljanik would use the benchmark Antic derived as a guide for further decisions. Managers instructed Antic to research a benchmark called ‘Cost per Compensated gross tons in U.S. dollars,’ and to obtain data for three other shipyards in Croatia.

### ULJANIK

Uljanik (pronounced OOL-yan-ick) is one of the largest shipyards in Croatia, a country on the eastern border of the Adriatic Sea. Croatia’s coastline, where mountains fall rapidly into the sea, creates many harbors that are deep as well as protected from tempestuous seas. Uljanik’s shipyard occupies half of the harbor in Pula, at the southern edge of the Istrian peninsula. The shipyard was founded in 1856 on a small island named Uljanik that was the location of numerous olive trees (‘ulika’ in Croatian means ‘olive’). At that time and until the end of the First World War, Istria was part of the Austro-Hungarian kingdom. Pula was the major port of the Austrian Navy, and Uljanik was the major naval shipyard in the kingdom. After the end of the Second World War, Uljanik became the major shipyard for Yugoslavia, producing commercial ships mainly for export. Yugoslavia broke apart in 1991 when Slovenia and Croatia declared that they would secede. Since then, Croatia has become one of numerous eastern European countries struggling to adapt to the modern world of market forces and reduced government control.

The majority owner of Uljanik is the government of Croatia. About 20 per cent of the shares are owned by private investors and former employees. Its revenues in 2002 were more than US\$160 million. The shipyard produces an average of five ships per year, the same number that were produced when Croatia was part of Yugoslavia. However, the shipyard today employs about 3,000 people compared to more than 8,000 15 years earlier, which means that productivity per employee has increased.

As in many companies in planned economies, executives at Uljanik have had to learn how to manage in a capitalist system. Managers in a planned economy tend to respond to direction from higher authorities such as government ministries rather than responding to market forces. This mind-set frequently leads to lack of innovation, hierarchical organization and lack of strategic planning.

Senior managers at Uljanik adopted the quality management system in an attempt to create a structure and processes in which the firm could respond more efficiently and effectively to customer requirements. Success of the quality effort and of increased productivity was indicated by the increase in Uljanik's sales to foreign customers from countries such as Norway, Sweden and Italy.

## **BENCHMARKS IN QUALITY MANAGEMENT**

Quality management has many synonyms, such as continuous improvement and quality assurance. Quality management is a customer-oriented system in which the organization produces to satisfy implicit and explicit customer requirements. Although there are nuances between each of the terms, all the concepts represent a method of directing an organization so that it achieves customer satisfaction, more efficient processes and improved performance. The management process involves several elements:

1. Setting objectives,
2. Establishing quantifiable targets representing the objectives,
3. Formulating a process to achieve the targets,
4. Measuring performance relative to the targets, and
5. Taking corrective actions and/or setting new targets.

Quality management does not prescribe the objectives, the targets, the process, the measures, nor the nature of the corrective actions. Those choices are left to managers of the organization. Because the environment and the needs of customers change constantly, the elements must be adaptable so they can change to reflect the new environment or revised customer needs. Managers must think not only in terms of what they are doing but also in terms of how they are doing it; both aspects affect organizational performance.

Benchmarking becomes part of the continuous improvement process in steps 2 and 4. A benchmark is an indicator that represents a best practice or performance. Typically, a company benchmarks a practice that it considers to be world-class, then tries to improve its performance relative to the benchmark. Identifying key performance indicators and measuring trends in the indicators relative to benchmarks are crucial elements of quality management.

## **SHIPBUILDING TERMINOLOGY**

The manufacturing facility in which a ship is built is called a shipyard, which Antic knew from growing up in Pula near Uljanik's headquarters. Shipbuilding worldwide was a US\$30 billion industry in 1999. One of the first things Antic learned was that comparing one shipyard to another is not easy. Because of the

variety of ships and variety of processes used in building and outfitting ships, it was difficult to compare directly the costs and productivities of different shipyards. One shipyard might specialize in ships of standard sizes and features, using techniques almost like an assembly line. Another yard might specialize in non-standard ships or ships with special features, requiring a large number of man-hours spent on intricate assembly. (A man-hour is one person working one hour.) Comparing productivity using a simple ratio such as man-hours per ton for the finished ship would not take into account the complexity of the production process.

To overcome this problem and to help measure productivity globally, members of the Organization for Economic Cooperation and Development (OECD) developed a series of compensation coefficients. The OECD generates a coefficient for each type of ship, then each shipyard adjusts the tonnage of ships it produces by its compensation coefficient. The result, 'compensated gross tons' (CGT), serves as the denominator in the productivity ratio: 'man-hours per compensated gross ton.' More efficient shipyards will use fewer man-hours per CGT, regardless of the type of ship being produced. Although compensated gross tons is not a precise measure for comparing productivity, it is accepted globally, so is an acceptable benchmark.

Antic's data showed that Uljanik produced more compensated gross tons in 2003 than any of the three yards management chose to benchmark (see Exhibit 1). On the other hand, the number of man-hours Uljanik used each year put it around the average for the three yards.

Antic also discovered that there is a difference in wage rates between shipyards due to the type of labor used in manufacturing. Yards producing specialized ships need workers with more sophisticated skill sets from yards producing standardized ships, so their wage rates are higher. Uljanik's cost per man-hour ranked near the middle of the four yards (see Exhibit 1). Antic wondered how Shipyard 3 could overcome the 10 per cent higher wages it paid.

Croatia's currency, the kuna (HRK), trades around 6.2 to the U.S. dollar. Because Uljanik prices its ships in dollars, Antic would need to adjust costs in kunas into their dollar equivalents so revenues and expenses would be in the same currency.

## THE TASK

With all this information running through his mind, Antic realized that it was time he developed a logical approach to organizing the data into a format that would help him calculate the benchmark. He also thought the format might help managers understand the variables on which they could base a decision. He decided to start with his ultimate objective — 'cost per CGT (US\$)' — and ask himself, "What do I need to know to calculate this result?" After identifying those elements, he would ask himself the same question as he progressed through each variable. He figured that, ultimately, he would end with the data he had researched. As Antic considered each variable, he would write it down and draw arrows showing how variables related to each other. Then he could create a spreadsheet model on his computer that would do the calculations for each of the shipyards.

## REFERENCES

Baldrige National Quality Program, [www.quality.nist.gov/](http://www.quality.nist.gov/), retrieved 20 April 2004.

Economic Study of Canada's Marine and Ocean Industries, [http://route.nrc-cnrc.gc.ca/ocean/economicstudy2001/1\\_e.cfm](http://route.nrc-cnrc.gc.ca/ocean/economicstudy2001/1_e.cfm), retrieved 23 April 2004.

Uljanik, [www.uljanik.hr/](http://www.uljanik.hr/), retrieved 20 April 2004.

## Exhibit 1

**SELECTED INDICATORS FOR ULJANIK AND THREE OTHER SHIPYARDS  
2003**

	<b>Uljanik</b>	<b>Shipyard 2</b>	<b>Shipyard 3</b>	<b>Shipyard 4</b>
Compensated gross tons	100,450	56,080	88,950	37,470
Total man-hours	2,961,304	3,793,610	4,656,524	1,640,781
Cost per man-hour (HRK)	104	97	117	105