

How Six Sigma transformed HSBC's US Futures business

In a business environment where many questioned the applicability of Six Sigma, the Quality team at HSBC transformed an under-performing unit in HSBC's Investment Banking unit with a single DMAIC project, using Six Sigma tools such as Process Mapping and Activity Based Costing and data partitioning. The result: a 274% improvement in net income and a business 100% focused on continuous improvement. This article chronicles their journey.

Situation analysis: A business undergoing massive change

The story starts with Karl Fruecht, Managing Director and Head of U.S. Futures at HSBC Securities (USA) Inc. Karl was responsible for a business that generated over \$30 million in revenue in 2002 yet was only marginally profitable.

The Futures business was a most unlikely candidate for a Six Sigma project given the trading floor culture and the shortage of success stories regarding Six Sigma at Investment Banks, however Karl was not afraid to look at his business differently, and wondered whether Six Sigma could be used to help the Futures business achieve its goals.



Karl Fruecht, Managing Director & Head of US Futures

Karl was managing his business through a period of unprecedented change. Most Futures markets around the world had already shut down their "open outcry" trading floors in favor of electronic trading platforms, however the US Futures exchanges were resisting these changes. This presented the difficult problem of having to sustain two platforms – a

support infrastructure to execute trades via the open outcry trading floors of the Chicago Mercantile Exchange and the Chicago Board of Trade, and the need to prepare to compete in a world dominated by electronic exchanges. Costs were rising to support two platforms as revenues per contract were falling due to the inevitable pricing pressure created by more efficient electronic trading systems.

For professionals in the US Futures industry, these are difficult times as many face the reality that they may one day need to reinvent their careers when the proverbial "lights go out" at the Chicago exchange floors. The challenge Karl faced was considerable – how do you motivate and mobilize a team to fix problems when the future looks so bleak?



Realizing that Six Sigma's team-based approach to problem solving could help him fix some problems while improving morale, Karl called the Six Sigma Quality team for help.

Project Charter: Focus on improving the cost / income ratio

While the potential of the Six Sigma approach was apparent, the problem to be attacked was not. The HSBC Quality Team, led by Dan Stusnick, a Certified Black Belt, interviewed and surveyed staff in New York and Chicago to identify problems that could be the focal point of improvement projects.

The surveying process identified numerous issues worth exploring, but none seemed to have the potential to dramatically impact bottom-line performance. In a bold move, Karl decided to focus on a single project goal – **to significantly improve the bottom line performance of the US Futures Business.**

By chartering a project focused on a cost / income metric, Karl committed his business to a broad Quality Initiative with a mandate to look at all the

factors contributing to bottom line performance. Karl opened the door to a full assessment of the business during the Define, Measure and Analyze phases of the project that would broadly explore opportunities to reduce costs while improving revenue.

During the early stages of the project, now titled "The Futures Quality Initiative", Dan Stusnick led the core team on an assessment of core processes using SIPOC and process mapping to understand the activities that went into servicing a customer and ultimately executing and clearing a Futures transaction.

While mapping the core process helped identify non-value added activities, process mapping alone was not enough – the team needed to understand the cost drivers of the services, and how the services were consumed by customers in order to understand the nature of the profitability problem.

Activity-Based Costing shines the light on cost drivers during Measure and Analyze

Activity-Based Costing ("ABC") had been used at HSBC before to highlight the cost of poor quality. In the Futures project, it served as the key innovation factor to understand what factors were influencing the process output, which in this case was Net Income.

During Measure, the process maps were used to operationally define activities. All Futures staff were surveyed to determine how much time was being spent on each activity. Ultimately, services such as research, trade idea generation and trade execution were costed based upon the cost of individuals doing the activities, and the time they spent doing them.

Transactional volume data was analyzed to determine processing cost per transaction. The assessment highlighted a number of business issues that significantly impacted net income. For example, the cost of processing a ticket manually via the open outcry pits was about \$8.00 regardless of the number of contracts on the ticket¹. By

¹ In the Futures and commodities markets, commissions are charged by contract, not per order. For example, an order for 5 S&P Futures contracts would generate a commission of \$5.00, assuming a standard \$1.00 per contract rate. An order for 100 S&Ps would generate \$100.00 commission, but would be processed just the same as the order for 5 contracts.

comparison, electronic execution cost about \$2.50 per ticket to process.

The ABC analysis also pointed out that ticket corrections on the electronic system (orders booked to incorrect accounts) accounted for about 33% of the total cost of supporting the electronic platform. Aside from being a "non-value added" activity by definition, without resolving the account correction problem, the vision of STP and fast, low cost electronic processing would never be realized.

The ABC data helped the team understand the differences in cost between the two operating platforms. The electronic platform had theoretically unlimited capacity, however insufficient volume was being driven through the machines to drive down marginal cost and generate a profit. Open outcry execution still accounted for the lion's share of volume, however it was increasingly difficult to turn a profit when commissions were being driven down.

With the global shift towards electronic trading, the Futures business model had changed dramatically over a few short years. In the past, commissions were high enough that the salesman's mantra that "all business was good business" held true. The growing acceptance of efficient electronic execution was now impacting the commission rates that could be charged for open outcry, and the result was rapidly dwindling margins. The upshot: the innovative use of ABC led to the team beginning to question whether we had the right types of customers given the way the business was structured.

Y=f(x)

The differences in the operating platforms highlighted the issue of capacity. In the open outcry paradigm, capacity can be expressed as:

$$\text{Capacity} = (\text{the number of traders on the floor}) * (\text{the amount of time available to execute trades}).$$

In the open outcry model, our process output (Net Income) is a function of capacity, trade volume, contract pricing and overhead. Given the inherent limitations of human capacity, it was apparent that customers that trade in small amounts via the pits were absorbing capacity and limiting their ability to grow more profitable customer business.

In the electronic model, capacity is far less of a constraint, realistically only limited by the speed and capacity of the servers used to run the systems. Our issues regarding the electronic platform were

the under-utilization of capacity, as well manual intervention in the form of ticket corrections.

The problem is clear when customers who pay a dollar or less per contract are executing trades via open outcry where the cost of processing a ticket was \$8.00. Customers who routinely placed orders for less than 10 contracts were consuming our capacity and generating unsatisfactory returns, before considering other costs such as research, marketing, etc.

In order to optimize our output (net income), it was now apparent that we needed improve our use of existing capacity. As a first step, it was necessary to understand how our existing customer base performed on a net income basis, after considering how transactional and servicing costs were consumed.

Using the ABC data, the team was able to evaluate net income by customer – another innovation that had never been done by the business before. The recursive partitioning capabilities of JMP were used to quickly identify breakeven points in contracts per order when considering variables such as maintenance level (High, Medium or Low) and platform (Pit vs. Electronic).

A 12-block tiering model was constructed to evaluate customer profitability against the level of service provided.

		Revenue after transaction processing costs											
		Bottom Quartile			75% Quartile			90% Quartile			Top Quartile		
Maintenance	Tier	Tier 1	Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Tier 8	Tier 9	Tier 10	Tier 11	Tier 12
		High	Red	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green
Medium	Red	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Low	Yellow	Yellow	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green

Customers in the Red zone were in the bottom 50% in terms of net income, and were “High” or “Medium” in terms of service provided. In our tiering model, these customers were unprofitable to service as they consumed more in resources than they generated in revenue. The model illustrated the need to either “uptier” red zone customers by renegotiating pricing or changing the servicing levels, or begin exiting red zone customers in favor of customers that had the potential to become green zone customers.

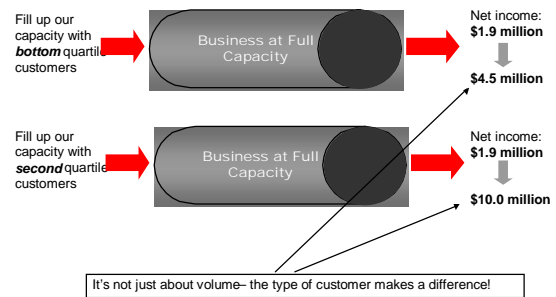
The tiering model forced the business to look at the cost of servicing customers, including research, marketing, “hand holding” to be able to assign costs to customers methodically and in a way that showed the true cost of servicing (cost to process transactions + cost to service). “High Maintenance” customers attracted proportionally higher costs. If the costs were not offset by higher revenues, the customer fell into the red or yellow tiers, meaning that they were likely to be unprofitable based upon the way we served them.

The tiering model also made it clear that customers that fell into the red tiers were consuming more in resources than they were generating in revenues. To continue to serve these customers, the business needed a plan to “uptier” the customer, either by revisiting pricing or changing the way we served the customer.

Given that the Futures Sales business is still commission-driven, Sales had to be convinced that not every dollar of business was good business – filling your day with small ticket trades will eventually limit your ability to grow value-added relationships.

In order to illustrate the point to Sales, we used the analogy of a pipe. Filling our pipe (our capacity to do business) with bottom quartile customers limits our ability to grow net income. The best way to grow net income was to make better use of our capacity by focusing more resources on the “right” types of customers.

Filling our capacity with bottom quartile customers will not be a material difference in terms of net



The question posed to the team: How do we identify the “right” customers for our business? The solution to this and other issues was formulated during the Improve Phase.

Solution: Improve Phase

The Analyze Phase left us with a list of issues that influenced capacity to varying degrees, not the least of which was the need to refocus Sales efforts on the right types of customers. Other problems that had a significant impact on net income were also identified, including:

- Market losses on trading errors (usually miscommunicated orders) amounted to \$765,000 in 2002, or about 40% of net income.
- Past due accounts receivable were growing, and consuming a growing amount of back office time to resolve.
- Research services, including a live “Squawk Box” narrative from the floor of the CBOT cost over \$1 million, yet it was unclear if we were receiving adequate revenues from the customers who required the service.
- Electronic order corrections – over \$400,000 in effort wasted to correct orders each year.
- Other issues were identified as productivity issues, such as the need to optimizing shift coverage of the 24-hour desk, and the need to reduce time spent on Administrative activities.

All of the issues identified were valid x’s, and could ultimately be traced to our process Y (net income). The challenge was how to attack the multiple problems that were contributing to the poor performance of the business.

As previously noted, the Champion (Karl) was initially attracted to the team-based approach of Six Sigma. Karl saw the opportunity to get his best people involved in solving problems as a great way to empower his team and improve morale. To launch the Improve Phase, a core team of senior staffers was gathered for a two-day offsite session to divide up the tasks and to develop a plan for execution.

Each member of the core team took responsibility for a mini-project using HSBC’s Rapid Improvement Process © Method (also known as “RIP”). RIP projects were prioritized using a project selection matrix in order to focus efforts on projects that could have the biggest impact on net income.

The most significant project revolved around the question of “how to identify the right customers for our business”. This was addressed by way of the creation of the Pricing / Servicing Model.

Using the ABC data, we built a screening tool in Excel that allows a salesperson to predict where the customer will fall in our tiering matrix based upon some basic profile questions, such as estimated volume, how the customer expects to be serviced, etc.



ABC Bank

Coverage Intensity (Check ONE)

- High priority sales coverage (i.e. 10 outgoing calls per customer order on average)
- Proactive sales coverage - daily contact from the HSBC team if required. Generally less than 10 outgoing calls per customer order
- Routine Sales coverage only. No outgoing calls under normal circumstances

Trading Style (Check all that apply)

- Requires multiple market coverage (i.e. overseas markets)
- Requires multiple product coverage
- Trades liquid markets
- Customer frequently issues OTC orders
- Extended execution quoting and/or pricing, discretionary orders, negative pricing requests
- Does / Aids Trading
- Places orders electronically via this client

Sales Coverage Approach (Check all that apply)

- Requires dedicated salesperson coverage (as opposed to team approach)
- Direct floor access to the CME and/or CBOT
- Requires direct phone lines
- All orders routed through 24-hour desk
- No direct coverage - customer deals electronically via this client

Information Requirements (Check all that apply)

- Customer expects us to relay trading floor activity during the day
- Customer frequently asks to be contacted when price moves (i.e. leaves call levels) or when something happens
- Manual position checks - customer expects us to manually track positions and update them throughout the day
- Opening Call - customer wants market commentary from the floor at the open

Research (Check all that apply)

- Custom Trade Ideas - we provide trade ideas tailored to the customer's needs
- Access to generic, custom research papers, daily reports, trade ideas etc.
- Access to all HSBC research and economics via e-mail, Bloomberg, website, etc.
- Access to CIBC equities for future service to be offered
- Special Projects - access to HSBC for analysis of specific market scenarios, quantitative analysis, etc.

Marketing (Check all that apply)

- No more than one face to face meeting per year, no entertainment
- Infrequent, possibly unscheduled meetings on an irregular basis
- Frequent face to face meetings. At least two customer visits per year
- Entertainment - customer expects to be invited to events at least once a year
- Customer travel required to visit customer

Service Level: **Low**

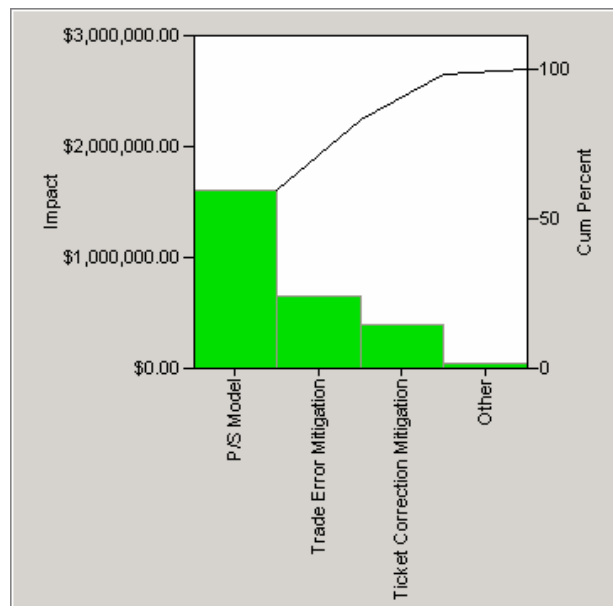
Using a “ala carte” menu of services, we can estimate the cost of servicing a customer, which then can be used to determine appropriate pricing. The model provides a way to screen out customers that we should avoid and provides an indicative minimum commission for new customers, but doesn’t address the existing customer base.

In another bold move, Karl decided to cease doing business with the bottom 50% of existing customers in order to free up capacity to chase top-tier customers. While sacrificing some revenue initially, this approach has been very successful over the course of the past year. The Futures business more than doubled net income over the period, and a large percentage of the gains coming from the new sales strategy – accomplished while reducing Sales headcount by 10%. Furthermore, the bottoms 25% of customers are now regularly reviewed, thus instilling continuous improvement into the sales management process.

Trade Error Reduction was also a significant win for the team. When the project started, market losses on trading errors reached \$765,000, which directly reduced net income. The Trade Error Team reviewed 12 months of error data, and used a pareto to focus in on the causes that had the biggest impact in terms of dollar losses. The team addressed the problems by revising procedures,

training sales staff, and through the implementation of monthly review meetings that analyze the cause of trade errors, and identify ways to mitigate them. The impact of this project can be measured in a reduction in market losses of approximately \$600,000.

Ticket Error Reduction also had a significant impact on productivity. The Ticket Error Team focused on the causes of electronic ticket corrections, and implemented changes in procedures that reduced the rate of corrections by more than 50%. While the problem has not gone away completely, the Operations team that manages the corrections has been able to cope with a tripling of electronic transaction volume without the need to add staff. Additional improvements are underway that will eliminate the most significant cause of the problem.



Results:

Ultimately, projects must show results, and the Futures Quality Initiative is no exception. When the project started, Net income stood at \$1.9 million, and had been more or less unchanged for several years. Furthermore, the business was in jeopardy due to the changing dynamics of the markets as electronic trading became a factor. As a result of the project:

- Net income climbed to an all time high of \$3.1 million during 2003 as many of the improvements were being implemented.
- For 2004, Futures net income is projected to climb to \$7.1 million, a 274% increase since the project began.
- Project results were achieved with a 10% reduction in headcount and in a declining commission environment.
- While not measured, the improvement in morale was noticeable. After the execution of the Improve Phase projects, the transformation of the Futures business was apparent. The entire business had been mobilized to address problems that had a direct impact on net income, and each of the core team have gone the extra step of achieving Green Belt Certification.

Conclusion:

The Futures Quality Initiative was innovative for several reasons:

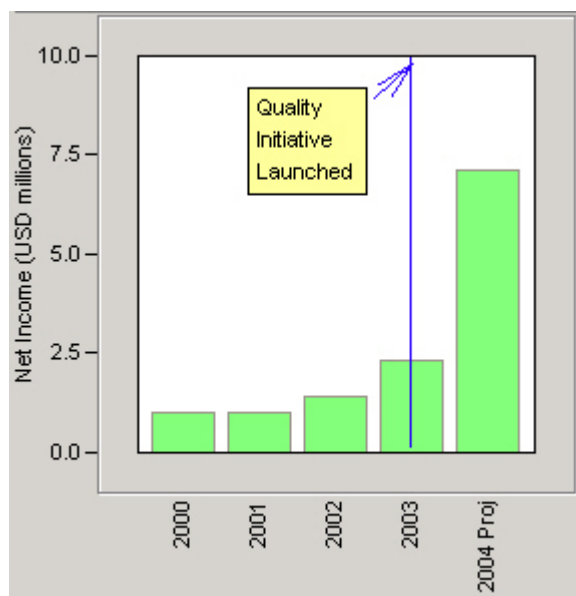
- With the help of a committed Champion, it proved that the Six Sigma toolkit is relevant in an Investment Banking and Capital Markets Trading environment
- It showed how DMAIC could be applied broadly as a business assessment tool and a vehicle to implement rapid changes that directly impact bottom-line income.
- It showed how ABC analysis can help a business focus efforts on developing the right customers. Where capacity is limited, it must be channeled to the right types of customers – not all business was good business!
- It involved everyone in efforts to optimize capacity, and significantly improved morale.

Commenting on what sets the Futures project apart from others in terms of innovation, Master Black Belt Jon Theuerkauf offered the following: *“the use of ABC results to build screening tools based on cost drivers and the use of the tool to focus the business on the right customers at the right price sets this project apart. This approach is seldom seen, particularly in investment banking businesses.”*

Champion Karl Fruecht added *“the Futures project united my team in the common cause of fixing the problems that were impeding the profitability of our business. The success of this project has revived*

morale, and has proven to senior management that not only is the Six Sigma approach relevant in a commodity markets business, it can help a business deliver compelling returns in a difficult market environment”.

Growth in Net Income 2000 – 2004



Jon Theuerkauf, Head of Best Practice, Global Transaction Banking and Certified Master Black Belt, contributed to the launch of the project and provided invaluable guidance and advice throughout the project.

The management team at HSBC Futures including **Frank Morgan, Jim Etkorn, Ralph Mauro, Pete Hutchison, Joe Sagil, Bob Streit, Julian Radford, Demetrious Evans, Lisa Jackson and Terry O’Neill** all managed individual RIP projects, and were key to the success of the Quality Initiative.

Attachment:

Storyboards from Futures Quality Initiative attached as Powerpoint slides:



Microsoft PowerPoint Presentation

Acknowledgements:

The U.S. Futures Quality Initiative was managed by **Dan Stusnick**, Senior Vice President and Certified Black Belt. Dan is currently responsible for the deployment of Six Sigma in HSBC’s Transaction Banking Businesses in North America. Prior to becoming a Black Belt, Dan was Business Manager for Global Fixed Income, and held various positions in Client Management, Business Development and Credit at HSBC since joining the Group in 1992.



Prior to joining HSBC, Dan worked as a Financial Analyst with Donaldson, Lufkin & Jenrette, Security Pacific Merchant Bank and Smith Barney. Dan holds a B.S. degree in Finance and Marketing from Fordham University.