Technology brings choice to MBA students

Professors at Wharton find fairer way to allocate courses by transferring workload to computers

Della Bradshaw NOVEMBER 23 2014

There can be few things more frustrating than investing $100,000 on an MBA degree, only to discover that the class you wanted to take on social media marketing is full, and you have been slotted into the class on advanced accounting instead.

Yet similar problems are faced by MBA students every year because of the sheer complexity of matching student preferences with increased course choice, a process often done through a course auction.

Professors at Wharton now believe they have come up with a better process than the current auction system for allocating MBA courses, as it gives a fairer distribution of electives while being less stressful and time-consuming for students. What is more, the algorithms behind Course Match could have a life outside business school, in allocating complex shift patterns in large hospital groups, for example.

Why is the present auction system flawed?

The idea behind the auction was to allocate seats like a share issue, explains Gerard Cachon, Professor of Operations and Information Management at Wharton, and the professor who has spearheaded the Course Match initiative. Four to five years ago professors realised that "it wasn't working the way we had intended it." Some people were doing really well - former financial traders were particularly adept at gaming the auction system - while others were getting inferior schedules. "We realised there might be something wrong with the mechanism itself."

Why Course Match?

The aims were to make the allocation system fairer and less onerous by transferring the workload from students to computers. The old eight-round auction system at Wharton was incredibly stressful, forcing students to predict the bidding strategies of their peers, says Prof Cachon. With Course Match there is just one round of bidding, but then 10 high-powered servers take 12 hours to run the algorithms and allocate courses.

There are a staggering number of possible permutations. With between 300 and 400 courses on the Wharton MBA, 1,700 students and 500 different prices that each course can command, "the number of price combinations is greater than the number of atoms in the universe," says Prof Cachon

How was it developed and how does it work?

Course Match was two years in development and based on theoretical research carried out by Chicago Booth professor Eric Budish on multi-unit assignments problems when he was a doctoral student at Harvard Business School.

With Course Match students allocate 100 points to their preferred course and then give points to other courses in proportion. They can link courses together, so if they wanted to study real estate development and real estate financing, they could bid additional points to get both programmes. Alternatively, might bid for two internet marketing courses, but only want one of them, so if one is allocated, they can instruct the algorithm to ignore the second. "You can say I want this OR this," says Prof Cachon. "Every student gets the best schedule they can afford."

With the agreement of students themselves, second year MBA students are allocated 5,000 bidding, and first year students just 4,000, to try and ensure that all MBAs cover the courses they want during their two years.

However, those who bid for less popular courses - those which carry a low tariff - are not allowed to carry unused points over to the next semester. If there are just 60 students in a class with 75 seats, the cost of the course would be zero, but it might be the course those students really want, points out Prof Cachon. "Why would we give them an advantage going into the next semester"

What have been the difficulties?

Right now the cost of computing is trivial. The big cost, in money and time, is designing the code.

What has been the student response?

Course Match was first used just over a year ago and the student response has been "overwhelmingly positive," says Prof Cachon. They believe the allocation is fair, and the process easy to use.

What happens next?

The allocation system is only being used for the MBA programme, but Cachon believes the most logical next step would be to extend the scheduling tool to Wharton's undergraduate degree and then to the University of Pennsylvania more generally. Other universities and even businesses could then adopt the system.

"We're a business school," says Prof Cachon. "We're always looking for revenue-generating opportunities."