



BY DON TALEND

The Calculation Factory

The first goal in the “Vision 2030: A Vision for the U.S. Concrete Industry” document from the industry’s Strategic Development Council (SDC) reveals how much the industry will depend on technology to improve service in the years to come: “The industry will make processing improvements throughout the life cycle of concrete, including design, manufacturing, [and] transportation ...”

Information systems providers are

▶ Information systems present the next frontier in customer service: optimization.

starting to drive fundamental changes in customer service by optimizing major business processes. Although optimization means different things to different providers, the common concept is that, in the future, information systems will present the concrete producer with operational improvement scenarios in various situations by making prolific calculations at lightning speed.

In the short term, the impact of optimization will be felt primarily in two core business processes: dispatching and mix design. In dispatching, this means that systems will recommend the “best” truck to send to a customer at any given time. In terms of mix design, it means minimizing cost or poor concrete performance, or maximizing good concrete performance.

If they haven’t already put an optimization product on the market, several providers are formulating product-development strategies.

Command Alkon, Birmingham, Ala., is looking at optimizing both of these processes. At ConExpo-Con/Agg last March, Ken Gendrich, director of

product research for Command Alkon, provided an overview of the impact that optimization will have on the industry.

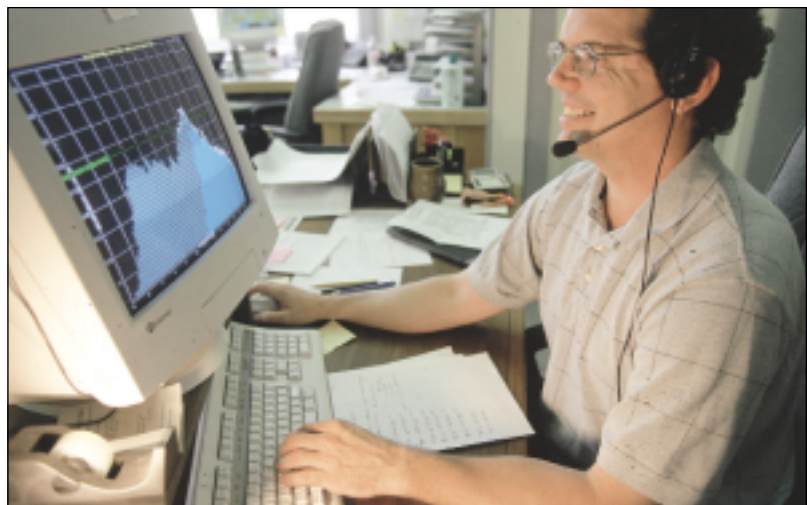
A job might have a truck requirement such as front discharge or a paving drum for discharging low-slump concrete for curb work. Or, at any given time, a truck that’s waiting on one job might have just the right mix for a contractor who’s waiting for concrete on another. With optimization systems, “Data will come in from all of the different plants, and the best plan will be computed and communicated to all of the decision makers, and they will choose the best plan,” said Gendrich.

Gendrich also sees Command Alkon forming alliances with other providers to optimize mixes. This will involve compiling test data that will

indicate the optimal aggregate gradation range or the most cost-effective cement content, for example. Command Alkon would serve as a central mix-design repository. Using historical data, the producer could tweak mix designs according to the properties of materials stored at different plants.

Jay Shilstone, a consultant with the Dallas-based Shilstone Companies, sees across-the-board mix-design optimization as a futuristic concept at this time. Shilstone, who offers software for aggregate and concrete statistical analysis as well as consulting services, sees logistical problems. With so many variables in physical aggregate properties—particularly particle shape and texture—among various sources, he says, compiling such data is a daunting task.

When true mix-design optimization emerges, though, it’ll systematize the industry’s move from prescriptive mix designs to performance-based quality control. “You wouldn’t be so concerned about the weight of material; for example, if the sand becomes finer, it’s actually going to produce a higher



Among other things, optimization means giving dispatchers effective truck-routing plans as conditions change by the minute.

water demand, and that's going to decrease strength," says Shilstone. "We envision that at some point, the weights of material will be changing for every batch and people won't care because they'll be able to monitor the resulting concrete mixture in terms of workability, strength, and time of set. So they'll get more uniform concrete in terms of performance, not in terms of the weight of materials."

Although the possibilities of this concept have not been fully realized yet, Shilstone and GivenHansco Inc., Ludlow, Mass., offer software with some optimization capabilities. GivenHansco's ConAd product has two modules that store data for powerful analysis. Production Manager can determine whether a given plant, truck, mix design, or other production variable is within tolerance and automatically alert a pager or cell phone of a problem. Mix Design offers tools such as Match Grading that allow the producer to design a mix using materials at one plant for the same workability as a mix from another plant.

"We can provide our customers' customers with the ability to show on-demand performance of mixes on each particular job," says GivenHansco's Gary Given. "All data are automatically crunched within the system, so the QC guy is not spending all of this time hand-keying in batch data results and test results; he's spending more time with customers out in the field."

Last but by no means least, Pittsburgh-based Digital Site Systems offers some powerful mix-design optimization tools in its Web-based Quadrel iService application. Using a Citrix Meta Frame client/server platform, the producer can track the performance of a given mix over multiple loads and from multiple plants. It's possible to compare various mixes using performance criteria drawn from stored data. It's also possible to track the proximity of test results to target strength—using ACI recommendations or field experience—

via color coding, even among different plants. This is particularly useful to large, multiple-plant companies.

In addition, the producer can design optimized mixes manually or automatically, the latter by incorporating aggregate gradation data or ACI recommendations (which the producer can adjust to local conditions and years of field experience).

Because customer interfaces present myriad scenarios more quickly than the human brain can process them, we need help from information systems. Whether we like it or not, those producers who can close this time gap using technology will thrive in the years ahead.