ANSYS® University Support Program

D. E. Dietrich, Ph.D.

Dr. Swanson was a firm believer in supporting engineering education and professional development. These areas were also important to sustaining his Swanson Analysis Systems, Inc. (SASI) business, engineering software sales and applications. He understood that it required skilled engineers to properly use engineering tools of which included computer programs like ANSYS.

A common theme throughout the history of the company under Dr. Swanson's tenure was his extraordinary vision and philanthropy. John continued to support projects in education and professional societies as he developed his business. In fact, he regularly directly participated in engineering technology training classes and professional society programs while Dr. Dietrich directed and managed those efforts later for the company.

The university support program really began by accident. Upon a request circa 1978 by one of John's alma maters, Dr. Swanson "gifted" a copy of the ANSYS software with the restriction that it could only be used for educational purposes. Other universities quickly heard of this "gifting" and contacted the company for similar copies. This became a topic in one of the bi-weekly SASI planning meetings. It was a hotly debated topic since there was a serious potential for misuse and even possible program piracy.

From the supporters, Dr. Dietrich was chosen and directed to produce a plan to address the requests. Dr. Kohnke also aided this effort as a strong supporter who offered many good suggestions. Dr. Swanson wanted a plan that could allow the company to support the universities, but protect the company's technology and product.

The ANSYS University Support Program was created from the ensuing proposed plan. The company created a new ANSYS license category with a modest fee ($1 US per year) and set coded problem size restrictions at a level that would allow meaningful student projects while limiting the potential misuse for commercial applications and consulting. It was also restricted to use on specific minicomputer platforms (at first just the Prime Computers) that were easier to secure and monitor. Free introductory training to faculty was offered if a class had openings. Dr. Dietrich was placed in charge of this new license program.

In the first year a handful of universities signed licenses. There was no advertising. It grew from professional word-of-mouth contacts. SASI had the first potential case of misuse within the first two years. We received hotline calls from graduate students from one university that was not on our licensing list. They received a copy from counterparts from another university since the students were working on a multi-school grant. The students were unaware of any licensing requirements and usage restrictions. To them they were simply sharing a resource. That is still a common problem in the university environment.

In fact, we found that the students from the licensed site quickly realized that copies of the program could be fairly easily made to run on many other minicomputers of the same model and operating system with a little effort. The unlicensed school had the same equipment so the licensed school just made a special copy for them. Obviously, our initial security was not very strong.

We had felt that we already addressed the key issues before we offered the software. We were surprised by how quickly the students found ways around our limited security. Many students are skilled and smart computer users. Anyone's security efforts are deemed to be personal challenges to some students with a lot of time on their hands. In this specific case these were students from one of the top technical schools in the world, not just the US. They were really good and were up to the challenge.

Our low license fee was set so that an individual professor could access the software for use in supporting classroom projects at even the advance undergraduate level without causing departmental financial problems. However, it created an unintentional consequence of possible lax oversight of student users since it sometimes was installed outside of the departmental computer use reviews.

We also did not have any specific, periodic reviews of the university use other than the yearly re-licensing process where a new license is signed and the $1 is paid. Most professors sent in notes about the use of the software. Some conveyed this by phone.

Of course the security was immediately modified and tightened. Dr. Dietrich canvassed a series of university engineering department heads to determine what level of licensing fee would automatically bring the software under a department's review. It was found that the fee had to be at least $50-$100 per year. That identified the next new license fee level. We stopped receiving individual requests from professors and now processed them from departments. A professor had to be identified and trained as the focal point of contact and support at the school. We then offered free introductory training credits to that professor. The problem size restrictions were maintained. Finally, to renew a license a university had to supply documentation describing the actual usage of the software (class projects, thesis support, etc.) We supplied a sample form with a possible format to follow. These documents were reviewed before any license was renewed. This minor tweaking of the rules brought the ANSYS usage within the scrutiny of at least the department level while still keeping the cost low. Departments were more apt to understand the concept of proprietary technology and property at that organization level.

SASI continued to use word-of-mouth marketing to keep control of the growth of licenses. There were only 200-300 universities in the US with accredited engineering programs, so it was commonly felt that the US market was limited. Within several more years nearly 75% of the accredited US schools had at least one licensed copy. Of course, other universities outside of the US soon became aware of the ANSYS University Support Program. The existing low fee was not high enough to get departmental review at these other non-US institutions. Also some US universities, and some outside the US, wanted to have the opportunity to do more challenging graduate research projects and funded research that included student participation.

The support program was then reviewed again to see if it was of benefit to all parties to expand the program and determine if the benefits outweighed the obvious risks. By this time the ANSYS Support Distributor (ASD) network was developing strength. Most supported the expansion and offered to add their support resources to the efforts. They fully understood the benefits. However, we were the ones that were at greatest risk.

It became inherently obvious to everyone that the overwhelming potential benefits outweighed the risks to all parties of the university support effort. We just had to establish better levels of security and control, expand the offering to more than just

minicomputer platforms (Prime, VAX, etc) to include workstations (Apollo, H-P, MicroVAX, etc.), provide more oversight, and create a tier of offerings that a university could use to expand their internal programs.

SASI kept the original software offering for universities that focused the applications on student classroom projects and thesis applications. The problem size limits were relaxed in the next levels of offering to support use in more challenging graduate level projects. The "ultimate" research license was established to support funded research that contained significant graduate student participation. Students had to receive class credit for their research efforts. The year-end report requirements became more detailed and we encouraged publication of the student/faculty project results. After the program was expanded we then decided to actually advertise the university support program. We highlighted some existing license success stories and gave faculty students access to publishing and presentations through the ANSYS Conferences. We even gave reduced fees for students and allowed them to act as session aides.

The new offerings included a new fee structure. The days of rampant inflation were just ending. A $50 per year fee was now within most faculty members individual spending authority. We needed fees that reflected the expanded options and met the levels requiring greater university internal oversight in most institutions. The base fee was set at $100. The expanded problem size fees were then set to something like $300 and $500 per year. Later these limited capacity fees then started at $300 and went up through $800. The research license fee was set at $1,000 per year. We still offered free introductory training to all initial licenses or changes in support faculty. We then required advanced training for faculty support of research licenses. Fees were usually waved for these advanced courses as well.

This new and improved ANSYS University Support Program just exploded on the "market". By the late 1980's SASI had 100% of the accredited US engineering schools covered with multiple licenses at each site. We numerically had even more schools than that covered internationally. The total number of actual university licenses increased to nearly 2,000. Over 50,000 students were then exposed to our software every year.

By then SASI set the base fee to $500 per year and expanded the entry-level program size limit. The universities were even forming informal support groups. The ASDs were working closely with many schools and providing extra monitoring.

At that same late 1980s timeframe SASI added the PC version of ANSYS to the university offerings and established site licensing for computer laboratories and other multiple computer installations. This actually kept the license count down for several years with site license consolidations. The total license numbers were only somewhere over 2,200 by 1993 since many older individual licenses were converted to site license coverage. However, the number of students supported jumped to over 100,000 per year. The year-end reports were used to closely monitor and track the effectiveness of the individual site work and the overall university program performance.

When Dr. Dietrich left the company in late 1994 the licenses were approaching 2,300 and the number of students reached was nearing 120,000 each year.

Over the growth period for the program there were many spin-off projects directed from the original university support program. Dr. Swanson supported a series of scholarships offerings for local high school students going into university technical programs. College students were offered highly paid summer internships through the university program. Faculty members were also offered summer internships. We offered selective graduate fellowship support. We joined co-operative education student programs with a series of universities and had co-op students on site every semester. We joined university advisory boards for engineering programs. Textbook development was also supported. We then started an external research support program that funded promising basic and applied research across all engineering disciplines. In under approximately five years we had $1,000,000 of external research support effort completed or in progress.

The ANSYS University Support Program had grown from a licensed "gift" program into a multi-million dollar business segment with worldwide educational impact. The original altruistic goals of the program were still being satisfied, but the effort had grown into a major marketing tool and profitable business segment. The ANSYS University Support Program became an industry-wide recognized project because of the vision and support of Dr. Swanson, the drive and management skills of Dr. Dietrich, and the overall corporate commitment to the engineering profession. All were committed to supporting engineering education and professional development.

After his "retirement" from ANSYS Inc. Dr. Swanson continued his personal contributions to engineering education and professional societies by making significant donations to establish laboratories and other research programs in universities, plus give major donations to engineering societies.

ANSYS/ED

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The ANSYS/ED personal computer based license program roots sprouted from the university support program around 1991-92. A possible student version of ANSYS was proposed as a logical progression in the university support program. With John's approval before he went on a well-deserved winter vacation, Dr. Dietrich formed a special project team that created a prototype "student version" of ANSYS on the personal computer platform. This was a phenomenal effort put forth by a skunk-works style group of 5-7 people "borrowed" from several groups. By the time John returned (about 4 weeks later) we had a working test version and a draft of a manual with fully annotated sample problems. The "package" was designed for mass marketing to students through bookstores and for individual orders. It was also directed towards individual engineers who could use it for the proverbial "simplified test case" projects to prove the effectiveness of a potential approach to managers without tying up current resources or asking for full licenses costing tens of thousands of dollars.

The ANSYS/ED software had all of the standard ANSYS software technical capabilities, but was specially limited in problem size capacity. It also had unique security features developed by the PC group that essentially destroyed and disabled the actual software if users tried to "misuse" or tamper with the program. The workbook manual had around twelve sample problems done in detail to level of describing menu picks. The sample problems covered all levels of ANSYS technical complexity using small models. This created great templates for larger problems using the same technology.

The actual cost of production of a unit for ANSYS/ED (including media, packaging, workbook, marketing materials, handling, and shipping) was kept exceptionally low (company proprietary number). The company and the ASDs could (and did) use copies for marketing purposes at minimal costs. It was even offered as part of the standard class materials in ANSYS training classes. The "manufacturer's suggested retail price", single unit price, was set at $150 for one copy and discounts were offered for levels of multiple copies. In fact, we offered significant bulk order discounts for the bookstores or anyone else with large orders. That put the potential single unit cost at or below the level of a good textbook. (That price still was a far cry higher than any textbook I ever purchased many years before that, but it was consistent with the early 1990's market.)

Several thousands of copies were sold in the first year. Many additional copies were used in training and marketing. The already highly profitable university support market segment income basically doubled in that one year. The profit margin went even higher. We even introduced some new business support methods to keep the costs down for the "higher" volume of product production and handling.

After John sold the company, the new owners (financial experts) and new CEO almost immediately wanted to double the ANSYS/ED price ($300 each) since they thought that would more than double the profit of that business segment. Of course they forgot the standard "price elasticity" issue for higher volume, lower cost products. Textbooks of $300 at that time were beyond most student and engineer budgets. I have heard that the volume then dropped significantly but the income stayed nearly constant. Of course that negated most of the marketing benefit of the software since fewer new users were introduced to the product or provided the chance for self-training. However, the recorded profit margin increased and the accountants were probably happy. The company is still offering ANSYS/ED.

University Support Postscripts

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An original goal of the ANSYS University Support Program was to augment traditional engineering technology education classes with computer simulation tools that allowed supplements to traditional closed form calculations. SASI engineers did not want this to replace teaching the fundamentals of mechanics, physics, applied mathematics, etc. The university support program was also designed to allow professors to develop more realistic advanced, undergraduate level, class projects.

The company's engineering staff members debated the negative potential for "commercializing" education. Most engineering departments just did not have access to engineering software with the quality, training materials, support levels, and capability found in commercial programs such as ANSYS. When the software was offered, it was primarily identified for a role as supportive to teaching the traditional fundamentals.

Most universities used (and still use) the software appropriately. They shared "success" stories across the university user domain. Support groups were established among collections of universities. This allowed schools to see what others were doing. They could update, augment, or correct their own applications as they saw fit. This created a potential for a "self correcting" mechanism in the support program.

In a short time the ANSYS University Support Program had proven its effectiveness in augmenting university engineering classes. It also became apparent to even the original skeptics and critics within our own organization that the support program was a great marketing tool even when used in a low visibility role. This type of marketing was under the normal "radar" of corporate types and educational purists. This type of approach later became known as a form of "gorilla marketing" (done at a lower levels and outside of traditional channels where it was difficult to contain). Soon tens of thousands of students were being hired into companies that did not use finite element (FE) technology. They pushed to bring the tools in as productivity enhancements. Other industries that were traditional FE users were also hiring FE trained students. They were pressured to get licenses for the software product they used at the schools. In both cases these new employees pushed to get the ANSYS program that was used in their universities. Dr. Kohnke once described this phenomenon as being fully comparable to companies offering a free or low cost products (soft drinks, shoes, laboratory machines, etc.) for student use and charging them or their employer standard rates and prices once they leave the university environment.

The university support program addressed some of the company's greatest limiting growth factors by:

1. Increasing the originally limited supply of the appropriately trained users,
2. Offering a continuous replacement channel of users, and
3. Expanding the scope of potential applications as universities extended projects into new fields.

It also moderated the potential for business cost increases in the areas of training, customer support, and technical marketing as the user base grew.