

Venturing Your Concept

Facility design 7

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Have you ever toured the factory of a small company and wondered how anything gets made in this place? No smooth process or assembly lines, shipping and receiving is right in the middle of everything, and the shop telephone is in a noisy place. Maybe one end of a hall is full of junk. Everything looks jury-rigged. Well just maybe you visited a start-up of the boot-strap variety.

In the early phase of venturing, our mission is to start manufacturing, cover direct costs as soon as possible, and begin the growth process. Early in the cycle, it is vital to get going, manufacturing product. Later, we can organize our facility for efficiency, improve quality, reduce costs, and optimize our system. Moreover, for a host of reasons, we may not be able to just create or move into a building designed to fit our needs. With no time to waste on a limited budget, we must make do, and do it fast.

If we have a feeling for the local area infrastructure (business support services) and talents needed, we are a long way toward accomplishing our goal. And if we are veterans of the turf, have an idea that has a market, have the drive to make it all happen, and some wherewithal, our facility will simply be the first step along our march toward a thriving business.

The following lists are exemplary, intended to stir your thinking toward the practical issues.

I will proceed on the assumptions that:

- our process has never been practiced commercially; our product is unique;
- we will boot-strap our operation to maximize eventual return;
- we must design a unique piece of equipment ourselves; all other items are off-the-shelf;
- our start-up team consists of at least three persons with varied skill-sets who are also the owner/operators;
- we will be renting space;
- we have a strong prospect for growth; and
- our process is defined in terms of input materials, finished product, floor and overhead space, energy, transportation, environmental impact, and labor needs.

The facility issues are basically dual in nature—location and design; each may affect the other. Location features include: labor markets, access to

communication and transportation, political and business climates, distance from home, weather, energy costs, municipal services (fire, police, ambulance, and waste handling), tax and insurance rates, facility parameters, state and local permits required, environmental regulations, and local services available.

Design is affected by several variables, but, for the start-up, the foremost question is: Is this facility sufficient for what we need to do at a price we can afford? So we select the first reasonable option that suffices.

We now know where square one will be. Most production facilities have four basic functions: 1) Entries for input materials and products, 2) manufacture of finished goods, 3) exits for effluent and shipments of goods, and 4) management modules which include all internal support functions. Items 2 and 4 usually require the most thought and planning.

Since our facility will be the first of its kind on earth, we have no choice but to learn as we go. The planning operation is critical; the plan is not. Plans can be no better than the planning process. If our planning is done well, we know how to meet the unexpected. The typical plan is quickly dated. In venturing, as in research, I have seen plan after plan become an albatross, impossible to complete. But there can be no substitute for knowing what we are doing today and what we likely will do tomorrow. Next week will take care of itself—until we learn to see around corners. Today, each day, is our focus—this is what matters most.

From our process flow sheet we know the components we must use for manufacturing and the sequence for their deployment. We know also about our building and how much weight can go here, how power is provided there, and why the effluent collection must be over yonder. Component suppliers are available everywhere. So also for raw materials, parts, fabrication houses, and other services. These are just a few of the direct issues with logical resolutions. Finally, relationships with the local and state regulation authorities must be established and fostered on a regular basis.

So how do we get up and running as soon as practical? Working hard, the obvious answer, is only one part of the solution. The other part is “working smart” with realistic time goals. This may seem obvious, but I have been victimized by overly optimistic target dates more than once. Target dates are typically designed to: 1) push people to higher performance, 2) schedule things in an orderly fashion, or 3) give the boss the sense of being in full control. But we, the founders, are the target-setters and target-achievers—the bosses and slaves at once. Since we must move as fast as possible, it makes little sense to take time out and plan everything to the n^{th} degree, then go out and do it “according to plan” complete with due dates. Rather, in my experience, we accomplish more without the bureaucratic trappings of drawing up a plan that will be valid only for a few days anyway. Entrepreneurs feel the urgency; no hype is needed. Plans

have a place in the world of efficiency, but early on we need to be effective with a different mindset, a mindset to deal with the unknown and get there first.

Perhaps an anecdote will be helpful here. The Alta Group (a company I co-founded) built a facility in 1985 to refine titanium. It employed electrolytic cells never before used commercially or outside the laboratory. We had to start from scratch. None of us had direct experience with the process. It was evident that the cells would be long-lead items. I went to work on the process design while my cohorts scouted locations. With our first location rented in three weeks, we established our first headquarters;

- designing long lead items first and putting them on order;
- finding the needed equipment suppliers and fabricators;
- consolidating funding;
- clearing things with the local authorities and landlord;
- contacting the power company for a transformer upgrade;
- beefing up the foundation to support the cells;
- poking a hole in the roof for ventilation;
- assembling equipment as it arrived;
- contracting out electrical and mechanical work covered by codes;
- designing and assembling supporting structures and reagent handling;
- testing each device and circuit as it arrived;
- calibrating the furnaces
- turning on power for the first time, and
- using hair dryers to dry our first several lots of crystal after rinsing!

All this and more happened in 80 days flat—from nothing to a producer of high purity electronic grade titanium. A tornado promptly shut us down for four days, but we still made a shipment 17 days later. Tough times were still to come, but we had our factory. In retrospect there was no looking back. The Alta Group became the world's leading supplier of electronic grade titanium in '86, and ready for the industry ramp-up in '88—after building a larger facility and surviving a downturn.

As for our methodology we:

- were able to do most of it ourselves, with our individual skills — no general contractor needed;
- had the right chemistry to achieve the E2E Drucker Transition. E2E means going from being effective to being efficient—from doing the right things (to get started) to doing them well later (to secure our market);
- were each experts and experienced in our own fields; we each led our own area of expertise but kept others advised and aware;
- encouraged cross talk (at one point a “dumb question” redirected our cell design);

- were each conscious of the need for speed;
- were each flexible in the jobs we did and wore many hats;
- were physically, mentally, and emotionally energetic;
- hired a marketing consultant in electronic materials to teach us how computer chips are fabricated and their market dynamics;
- tackled the toughest jobs first; so also for the long-lead designs;
- did everything in parallel — “nonlinear”; did what was possible each day;
- regularly reviewed progress; visited suppliers who fell behind;
- called on various customers, keeping them posted;
- bought second- or third-hand equipment, often at auction, saving 90-99 cents of every dollar budgeted for equipment;
- tested each component and assembly as we went along and made instant changes if indicated;
- used known solutions we knew would suffice;
- improvised where there were no ready solutions;
- enlisted help from family and friends; and
- tracked expenditures daily and reforecast the market regularly.

Our facility came on line with capacity to spare for the total world demand in the near term—only a couple of years as it turned out. To get ready for the market explosion of 1988, we bought a larger building and did it all over again.

With a week’s worth of inventory on hand, process improvement began. Our first refined metal harvest and cell turn-around took 12 hours. That was later reduced to two hours by systemizing procedures, improving component fit-up, beefing up mechanical and electrical equipment, taking unnecessary steps out of the process, and smoothing workflow and teamwork.

This facility was the first of its kind on earth, but its creation is representative of many issues facing any new start-up. My lists will differ for other ventures, of course. But they illustrate the diversity often needed to create a facility that will get you where you want to go as expeditiously as possible. Flexibility and teamwork are the great enablers.

In conclusion, and to summarize a bit, knowing our turf, our process, the local infrastructure, and our market will help us locate our facility, scope its size, and create the management structure needed to fit our operation. Doing what is possible each day and working as much as possible in parallel minimizes construction time. A flexible, can-do spirit, and zest for adventure are what it takes. But if you are not ready for latrine duty, forget it.

Now that we have our facility, it is time to think about staff selection—the single most important function for any entrepreneur. This will be my topic for next time.