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THE "SWISS PATTADA"

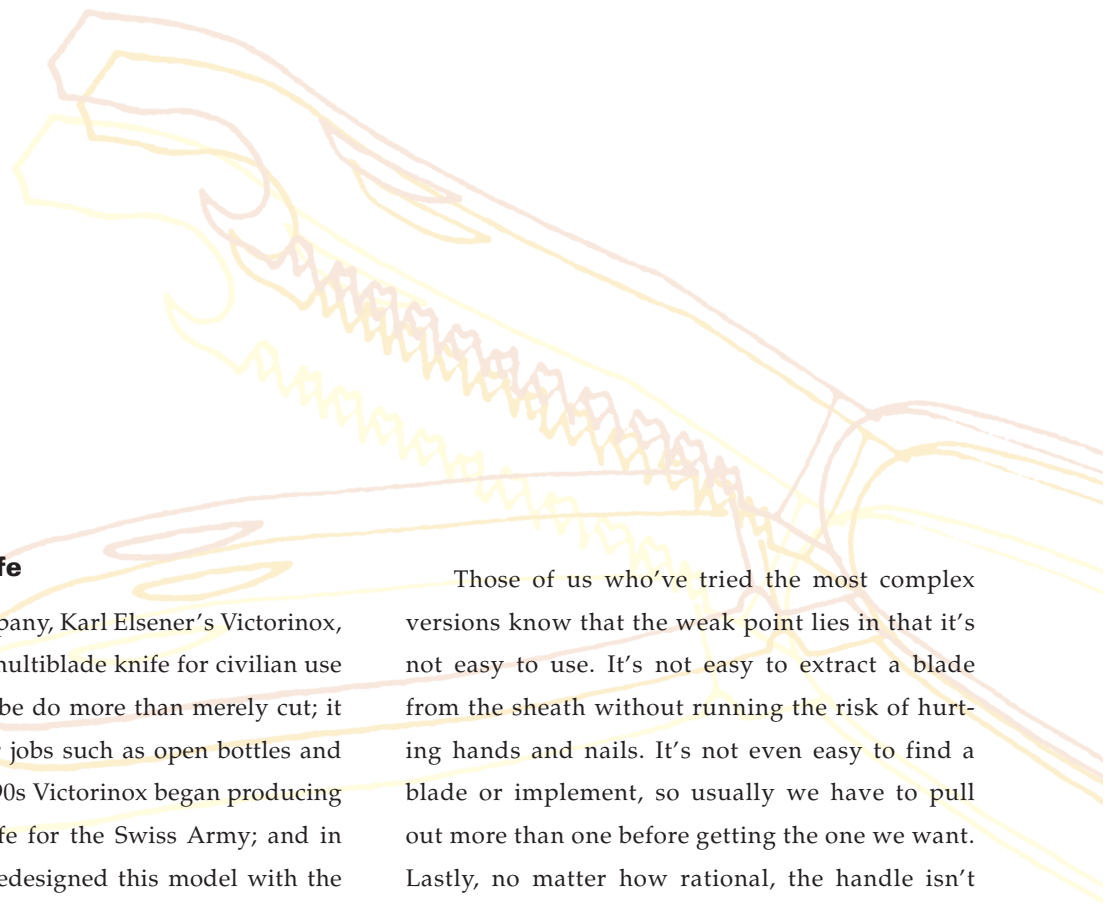
DESIGNING THE ULTIMATE TOOL

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Swiss Army Knife

In 1884 a Swiss company, Karl Elsener's Victorinox, began producing a multiblade knife for civilian use [4]. The tool had to be do more than merely cut; it also had to do other jobs such as open bottles and cans. In the early 1890s Victorinox began producing a variant of the knife for the Swiss Army; and in 1897 the company redesigned this model with the aim of making it lighter and smaller. At that point, in its many variants the knife became the one that today remains a best-seller worldwide. Along with an even smaller version made by Wenger, another Swiss company, this model gave rise to the enduring legend of the Swiss Army Knife. Today, the knife has become the paradigm of the universal tool (see, for example, [5], pp. 61-62) and ranges from simple five-function to complex 30-or-more-function knives.


Screwdrivers, punches, blades of various lengths, saws and files, magnifying glasses, compasses, scissors, pliers, corkscrews, bottle openers, and rulers are only some of the elements that turn the little red plastic holder into the handiest of jewel cases to pop out of the mythical pockets of Eta Beta (the mothball-eating Disney character who's a friend of Mickey Mouse).

Those of us who've tried the most complex versions know that the weak point lies in that it's not easy to use. It's not easy to extract a blade from the sheath without running the risk of hurting hands and nails. It's not even easy to find a blade or implement, so usually we have to pull out more than one before getting the one we want. Lastly, no matter how rational, the handle isn't ergonomically adequate for various jobs; as a result, doing well what we have to do often doesn't come easy [5, p. 61].

Sardinian Pattada

Another knife, this one an Italian pocketknife that dates back to the 15th century [1], is a folding model that opens to a length of 15 to 35 cm (not to be confused with the switchblade). Farmers and shepherds always carried it with them to do all sorts of jobs in the fields or simply to have on hand during long periods away from home. Versions vary depending on the area or region of Italy. Some come with single blades, others with double. The shape, material, and possible decoration of the blade changes from one part of the country to the next, as does the material of which the handle is made—usually fine wood or horn. Many of these knives are still manufactured by Coltellerie

The Swiss Army Knife and the Sardinian Pattada differ not in actual use but in the philosophy behind how they meet relative user needs.



Conaz, a Scarperia (Florence)-based company that preserves this tradition with masterliness and passion.

The Sardinian Pattada is available in a variety of sizes and features a sharp myrtle-leaf-shaped blade with a whetted point. The Pattada is suitable for all kinds of tasks, both on the job and in the home (slicing, forking, carving). It's not only a good means of self-defense, it is also used by shepherds for operating on cattle and for taking care of personal hygiene (shaving, clipping fingernails). Thanks to this universal tool, the shepherd can avoid traveling with a large number of cutting implements.

Although a two-sided bovine horn handle facilitates the Pattada's multiplicity of uses, the Pattada demands a particular skill in handling. An inexperienced person risks getting hurt with a knife like this, somewhat in the same way he would if—unaccustomed to doing so—he tried to shave with a barber's straight razor.

Introducing... the Swiss Pattada

The Swiss Army Knife and the Sardinian Pattada, although very different, meet similar needs. Both are multifunctional knives fine for performing a

great quantity of tasks. They differ not in actual use but in the philosophy behind how they meet relative user needs.

Because the Swiss Army Knife holds a blade or implement for each different function, the user must select the proper one for what he wants to do. In contrast, the Sardinian Pattada has a single, very sharp, pointed blade that a skilled person can use for various purposes.

Thus, the Swiss Army Knife is a tool rich in multiplicity and the Sardinian Pattada is rich in openness [3]. An object is multiple if it involves a collection of specialized parts, one for each of the jobs we want to do; it is open if it consists of a single component that we can use for various purposes in various instances. Multiplicity and openness make sense in complex situations in which monofunctional tools are too narrow and rigid. Multiplicity connects well with

specialization in that each function finds in it an ad hoc answer, whereas openness connects well with *universality* because the more an implement can be used for any task at all (including unforeseen ones), the more open it is.

Multiplicity favors the quality of each single function over ease of access to the function, and openness makes it easy to shift from one function to

Multiplicity and openness meet the same needs but in diverse ways.



the next at the cost of giving only an approximate answer to each. Thus multiplicity and openness meet the same needs but in diverse ways. We can consider each a different paradigm for dealing with complex situations.

And yet multiplicity and openness are not alternative paradigms. We would be very glad to have a tool offering the Swiss Army Knife's multiplicity and the Sardinian Pattada's openness. We could call it the Swiss Pattada. It should be a single-

However, a tool of this kind cannot exist; a blade must be firm and hard, which contrasts with the plasticity it should have in order to change form. Material objects can at most combine a little multiplicity with a little openness. In designing a multifunctional tool we can reduce to a minimum the number of diverse implements it contains, making each implement as open as possible. However, we must avoid having too many tools (and thus have a hard time finding the right one),

Computers have stretched the limits even further in their capacity for combining openness and multiplicity.

blade knife that, from case to case, assumes the optimal form for the job it must do. A tool of this type would combine the best features of both Swiss Army Knife and Sardinian Pattada, eliminating or significantly reducing the limitations of each. With it, every possible function would have its own special implement to make any job easy. Moreover, shifting from one function to the next would require no selection and extraction process but instead would occur automatically through a transformation of the tool at the moment the user decides to go on to a different task.

and we mustn't attribute too many functions to a single tool; otherwise, using it would become too difficult.

Multiplicity and Openness in ICT

The advent of automation has led to ever more powerful tools for creating objects that can approach the Swiss Pattada's imaginary serviceability. For example, today's washing machines have different cycles for washing different fabrics; the most sophisticated automobiles memorize different positions of the driver's seat for different

people; a single air conditioner can keep rooms either cool or warm and can even filter air.

Computers have stretched the limits even further in their capacity for combining openness and multiplicity. A personal computer boasts multiplicity when it has numerous applications allowing the user to perform lots of different tasks (write, balance accounts, prepare papers, make diagrams, memorize information and documents, send and receive e-mail messages, surf the Web). But it has great openness too, for it can connect online with other computers, even those using a different operating system, and with other devices such as compact disc readers, fax machines, printers, and scanners. It is even more open when its operating system lets the user use a single graphic or symbolic command (on the Macintosh: click once or twice on an icon or word, drag an icon onto another; hit pairs of keys like the apple and X, C, or V) in diverse contexts to trigger different and yet always intelligible effects.

Thanks to the current ability of several types of objects to convey information, we can modify relative configurations with simple commands and thus direct these objects to perform various functions. If this configuration is linked with different kinds of sensors, the objects become capable of automatically assuming the configuration necessary for performing a certain function when needed. Here is an example a majority of readers should be familiar with: On personal computers when we double-click on a file created with a particular



Swiss Army Knife



Sardinian Pattada

application the system opens both the file and the application. In recent years, moreover, it has become possible to create multimedia documents (consisting of text, figures, tables, and so on) in which the application rendering the segment on which the pointer is fixed is always open. In short, the most advanced editing systems are *open* systems that offer users *multiple* functions for creating, reading, and modifying the various parts of a multimedia document. Those of us who have been

We must also emphasize, however, that, as with objects in general (whether static, mechanical, or electronic), the evolution of computers themselves has not been uniform in achieving greater openness and multiplicity; in many cases development has concerned improvement of a single function, ignoring the question of its integration with multifunction systems. Professional programs such as computer-aided design, graphic design, and statistical elaboration programs have

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using personal computers for a number of years will surely recall how complex it was to create text with figures and tables in the past, when we could only paste figures or tables into the text but could not modify them. And readers who have been around the longest will remember how, before the widespread use of computers, various tools were used to create figures, tables, and text and how the person typing the text had to measure the precise amount of space for a figure or table. Thus we can interpret the evolution that the personal computer has triggered in tools for creating documents as a development in openness and multiplicity.

generally keyed into this logic of functional optimization, in which the single application is given preference over the development of an open and multiple system. We will not examine here why this orientation is so strong (although market competition and ambitions of program designers both apply). Nevertheless, today email programs remain separate from the ones we regularly use to do our jobs (programming tools, spreadsheets, graphic design programs, databases), and the graphic interface that personal computers offer users for managing their workspace (usually based on the metaphor of the electronic desktop)

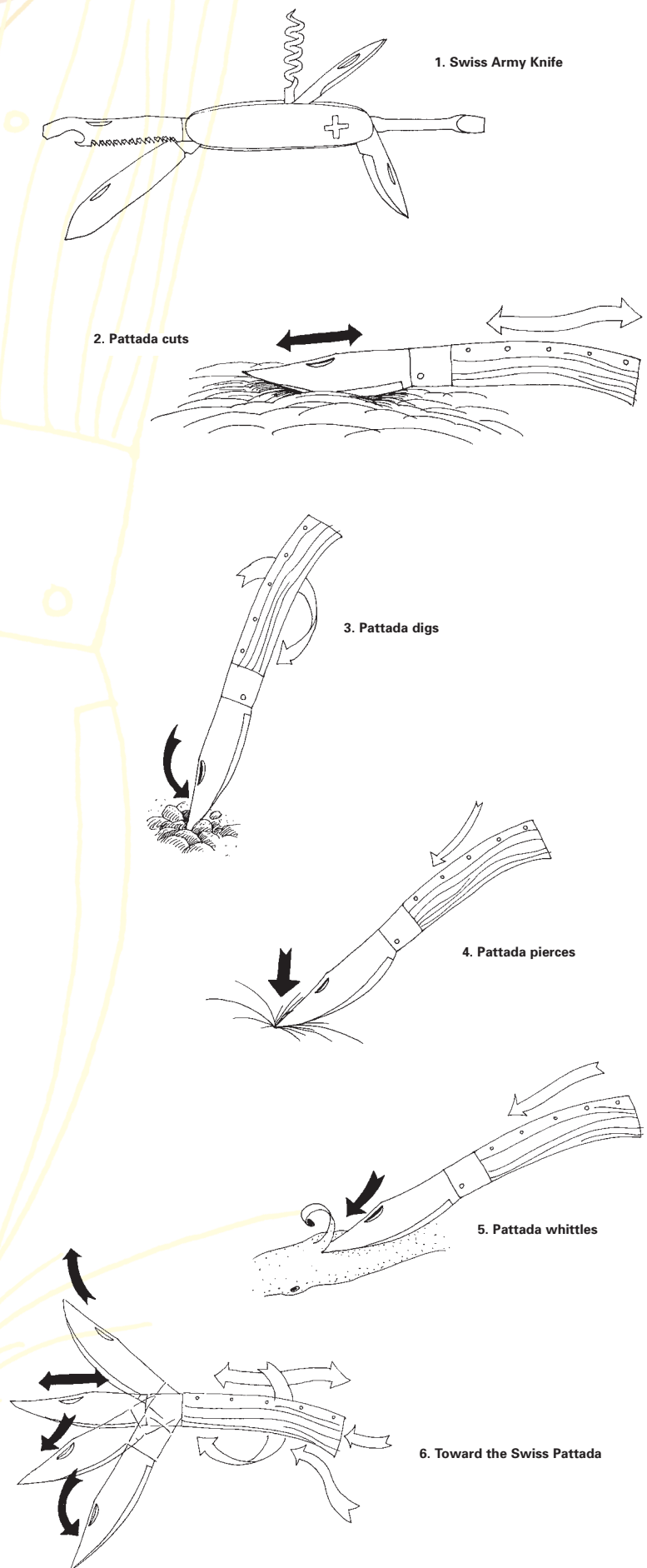
fails to consider the complexity of the context in which they do their work.

The Power of Continuity

So how far can we go with the Swiss Pattada? To answer this question we should consider the obstacles it poses, for only by fully understanding them will we be able to grasp how to avoid them. The problems of interest here are not contingent—such as the inadequacy of technology or human resistance to innovation—since these can be overcome in the mid-to-long term and shouldn't prevent the development of open and manifold systems.

We must be concerned with problems that can undermine the very likelihood of an object combining openness and multiplicity—one problem, in particular. Multiplicity and openness are two intrinsically contradictory attributes; multiplicity creates distinctions and thus boundaries between one function and another, whereas openness breaks down all borderlines to encompass all functions in one whole. To be open, an artifact must clearly forgo multiplicity. That is, it must diminish the differences between its various functions in order to make them seem at most, variants of a more general function that encompasses them all. Simultaneously, to be multiple it must highlight the differences between functions and relative implements, clearly separating one from the other.

So, are multimedia document editing programs fortunate isolated cases, or do they show the way to overcoming the contradiction between openness



and multiplicity? In my opinion, programs that are open and have multiplicity functions are neither fortuitous nor narrow: it comes from a dynamic use of openness to make multiplicity accessible. In fact, when we create a document with one of these programs, unless we indicate otherwise with a command, the position of the pointer on the file singling out the portion of the document we're working on lets the system select the application with which the file can be read or modified and makes it available to us. Thus the editing program can switch from one of its many functions to another, taking advantage of the fact that the personal computer's operating system is open and provides all applications with a single set of basic commands (for example, the *cut*, *copy*, *paste* commands).

In short, the various applications of an editing program have no continuity, so shifting from one application to another can be considered similar to any of the functions of those applications. And continuity is expressly the attribute that, in conjunction with multiplicity and openness, lets the last two coexist. A multimedia editing program contains all the functions that let us control text, tables, figures, and graphs, but these functions are united in applications that deal with only one of these types of documents. The combination of those applications in a single program ensures that the shifting between them requires no entering or exiting of the various applications but happens by means of an (apparently) continual transformation. A multimedia editing program is truly a Swiss Pattada that

gives its single blade (the current application) the suitable form for the function requested (the kind of document dealt with).

What allows an object to have continuity? As John Seely Brown and Paul Duguid [2] observed, the answer lies in the resources of its borders: An object continuity depends on how its individual applications communicate with one another and on how the object communicates with its users and with the situation in which it is used. If those borders are mere separators, then there is no continuity, and multiplicity and openness remain contradictory attributes. But if they are rich in resources that facilitate communication among various functions and applications, between object and user, between object and context of use, then those resources award it the continuity that lets it join multiplicity and openness.

Little attention has been paid to modes of use (dealt with up till now mainly in terms of tasks to perform). As a result, programs that feature openness, multiplicity, and continuity have been sporadic and informal. Still, information and communication technology has created the conditions for making the design of these program possible and pertinent.

The Swiss Pattada may remain just a dream in the material world. But if, as we hope, the interests and needs of users become the primary force for the design of programs based on information and communication technology, in technologically augmented reality we'll see the model of the Swiss Pattada ever more frequently used in the most varied of situations and forms.



ACKNOWLEDGMENTS

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ABOUT MARCO SUSANI'S DRAWINGS OF THE SWISS PATTADA

Marco Susani and I were discussing the Swiss Pattada as a metaphor for good design. Marco, a designer with a background in architecture and industrial design who directed the Domus Academy Research Center, establishing it as a primary design center in interaction design, is currently Director of the Advanced Concepts Group of Motorola Design in Boston, MA. He drew a series of illustrations to show a composite of the Pattada and the Swiss Army Knife, and combined into a single drawing the positions of Pattada to perform its many functions. Pattada appears as a new variant of the Swiss Army Knife—taking into account that moving from one position to another one (from one function to another) takes time and can be done through continual movement.

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