



Faculty Publications

2007-11-01

Template Use and the Effectiveness of Knowledge Transfer

Robert J. Jensen
robertjensen@byu.edu

Gabriel Szulanski

Follow this and additional works at: <https://scholarsarchive.byu.edu/facpub>



Part of the [Business Administration, Management, and Operations Commons](#)

Original Publication Citation

Jensen, R.J., Szulanski, G. 27. Template Use and the Effectiveness of Knowledge Transfer. *Management Science* 53 (11): 1716-173.

BYU ScholarsArchive Citation

Jensen, Robert J. and Szulanski, Gabriel, "Template Use and the Effectiveness of Knowledge Transfer" (2007). *Faculty Publications*. 226.
<https://scholarsarchive.byu.edu/facpub/226>

This Peer-Reviewed Article is brought to you for free and open access by BYU ScholarsArchive. It has been accepted for inclusion in Faculty Publications by an authorized administrator of BYU ScholarsArchive. For more information, please contact ellen_amatangelo@byu.edu.

Template Use and the Effectiveness of Knowledge Transfer

Robert J. Jensen

Department of Organizational Leadership and Strategy, Marriott School, Brigham Young University,
Provo, Utah 84602, robertjensen@byu.edu

Gabriel Szulanski

Department of Strategy and Management, INSEAD, 138676 Singapore, gabriel.szulanski@insead.edu

This paper is a direct empirical examination of the fundamental claim that use of templates enhances the effectiveness of knowledge transfer. We explore the effect of template use through an eight-year, in-depth field investigation of Rank Xerox (now Xerox Europe). The field investigation covers three sequential transfer efforts in 15 western European countries. The investigation reveals a naturally occurring, repeated-treatment quasi experiment that allows us to test the hypothesis that the use of templates enhances the effectiveness of knowledge transfer. “Observations” in this experiment measure the extent of adoption and performance of the practice at the recipient units. The “treatment” is the use of a template during the transfer.

Key words: knowledge transfer; exploitation of organizational capabilities; templates; replication

History: Accepted by Pankaj Ghemawat, business strategy; received September 10, 2003. This paper was with the authors 1 year and 3 months for 3 revisions. Published online in *Articles in Advance* August 3, 2007.

Leveraging knowledge assets within the firm is fundamental to realizing competitive advantage (Zander and Kogut 1995, Argote and Ingram 2000). Teece et al. (1997), echoing Nelson and Winter (1982), suggest that the most critical knowledge assets are embedded in organizational routines. A fundamental hypothesis states that the use of templates—actual working instances of the firm’s routines—increases the effectiveness of leveraging such assets through transfer within the firm (Nelson and Winter 1982, Winter 1995). This claim, however, has been contested to varying degrees, with some claiming that adherence to a template decreases performance (e.g., Kostova 1999) and others suggesting that it is sometimes unnecessary (e.g., Baden-Fuller and Winter 2007).

In this paper, we explore the connection between template use and the effectiveness of knowledge transfer through an eight-year, real-time investigation of three transfer efforts—two successful and one not—within 15 western European countries. The setting for our study is Rank Xerox (now Xerox Europe). Specifically, we focus on how relying on a designated benchmark impacts the extent of adoption of transferred practices and their performance at the recipient site. To this end, we treat the experience as a naturally occurring, repeated-treatment quasi experiment (Cook and Campbell 1979). In addition, we probe causal inferences drawn from the experiment by examining more than a dozen plausible alternative explanations. This paper provides a replicable

measure of template use as well as empirical grounds for evaluating the fundamental connection between template use and knowledge transfer effectiveness.

The Advantage of Using Templates

It has been argued that firm capabilities are often based on a set of organizational routines (Teece et al. 1997) that embody an important part of a firm’s productive knowledge (Nelson and Winter 1982). Leveraging that knowledge is seen as essential to realizing competitive advantage (Zander and Kogut 1995). Leveraging such knowledge, as Teece et al. (1997) argue, often entails reusing it effectively in different settings. Not only does it make economic sense for a firm to leverage superior routines by reusing or copying them rather than recreating them *de novo*¹ in each new setting, but it also makes sense to do so before competitors do (Nelson and Winter 1982, Teece et al. 1997, Rivkin 2000). A firm has an inherent advantage over potential imitators in reusing its own routines because it generally has privileged access to them (Winter 1995). When replicating its own routine, the firm can directly observe the routine in its totality.

¹ In theory, varying environmental conditions may change the key success factors of any given routine, rendering it ineffective. However, evidence suggests the advantage of leveraging capabilities via the replication of successful routines tends to persist despite widely varying environmental conditions (Ingram and Baum 1997, Jensen and Szulanski 2004, Szulanski and Jensen 2006).

An imitator, in most cases, cannot directly observe the entire routine to be copied and is thus at a disadvantage, especially when imitating less visible, yet potentially still essential, aspects of a routine.²

Nelson and Winter (1982, pp. 119–120) use the term *template* to refer to working examples of organizational routines. In their conception, templates contain both critical and noncritical aspects of the routine, providing the details and nuances of how the work gets done, in what sequence, and how various components and subroutines are interconnected. Scrutinizing the template not only allows for an examination of factors that may not be publicly available outside the firm but may also increase the likelihood that aspects of the routine that are tacit (Polanyi 1962) or causally ambiguous (Lippman and Rumelt 1982) are nonetheless transferred. Because leveraging knowledge assets through the replication of firm routines involves recreating productive knowledge from the source site, it follows that using the original routine as a template may facilitate knowledge transfer within the firm.

This claim, however, has been contested to varying degrees. For instance, international business scholars suggest that insisting on adhering too closely to a template decreases transfer effectiveness by inhibiting local adaptation (Bartlett and Ghoshal 1989, Prahalad and Doz 1987) and increasing local resistance to adoption (Kostova and Zaheer 1999). Baden-Fuller and Winter (2007) offer two examples of situations where principles (ideas encapsulating the knowledge to be transferred) are utilized more effectively in the transfer effort than are templates (working examples of the knowledge to be transferred). Finally, Rivkin's (2001) sobering analysis of the possibility of deriving competitive advantage from reproducing complex knowledge makes little mention of the actual value of using templates.

Notwithstanding the potential practical and theoretical importance of templates for realizing competitive advantage, systematic empirical evidence of the effect of templates is scarce. Of special concern is the absence of an accepted measure of template use.

Measures

Setting

To empirically examine the hypothesis that template use increases the effectiveness of knowledge transfer,

we report on a case study that includes a repeated-treatment quasi experiment that occurred naturally at the western European units of Rank Xerox. Under substantial pressure from Xerox headquarters to increase financial performance, Bernard Fournier, then CEO, launched a series of initiatives in September 1992 to increase revenue by identifying, documenting, and transferring best practices associated with sales processes. The initiatives were headed by a team of managers known internally as "Team C."

Whereas the first initiative in the series, referred to as Wave I (launched early spring 1994), proved successful, the second initiative, Wave II (launched late autumn 1994), stalled. The third initiative, Wave III, referred to internally as Telesales (pilot units implemented in autumn of 1995, with general implementation in January 1996), was successful. We investigated the period from 1992 to 1999.

Data Collection

We followed Yin (1989) in the initial data collection, employing a descriptive case study methodology aimed at accurately describing the three transfers. This stage of data collection occurred in real time over the entire eight-year period. The company granted us full access. Team C's leader, Carlos Camarero, acted as host and main informant throughout the entire period. Camarero facilitated access to all members of Team C as well as to senior managers of many of the country business units (CBUs). We visited headquarters at least once a year and several CBUs before, during, and after selected interventions. We also had access to individuals and internal company documents as required to clarify ongoing findings. Data on each "wave" were collected from multiple data sources, including interviews, direct observation, company documentation, a survey, and archival data.

After the initial data collection, and once members of Team C had approved our depiction of events, we published a set of case studies detailing the three waves (Szulanski and Casaburi 2004a, b; Szulanski et al. 2004). At this point we recognized that the data comprised a naturally occurring, repeated-treatment quasi experiment following the methodology developed by Cook and Campbell (1979), which would allow us to test the longstanding and fundamental hypothesis that template use increases the effectiveness of knowledge transfer. With a firm hypothesis in mind, we then reapproached our sources to collect additional data on the independent variable, template use. We collected additional firm archival data consisting of every document the firm still possessed concerning Team C (nearly 5,000 documents) and utilized semistructured interviews to focus on the role of templates (internally referred to as "benchmark units") in the knowledge transfer process. We

² It should be noted that the replication of organizational routines may not necessarily lead to an increase in performance. Although we are arguing that the use of templates may increase the effectiveness of knowledge transfer, it is possible that firms could replicate routines that achieve substandard results. A successful transfer in this regard may be effective, yet diminish recipient unit performance.

gathered additional data from the firm as necessary to address alternative explanations as they emerged. The following two sections detail how we measured template use and the effectiveness of the knowledge transfer.

Template Use. In line with Nelson and Winter's (1982, pp. 119–120) original conception of templates as working examples, a replication initiative is said to have used a template when the practice or routine being replicated (1) exists at the time of the initiative, (2) is composed of a single or connected series of processes, (3) is observable, and (4) is consciously used in the replication process. A template is not used if any of these elements is missing; that is, if the practice is not active, being either dormant or still an idea that has not yet been implemented (is not currently observable); if it consists of unconnected pieces (removing the possibility of observing the interconnections between the subroutines); or if its existence is ignored during replication.³ In this paper, template use is indicated by the designation of benchmark countries that possess the particular routine being transferred and that are explicitly involved in the replication process.

The Effectiveness of the Knowledge Transfer. We utilized two measures of knowledge transfer effectiveness. First, we measured the level of adoption of each initiative by the recipient units. This measure includes both the number of recipient units adopting the initiative and the level of implementation at each site. Level of implementation within a particular unit can be affected by other variables, such as difficulty of transfer, but also reflects the level of effort put forth by the recipient. Adoption is a suitable measure of the effectiveness of knowledge transfer because knowledge does not transfer if a recipient unit does not implement the routine in question. The level of implementation was measured through internal company assessments of implementation efforts that were jointly determined by headquarters and the recipient units. These assessments were taken a year after implementation efforts began for each transfer initiative.

Second, we measured the performance of the recipient units after implementation of the transferred routine. If one assumes, as is the case with each template in this study, that the routine being transferred was achieving superior results compared to those of the recipient units, one should expect to see an increase in performance in the recipient units upon effective implementation. As such, pre- and post-transfer measures of recipient unit performance are a good gauge

of the effectiveness of the knowledge transfer effort. Performance was measured by using available quantitative indicators, which included sales force productivity, sales force coverage of potential customers, and the ratio of selling costs to revenue.

Analysis of the Effect of Template Use

Here we describe the practices comprising the template, or templates, for each wave and the process used to transfer them. The description of each wave is followed by a discussion of the results of the measurement of template use and knowledge transfer effectiveness for that wave.

Wave I

Wave I Implementation. The first wave of the Team C initiatives (Wave I) began in 1993, with the practices being presented for implementation in early 1994. For Wave I, Team C searched for current, discrete best practices that could be easily transferred and implemented separately. These best practices would be transferred to other countries, with the originating country designated as the benchmark that others could consult and emulate.

Of a total of 40 identified best practices, Team C selected 10 that were then validated *in situ* to ensure that they did, in reality, produce superior results and were potentially transferable. The team emerged from this effort with nine validated best practices for revenue growth.⁴ Top management dictated that each country fully implement at least four of the nine.

Team C spent considerable time analyzing the key success factors underlying the superior results for each practice, eventually reducing these results to a manageable number of factors that could be easily implemented. They prepared and distributed an implementation manual written in easy-to-understand language. The manual first presented the data showing the differences in performance between the benchmark practices and those in other countries and then detailed the key success factors underlying the practices and how to implement them. The manual also included contact information for each benchmark site so that recipient units could contact key, experienced personnel for help in implementing each practice. After the manuals were distributed, Team C leaders visited each of the recipient countries multiple times to monitor implementation progress and help with emerging problems.

Wave I Results. According to the definition of a template as an organizational routine comprising a connected set of processes that are functioning, observable,

³ Templates do not have to exist solely within a firm. If an external routine possesses the above characteristics it may also be considered a template.

⁴ See the appendix for a description of the Wave I practices.

Table 1 Extent of Wave I Adoption^a by Practice Where Data Available^b

Practice	Average	United Kingdom	Germany	Switzerland	Austria	Spain	Nordic ^c
		Jan. 1995	Sept. 1995	Dec. 1995	June 1995	Nov. 1995	Sept. 1995
MajestiK	3.8	3	4	4	4	4	4
Customer retention	3.7	3	4	4	4	4	3
Docutech	3.8	4	3	4	4	4	4
DocuPrint	3.5	3	3	4	4	3	4
New business major accounts	3.8	5	—	3	4	5	2
Competitive machine in field	3.2	3	4	2	4	3	3
Analyst time billing	3.7	3	4	5	3	4	3
Secondhand centralized printers	4	4	5	5	1	4	5
Facilities management services	4.2	5	5	3	5	4	3
Percent of target achieved (4 practices)		100	150	150	175	175	100

^aRated on a scale of 1–5 where 1 = no implementation, 2 = planned implementation, 3 = partially implemented with major work still required for full implementation, 4 = implemented with minor work still required for full implementation, 5 = completely implemented. Concerning the percent of target achieved, Rank Xerox considered 4s and 5s to indicate a practice having been implemented.

^bAll 15 Rank Xerox European countries implemented at least four practices. Implementation data by practice is available for only nine countries.

^cNordic is the average for the geographic region comprising Sweden, Norway, Finland, and Denmark.

recurrent sets of behaviors, Wave I clearly used a template, or rather a set of templates. The nine practices were distinct sales practices, each currently in operation within a particular country unit. That unit was specified as a benchmark unit and actively used to transfer the practice, resulting in a set of nine separate templates for use in the knowledge transfer process.

Adoption of Wave I practices was high. The countries were required to implement only four of the nine practices to reach internal implementation targets. All 15 countries involved with the transfers met the goal of completely implementing at least four practices within one year. Many implemented more. Table 1 shows the extent of implementation by practice.

Not only was Wave I well implemented, but the transferred practices also performed strongly in the recipient units. Overall, in 1994 Wave I replicas generated more than \$100 million in additional revenue across all practices and another nearly \$100 million in 1995, far outpacing initial expectations.⁵ An example of performance gains was the increase in unit sales of color copiers attributable to the Wave I “MajestiK” initiative. Within one year of implementation, Switzerland was selling 328%, The Netherlands 300%, and Norway 152% more copiers (Stewart 1996). Every transferred practice generated a substantial increase in revenue beyond the costs of implementation; the costs totaled approximately \$1 million, with the average revenue increase exceeding the firm’s

target by 154%. Table 2 indicates the aggregate revenue gains attributable to each of the nine practices. Such increases in performance helped raise the average revenue per salesperson from \$368,000 in 1993 to \$400,000 by the end of 1994 (statistically significant at the $p < 0.05$ level).

Wave II

Wave II Implementation. Team C was inspired by the dramatic results of Wave I. Beginning in the second half of 1994, Team C decided to escalate the exploitation of existing practices to a more sophisticated level by defining an overarching best practice for the company’s entire sales process. At the core of the Wave II initiative was the idea of increasing salesperson coverage of potential customers’ buying

Table 2 Extent of Wave I Success by Initiative

Practice	1994 revenue estimate (\$M)	1994 revenue identified (\$M)	Percent of Target
MajestiK	25	45	180
Customer retention	10	21	210
DocuTech	5	15.2	304
New business major accounts	5	5.2	104
DocuPrint	—	4.5	—
Competitive machine in field	10	1.6	16
Analyst time billing	3	1	33
Secondhand centralized printers	4	2.6	65
Facilities management services	3	4	133
Total	65	100.1	154
Cumulative total through 1995		Approx. 191.6	

⁵ Although we do not have evidence beyond what is listed here of a direct link between Wave I and additional revenue, the Rank Xerox management at the time, which did have data on the direct link, attributed the additional revenue to implementation of the Wave I initiative.

decisions. Traditionally, Rank Xerox had rewarded salespeople based on the number of copiers sold per month. This led most salespeople to focus on current customers rather than prospecting potential customers. This tactic typically ensured the salespeople adequate sales per month but did not expand Rank Xerox's market share, which was approximately 15% in the European market. Internal data, adjusted for market size and photocopying volume, showed that countries that focused more heavily on covering potential customers' buying decisions were substantially more productive.⁶ Team C concluded that an overarching best sales practice focused on coverage of buying decisions rather than sales to existing customers could potentially triple the revenue gains achieved by Wave I.

Measuring sales productivity by the coverage of prospective customers instead of the number of copiers sold, however, entailed a basic shift that would alter not only how sales activity was measured but also daily salesperson behaviors and how the CBUs were assessed. Shifting the focus to coverage required changing more than just the incentive structure. A focus on coverage also required better territory planning and more intensive use of databases to track prospects and ensure that salespeople were contacting those clients who were about to replace equipment and who would potentially purchase enough new equipment to make a sales call worthwhile. Likewise, targeting, lead generation, activity planning, reporting, monitoring, and training activities had to be realigned to support the new focus. Ultimately, nine different interdependent activities, or subprocesses, had to be changed to adequately support the focus on coverage.

In an effort to replicate the success of Wave I by again reusing internal knowledge assets, Team C analyzed each of the countries, looking for best practices that corresponded with one or more of the individual subprocesses. They found these practices scattered randomly throughout the countries. The assembly of the best-in-breed sales subprocesses resulted in a composite process that detailed new action plans for each aspect of the Rank Xerox sales process. The different subprocesses were considered separate but sequentially interdependent modules that, together, comprised the new "Sales Force Management Activities Model." The sequentially interdependent nature of the modules was made explicit to the CBUs both verbally and in writing.

As with Wave I, an extensive manual was produced, which detailed the superior performance of

the subprocesses, or modules, in the countries where they were currently in operation and included key success factors and steps for implementing each subprocess. The book was written in easy-to-understand language but also in exacting detail that carefully described the plan for combining the modules into a coherent and complete new sales process. Once the manual was ready, it was presented to the management teams of each CBU by Team C leadership in a series of "road shows" meant to increase motivation for implementing the new practice. As with Wave I, Team C members traveled extensively during the implementation process to monitor progress and to encourage and support implementation.

Wave II Results. Unlike Wave I, Wave II did not have a template to use. The definition of a template requires that a practice be composed of a single or interconnected series of practices that are observable and currently in use. The practices being replicated in Wave II, while existing in separate business units, did not exist as a unified, functioning whole in any one location. Had the transfer consisted of separate, distinct practices as in Wave I, templates would have existed for each subprocess. However, the practices were linked conceptually but had never been tested or used together before. The new sales process consisted of highly interdependent modules that, as a whole, had not been tested and were not in operation, resulting in a transfer without a template. Team C member Ricardo Morais explains, "We tried to do something ideal but totally logical. But that thing, with those pieces, never existed [before] in that way."

Unlike Wave I, adoption of the new sales practice was low. Some countries openly refused, but most feigned enthusiasm while giving implementation only a token effort.⁷ Moreover, average sales force coverage, the key metric for Wave II, remained stagnant, and sales force productivity actually declined. Within a year of launch, the CEO discontinued the project, and the CBUs ceased even token attempts to implement it.

Of course, there was at least partial implementation of the new practice in many locations. However, the new sales practice consisted of a series of nine interdependent modules. For the practice to operate effectively, all nine modules had to be implemented satisfactorily. Over a year into the implementation effort, only one country, Greece, had sufficiently implemented more than two-thirds of the modules necessary to operate the Wave II practice. The average level of implementation was under 40%,⁸ with

⁶ A few countries, such as Spain and Portugal, already had practices in place that emphasized some degree of coverage. However, none of the existing practices, in the eyes of Team C, went far enough.

⁷ This is similar to Zbaracki's (1998) study of TQM adoption in which managers often engaged in rhetoric that was not followed by actual implementation of the practice.

⁸ For comparison purposes, there was 100% implementation of Wave I. This is calculated as adequate implementation (4 or 5 rating

Table 3 Extent of Wave II Adoption

Country	Percent of red modules	Percent of yellow modules	Percent of green modules	Percent of Green
Austria	3	4	2	22
Belgium	2	2	5	56
Denmark	1	2	6	66
Finland	2	1	6	66
France	0	7	2	22
Germany	3	4	2	22
Greece	0	2	7	78
The Netherlands	0	4	5	56
Italy	3	4	2	22
Norway	3	4	2	22
Portugal	0	3	6	66
Spain	8	0	1	11
Sweden	2	6	1	11
Switzerland	0	4	5	56
United Kingdom	3	5	1	11
Total	30	52	53	39

more than one country at only 11% completion. Furthermore, upper management suspected that many who had reported full implementation of specific Wave II modules had not actually done so. Instead, they were believed to have implemented only cosmetic changes in an effort to placate top management without making the fundamental alterations necessary to fully implement the modules. For instance, one year into the implementation process, despite self-reports showing reasonable levels of implementation, only about 10% of the salespeople were actually using the database software central to Wave II success.⁹

Table 3 shows the color-coded implementation self-reports submitted approximately a year after the Wave II launch. Red indicates critical problems with implementation. Yellow indicates that significant improvement is required before the practice can be considered to have been implemented. Green indicates that implementation is satisfactory. The figures in the table represent the number of modules in each color category. A full year into implementation, most countries had not made much progress.

Wave III—Telesales

Wave III—Telesales Implementation. On a separate assignment during Wave II, the CEO suggested

from Table 1) to fulfill the requirement of four practices within one year. With Wave I all countries adequately implemented all nine practices within two years. Even if one were to require all nine practices to be implemented in the first year, the implementation rate would have been 63%, substantially higher than Wave II implementation.

⁹ This is reported by Camarero and was derived from Team C's monitoring of Wave II implementation.

that Camarero, the head of Team C, visit the Rank Xerox operations in Dubai, United Arab Emirates. Since 1993 the salespeople there had contacted customers mostly by telephone, rather than face-to-face as was done in Europe, primarily to escape typical temperatures that exceed 44 °C.¹⁰ The results, in the eyes of both the CEO and Camarero, were extraordinary. In late 1994 Camarero visited Dubai to observe the operations. He was impressed with the results and, as implementation of Wave II began to falter in 1995, decided to analyze the Dubai situation further. Although Camarero did not recognize it at the time, he later realized that the sales practice in Dubai, called "Telesales," accomplished almost exactly what he was trying to do with Wave II and in many of the same ways. In fact, the Telesales practice in Dubai focused on coverage and incorporated all nine of the interdependent submodules of Wave II, with the exception that three were embedded in a piece of software. Through using the telephone as the primary mechanism for customer contacts, the results were even better than had been expected with Wave II. As Camarero explained:

We found out that [in Europe] our salespeople were averaging ten customer visits a day, but only one of them was effective. This way (i.e., using Telesales) they could rapidly complete the effective transaction and had plenty of time left to average 2.5 effective transactions per day, thus doubling their productivity.

Camarero decided to transfer the Telesales practice to the western European countries. Following the same method used in Waves I and II, he extracted the key elements of the Dubai practice. He then put together a manual similar to the one used in both previous waves, detailing the extraordinary performance of Dubai, describing the key factors of the Telesales practice, and explaining how to implement it.

The management in Dubai had embedded the elements having to do with database management, reporting, and record keeping in a piece of software called TeleMagic, making integration of those three aspects of the sales process relatively easy. Team C considered the information technology (IT) aspect of the project to be an important enabler. However, as Team C member Ricardo Morais suggested, he would never have been able to use IT as an effective enabler for the project if Dubai had not already been using TeleMagic. Not only did Dubai's use of TeleMagic provide the initial impetus for the use

¹⁰ The Telesales practice did not begin with Dubai. Dubai transferred the practice from Rank Xerox's Colombia unit, where the practice had initiated a year or two prior to Dubai's adoption in response to the abduction of two salespeople.

of IT (the understanding that one could use such software, which was commercially available, to sell large copy machines by telephone), but it also provided an understanding of how to successfully connect the software with the less technological aspects of the Telesales practice. The key success factors, while including IT, referred to all nine interdependent subprocesses, and Dubai was used multiple times as a referent to solve non-IT-related implementation problems.

For example, after implementation had been under way for a couple of months, the pilot centers discovered that they did not know how to operate Telesales for salespeople responsible for key accounts with major corporations. It did not seem to make sense to approach large firms by telephone for sales often totaling tens of thousands of dollars. In response, Camarero returned to Dubai. There he found that those responsible for key accounts used the telephone as much or more than those responsible for smaller firms because the units of large corporations often bought separately and were headed by people who were too busy for numerous personal visits.

The Telesales initiative began in late 1995 with a series of pilot implementations in Lisbon, Birmingham, Lyon, Brussels, and Madrid. To persuade the managers of these units to undertake the initiative, Camarero not only shared with them data proving the superior performance of Dubai but also flew them to Dubai so they could observe the practice in operation. The Telesales practice, like Wave II, was considerably more complex than the practices transferred in Wave I in that it involved a fundamental restructuring of the sales force management process that relied on a series of interdependent modules. Consequently, implementation was not quite as smooth as in Wave I. It took a few months, along with a number of iterations back to Dubai to answer unforeseen questions, for the pilot units to begin to reproduce the superior results found at Dubai.

After a few months, however, the transferred practice achieved comparable results, and the pilot units were designated as benchmarks for the rest of the corporation. As he had done in persuading the pilots, Camarero brought hundreds of managers to the pilot in Lisbon to observe the operations in an explicit attempt to increase motivation to adopt the new practice. In Camarero's view, Telesales materialized the theoretical model of Wave II. He said, "It was an opportunistic exercise where theory turned into practice. It allowed potential recipients to see, eat, chew, and touch the practice. It was seeing with their own eyes that $2 + 2 = 4$, not just being told."

Wave III—Telesales Results. Fulfilling the requirements of a template, the Telesales practice was,

at the time of the transfer, observable and in operation as a functioning, complete practice in Dubai. It was not a set of discrete, independent practices as in Wave I, but, unlike Wave II, the interdependent subprocesses in Telesales were in operation as a combined whole. As with Wave I, both adoption and performance were high. Within six months of launch, the initiative had been fully implemented in all 15 Rank Xerox western European countries. The chairman's statement in Rank Xerox's 1996 Annual Report noted that Telesales significantly improved sales coverage (a key Telesales metric) and increased market share. Within a year of implementation, average sales coverage had increased by 11% (significant at the $p < 0.01$ level when lagged to allow for issues of incomplete data for 1996), with some units increasing as much as 30%. Sales productivity rose accordingly (significant at the $p < 0.001$ level), and the ratio of gross profit to sales expense doubled (significant at the $p < 0.001$ level) without the significant loss of customers that might be expected if the practice represented only short-term sales at the expense of long-term customer satisfaction.¹¹

Analysis of the Evidence

Table 4 compares key performance metrics for pre- and post-implementation of the three waves. The comparison highlights the conclusion that Wave II was not successful, whereas the other two initiatives were. Given the size and complexity of the Telesales initiatives, we include the key metrics lagged one year as well. Although technically one would expect the same lagged effect for Wave II, the lack of implementation forestalls any such effect. Because relatively few CBUs, if any, implemented Wave II to any meaningful degree, the effects seen in 1996 and 1997 can safely be related to Telesales, which was fully implemented within six months of launch. *t* statistics comparing the means of the 15 major Rank Xerox European countries across time periods, as well as *p* values, are reported below the metric where available.

Overlaying the patterns of template use, adoption, and performance discussed above produces the pattern shown in Table 5.

All available indications suggest that template use and the effectiveness of knowledge transfer efforts are correlated.

To further our analysis, we treat the evidence as a naturally occurring, repeated-treatment quasi experiment. We do so to assess the extent to which the evidence might support the basic claim that template use enhances the effectiveness of knowledge transfer,

¹¹ They experienced a 1% decline in customer loyalty, which was attributed to downsizing and fluctuations of customer loyalty in the industry as a whole.

Table 4 Wave I, Wave II, and Telesales Performance Metrics Compared Using *t*-Tests

	Pre-Wave I (1993)	Post-Wave I/ Pre-Wave II (1994)	Post-Wave II/ Pre-telesales (1995)	Post-Telesales (1996)	Telesales lagged (1997)
Mean sales coverage ^a	Not applicable	29.14	29.14 (<i>t</i> 0.00, not sig.)	32.36 (<i>t</i> 2.07, <i>p</i> < 0.10)	33.11 (<i>t</i> 3.70, <i>p</i> < 0.01)
Mean sales coverage versus 1994 ^b	Not applicable	30.53	Not applicable	33.01 (<i>t</i> 2.50, <i>p</i> < 0.05)	33.89 (<i>t</i> 2.53, <i>p</i> < 0.05)
Mean direct sales revenue/salesperson (in thousands)	368	400 (<i>t</i> 2.50, <i>p</i> < 0.05)	385 (<i>t</i> 1.36, not sig.)	452 (Not available ^c)	481 (<i>t</i> 4.74, <i>p</i> < 0.001)
Mean ratio of gross profit to selling expenses	Not available	1.06	1.19 (<i>t</i> 2.82, <i>p</i> < 0.01)	Not available	2.02 (<i>t</i> 7.89, <i>p</i> < 0.001)

^a1995 sales coverage data were available only by geographic region (northern, southern, and central) except for the three largest countries (Germany, France, and the United Kingdom), for a total sample size of seven. To make comparisons with other periods, similar aggregate means are computed for geographic areas in other periods as well.

^bComparisons for 1994 versus 1996 and 1994 versus 1997 include data for each country involved in the transfer effort, rather than regional aggregates, for a total sample size of 15.

^cData for direct sales revenue in 1996 is available only in aggregate form, not broken down by country.

that is, to assess the degree to which the data may be suggesting a causal relationship (Cook and Campbell 1979).

Such an approach is applicable to situations where there is only one population and where the treatment is applied, removed, and applied again to the entire population (Cook et al. 1990). Although the researcher is not expected to have control over the incidence of the treatment, he or she is expected to know precisely when the treatment occurred (Cook 1991). The specific research design is known as a repeated-treatment quasi experiment (Shadish et al. 2002) or repeated-measures design (Trochim 2001, see Barlow and Hersen 1984 for an application in psychology). The quasi-experimental nature of the design increases the need to carefully weigh potential alternative explanations.

The explanatory power of the design, which is depicted below, hinges on the repeated incidence of the treatment. *X* indicates application of the treatment, and */X* indicates its removal. The most interpretable outcome occurs when *O*₁ (the first observation) differs from *O*₂, *O*₃ differs from *O*₄, and the *O*₃ – *O*₄ difference is in the same direction as the *O*₁ – *O*₂ difference.

$$O_1XO_2/XO_3XO_4$$

The treatment in our study occurs when a template is used in the transfer. When a template is used we expect to see both higher adoption and better performance at the recipient unit than when a template is

Table 5 Correlation between Template Use and Knowledge Transfer Effectiveness

	Wave I	Wave II	Telesales
Adoption	High	Low	High
Performance	Successful	Unsuccessful	Successful
Template used?	Yes	No	Yes

not used. That is, we expect that *O*₂ (adoption and performance after Wave I) will be higher than *O*₁ (adoption and performance prior to Wave I) and that *O*₄ (adoption and performance after Telesales) will be higher than *O*₃. This is clearly consistent with the evidence.

Alternative Explanations

We now consider alternative explanations for the observed pattern of outcomes. In order for alternative explanations to template use to account for the observed pattern they must follow the same pattern as that of template use—that is, be applied, removed, and applied again (Cook and Campbell 1979, Shadish et al. 2002)—or there must be at least one plausible explanation for each of the three waves of the experiment. To increase the chances of generating a comprehensive set of alternative explanations, we organized plausible alternatives following the quasi-experimental logic suggested by Cook and Campbell (1979), categorizing the alternatives into selection, maturation, history, attrition, instrumentation, and testing (see Shadish et al. 2002, p. 55).¹² Within these categories we begin with the most plausible rival explanation and continue in decreasing order of plausibility. Table 6 summarizes the alternative explanations and the arguments against them.

Selection: Systematic Differences in Conditions Cause the Observed Effect

One potential alternative explanation is the use or misuse of IT. In essence, Wave II may have failed by

¹² There are other potential categories of alternative explanations, such as ambiguous temporal precedence, regression to the mean, and additive and interaction effects, which are not included here because the repeated-treatment design renders them less relevant.

Table 6 Summary of Alternative Explanations

Explanation	Counter-argument
Selection	
Wave II and Telesales dependent on IT, not template. Wave II did not utilize effectively, while Telesales did.	Practice in Dubai consisted of nine interdependent subprocesses of which only three were embedded in software. Moreover, template provided (1) idea for using software, (2) routines for how to use software, and (3) routines for connecting software to non-IT-based subroutines. Dubai clearly used as template outside of IT use.
Pattern is due to differences in complexity and subprocess interdependence.	Telesales similar to Wave II in complexity and subprocess interdependence.
Pattern due to differential expectations as to ease of implementation and subsequent actions, especially the use of pilot centers.	The use of pilot centers underscores importance of templates because the template in Dubai was clearly used to establish pilot centers, and pilot centers themselves were then explicitly used as templates.
Pattern due to differences in pressure to improve results.	Level of pressure was similar for both Wave II and Telesales.
Pattern due to differences in top-management support.	All three had top-management support, with Wave II having significantly more support than Telesales.
Pattern due to differing perceptions of initiative as “good” or “bad” idea.	Idea for both Wave II and Telesales, 100% coverage, was identical. Moreover, template in Telesales was explicitly used to persuade CBU management it was a “good” idea, highlighting the value of templates.
Maturation	
Phase of business cycle caused the pattern.	The processes of treatment, removal of treatment, and retreatment did not coincide with natural phases of the business cycle.
Pattern due to general European business climate.	Aggregate GDP grew constantly from 1994 to 1997.
History	
Pattern due to luck.	The serial pattern occurred simultaneously, albeit not necessarily independently, in 15 countries.
Pattern due to competitors’ situations.	Pattern occurs similarly across 15 countries. Competitors’ situations not likely to be the same nor to change simultaneously in all 15 countries.
Attrition	
Pattern due to personnel turnover.	No turnover in Team C and minimal turnover in CBU top management.
Instrumentation	
Changes in the template or implemented practice make it difficult to tell if a template was used.	Process of implementing extracted key success factors provides a measure of similarity. Description of Telesales implementation provides evidence of direct template use. Wave II lacks template because overarching model not in use anywhere. Choice of model versus independent and existing subprocesses made by firm.
Testing	
Understanding of cause and effect after first treatment biases removal of treatment and retreatment.	Actors didn’t understand nature of treatment until after entire experimental period was over, and interest is in concrete actions, not psychological states.

not effectively utilizing IT, whereas Telesales was successful solely because of its innovative use of software. However, such an explanation belies the fact that the Telesales transfer initiative succeeded not simply because of the TeleMagic software. Indeed, the template, as it existed at Dubai, provided not only the software but also the idea and proof that copy machines could be sold by telephone, the scripts for how to sell copy machines by telephone, and an example of all nine interdependent subprocesses working concurrently in a single practice. Contact software, including TeleMagic, was available publicly, but it is unlikely that a third-party software vendor could have provided the level of information necessary to re-create the superior results obtained by the template site. Telesales was not reducible to software alone as evidenced by the repeated iteration back to

Dubai to solve implementation problems unrelated to IT.¹³

Connected to this potential explanation is one suggesting that the pattern arises from differences in the level of complexity and interdependence among the three initiatives. For instance, Wave I was simpler, consisting of completely separate, modular practices that were extensions of existing practices, requiring only moderate levels of change. Wave II, on the other hand, was made up of nine interdependent practices that had to be implemented in serial fashion,

¹³ An example of non-IT-related iteration occurred the first time the pilot was to make a Telesales call. That day Camarero and 29 senior managers were on hand to make the first telephone call, only to find out that they did not know what to say. How do you sell expensive copy machines by telephone? As a result, they went back to Dubai to obtain the telephone scripts.

ultimately requiring a large change in existing routines—which caused the different results.¹⁴ The Telesales practice, however, effectively embodied the Wave II model. Although somewhat less interdependent (embedding three of the nine interdependent modules in software), it still required the serial implementation of seven interdependent modules and resulted in the same large-scale change as did Wave II. For complexity alone to be an alternative explanation, one would have to argue that the point of maximum complexity, beyond which a practice cannot be effectively implemented, lies somewhere between seven and nine serial, interdependent processes. Although theoretically possible, such a result seems unlikely.

Alternatively, the pattern of success may be due to Team C's use of pilot centers during the Telesales phase and not during Wave II. Although the pilot centers likely had an impact on knowledge transfer effectiveness for Telesales, this underscores rather than negates the value of template use. One could argue that, even with a complex practice, a pilot center is easier to establish because one has tighter control and may be able to engage in more rapid experimentation to achieve desired results. However, the practice in Dubai was transferred to six pilot centers concurrently, all of which were successful within a short period of time. The case description highlights the specific role of the template in (1) persuading the heads of CBUs to undertake a pilot and (2) providing a reference during the implementation of the pilot centers as unforeseen problems arose. Furthermore, the pilots were then used as templates during the process of transfer to the rest of the units. In a sense, pilot centers may play a role of intermediate template. For instance, in this particular case there was some question as to whether a practice from a small city like Dubai would be relevant to large European urban centers. The use of pilots allowed for additional testing of the knowledge embedded in the template routines before widespread implementation. Pilots as intermediate templates highlight rather than undermine the argument that templates in general increase the effectiveness of knowledge transfer.

Another potential explanation is that the CBUs were under significant pressure to improve sales revenue prior to Wave I and that the subsequent Wave I success removed that pressure. Although this possibly explains the lack of adoption of Wave II, Rank Xerox continued to be under some, albeit less, pressure from Xerox USA to improve performance. Moreover, the same lower level of pressure to improve performance

held for the Telesales phase and for Wave II. Pressure would have to have been high for Wave I and Telesales and low for Wave II for this explanation to be the cause of the pattern of adoption noted in the description.

The level of pressure for adoption is related to the issue of top-management support. Potentially, Wave I and Telesales enjoyed high top-management support, whereas Wave II did not. This is not the case, however, because all three initiatives had significant top-management support, with Wave II actually enjoying more support than Telesales. Indeed, the year it was launched, the CEO personally introduced Wave II as one of the top priorities for the Rank Xerox western European countries, something he did not do for Telesales. In addition, bonuses were tied to the implementation of Wave II, whereas they were not tied to Telesales, suggesting somewhat lower support. This indicates that the observed pattern was not due to different levels of top-management support and strengthens the case against differing degrees of pressure for adoption. Had there been an increase in pressure for adoption, one would expect to see increased degrees of pressure or support from top management during that wave. The fact that this did not occur during the Telesales phase weakens these two potential explanations.

It may also be that the levels of adoption and implementation resulted from a perception of the initiative as either a good or bad idea. However, the idea of coverage was fundamental to both Wave II and Telesales and dated to 1988—prior even to the beginning of Wave I. As senior Team C member Olaf Odland pointed out, "In the beginning we didn't have Telesales But we had from the beginning [the idea of] 100% coverage of the buying window in the sales process." It is still possible that CBU management may have perceived the embodiment of the idea, not the coverage idea itself, as good and appropriate in Telesales and not in Wave II, but such an argument underscores the use of the Dubai template to prove the efficacy of the idea, something that could not be done in Wave II because it had no template.

Maturation: Naturally Occurring Changes over Time Cause the Observed Pattern

Although cyclical forces in the firm's business cycle may have caused the pattern of performance, it is not likely. Each phase of the sequence of treatment, removal of treatment, and treatment spanned multiple months and did not coincide with the natural business cycle. If this explanation had caused the observed pattern, one would see specific segments, such as removal of the treatment, occurring at times of the year when sales were typically low. This does not occur. Furthermore, outside the interventions observed in the experiment, the main direc-

¹⁴ This is similar to the concept of multiplicative relationships developed by MacDuffie (1995).

tion and processes of the organization did not change significantly during the period of the experiment.

Alternatively, the pattern may have been caused not by the business cycle specific to the firm but by the general business climate in Europe. However, aggregate GDP, after a slight decline of 0.37% in 1993, rose consistently through the period, varying between 1.6% and 2.75% growth. Again, one would expect to see a period of growth, decline, and growth coinciding with the timing of treatment, removal of treatment, and second treatment. This did not occur.

History: Concurrent Events Cause the Observed Pattern

Another possibility may be that the observed pattern is due solely to chance. A simplistic analysis that treats each “wave” as a transfer that either succeeds or fails yields a total of eight possible success or failure patterns. Under such a scenario, the highest probability of observing the actual pattern by chance is no higher than 15%, assuming a two-thirds probability of success for each transfer, and is 12% when assuming a more realistic 0.5 probability of success. At the other extreme, when each wave is conceived as 15 independent transfers (one for each of the 15 countries), the probability of all 15 countries achieving success by chance (0.5 chance of success) in either Wave I or Telesales alone is a negligible 0.00003 per wave. Of course, there is likely to be some degree of decision interdependence, although Rank Xerox country managers, especially those heading country units with natural European rivalries, enjoyed significant autonomy from one another. A conservative assumption would take into consideration the differing adoption rates observed in Waves I and II considering at least two separate groups: early and late adopters. Even considering such high decision interdependence, the probability of the observed pattern is lower than 0.02. Thus, it seems unlikely that chance alone could explain the observed pattern.

A similar explanation is that the pattern of results in the dependent variable is due mainly to competitors’ actions rather than to actions taken by Rank Xerox. However, the pattern is observed simultaneously across 15 different countries and temporally follows the application and removal of the treatment. For competitors to be the cause, one would expect variable performance and timing of performance changes across the 15 countries, because competitors’ positions are not likely to be the same in all locations.

Attrition: Loss of Respondents Causes the Observed Effect

It may be possible that the results were achieved because the individuals involved were not the same

in each wave of the experiment, thereby creating differing performances by virtue of differing personnel. However, Rank Xerox experienced only typical personnel changes during the period in question, with no turnover in Team C and minimal attrition in top CBU management.

Instrumentation: The Nature of the Measures Changes over Time, Causing Confusion with the Observed Effect

This threat to validity involves potential measurement error in the independent variable. If change in the template itself or adaptation of the practice during the transfer process creates enough measurement error, whether or not a template was “used” may be called into question. However, each wave used the same process, involving the codification and transfer of key success factors (codification that clearly involved the use of templates). The implementation of the key success factors becomes a primary method for judging the extent of implementation, providing a rough measure of similarity to the original. Moreover, the Telesales initiative provides further evidence that the template was a critical part of implementation, because there were multiple iterations back to Dubai to address unforeseen questions.

Likewise, one may argue that Wave II consisted of templates in the same way that Wave I did and that the difference in outcome is a result of choosing the level of analysis. Although Wave II, on one level, did consist of independent practices, the Wave II model required serially interdependent implementation of all practices to be successful. In addition, the choice of a serially interdependent model, one for which there was not a template because the entire model was not in use anywhere, was a choice made by the firm and not the researchers, suggesting the appropriateness of labeling Wave II as lacking a template.

Testing: Exposure to the First Treatment Affects Results of Later Treatments

A typical threat in quasi experiments is testing, where subjects discover the nature of the treatment from their first exposure and alter their later responses as a result. This type of alternative explanation, however, is more viable in psychological tests where one is measuring subjective states than it is in tests measuring the effect of concrete actions. The interest here is in the possibility that an action resulted in an increase in knowledge transfer effectiveness, whether or not the subjects understood the cause-and-effect relationship at the time. Nevertheless, the actors involved in the transfers did not understand the nature of the treatment until after the experiment was over, minimizing testing as an alternative explanation.

Finally, we recognize that there may be unmeasured variables that account for the results. However, the repeated treatment design helps to mitigate this.

The fact that the result was replicated in the second treatment, which was applied years after the first treatment, significantly enhances the possibility that the results arise from the use of a template and not from some other cause.

Discussion and Conclusion

Our direct empirical investigation of template use and the effectiveness of knowledge transfer contributes to the literature on knowledge transfer, firm capabilities, and evolutionary economics. It does so primarily by yielding a replicable measure of template use and providing empirical support for the fundamental claim that template use enhances the effectiveness of knowledge transfer. Furthermore, our field evidence allows us to complement extant knowledge by suggesting several roles that templates may play during the transfer process.

A Measure of Template Use

Following Nelson and Winter (1982, pp. 119–120), we defined template use as reliance on an organizational practice that is currently in existence, observable, composed of a single or connected set of processes, and consciously used in the replication process. According to this definition, a template was not used in the Wave II initiative because it relied on existing subroutines that were scattered throughout Europe. Such a collection of practices does not constitute a template because those wishing to scrutinize the original could not find the composite routine working as a complete set in any one location. The poor performance of Wave II suggests that attempts to combine parts of existing routines may result in decreased transfer effectiveness.

In light of this, the investigation of templates reported here contributes to the literature on the capabilities-based view of the firm. The findings suggest that it may be difficult to parlay a collection of small practices or the modification of an existing practice into a core competence. This suggests a source of variance in combinative capabilities (Kogut and Zander 1992). Without a tangible instance of the “resource” or “capability,” that is, without a template, the resource may not really exist—at least not in a readily replicable form.

The Roles of the Template: Referent and Persuader

Templates play the role of referents during the transfer process. Specifically, through closer scrutiny of the original, templates are used to resolve problems that arise during the replication attempt (Nelson and Winter 1982, Winter and Szulanski 2001), the importance of which is likely to increase as routines become more difficult to transfer. The Rank Xerox example illustrates exactly such a pattern. A template was used more frequently as a referent during the Wave III—Telesales initiative than during the simpler Wave I

initiative. During Wave I the template was primarily used as a reference by the source units and Team C to codify the key success factors of the various practices. Iteration was infrequent because the practices, once understood, were fairly simple to implement. The Telesales initiative was larger and more complex than Wave I, encompassing more people and several interrelated subprocesses. As expected, the amount of iteration between template and replica increased in the Telesales wave.

The concept of templates as referents, then, suggests an explanation for the pattern of iteration between original and copy that is seen in the data. It does not explain, however, the variance in the pattern of initiative adoption. Having access to a template does not ensure that the template is used. A referent is especially useful after implementation has begun.

The definition of a template, however, suggests yet another mechanism of operation, that of persuasion. A template, in this usage, is something that ought to be copied, such as an organizational practice being transferred because it consistently produces superior results. It is synonymous with concepts such as prototype, model, and exemplar, an “example or model deserving imitation” (Oxford English Dictionary 1989). This suggests that the existence of a template may help initiate the transfer. Organizations often have difficulty getting recipient units to adopt new practices. The use of templates, as scholars in the change management literature have suggested (e.g., Armenakis and Harris 2002), helps overcome resistance by demonstrating results and providing evidence of efficacy because someone else in the organization has already successfully used the practice.

Without a template there are no data on potential results and nothing to observe showing whether an idea, a composite of previously unconnected routines, or significant adaptation of an existing practice will work as planned. Recipients have to rely on faith rather than proof when making the decision to implement, thus lowering the incentive to adopt. In talking about Wave II, Camarero described this problem as follows:

What we did was to take pieces of the best practices and create the perfect model that was seen as artificial because in reality it was artificial because nobody had this thing. There is nothing new about [the pieces]. But this [model] is absolutely new. Nobody had done it before, nobody had seen this model. So the reaction, the human one, was, “Oh, I will not be able to implement this thing. . . .” But because they could not escape that they had to do it they took the second way out saying, “I’m going to do it,” with the clear intention not to touch it.

In contrast, concerning Wave III–Telesales, Camarero said:

I took them [to Dubai] in order to get credibility, because they look at you and they say “Dubai produces double?” They don’t like it. They don’t want to believe it. This is the principal about best practices—denial. [But] they went and talked to the people and checked if it was true. It confirmed the performance. So what do you do after that? You have no choice but to believe, even if you don’t want to believe. The results are the results and nobody can go against that.

Therefore, because of demonstrable results and evidence of efficacy, using a template is likely to increase the likelihood that a transferred routine will be adopted. As with the referent mechanism, the data in the Rank Xerox case fit this theorized pattern well. Wave I and Telesales both used templates and were adopted by all countries, whereas Wave II did not use a template and was poorly adopted. The existence of the templates and the published results they created seemed critical to adoption. With all three initiatives data from the practices (with Wave II this consisted of data from the unconnected subprocesses) were explicitly used to persuade, and with Telesales this was combined with extensive observation of the template. With all three initiatives recipient units were highly skeptical and initially unwilling to adopt the practices. With Wave II they remained unconvinced, because the composite practice was nowhere in operation and there were no data showing that the practice, in its totality, was practicable. However, with Wave I and Telesales the existence of data proving the successful results of the working practices, as well as opportunities to observe the practices, overcame the resistance.

Limitations and Future Research

Our conclusions are drawn from the study of a single company and pertain specifically to sales practices. It should be noted, however, that the type of best-practice transfer process that Rank Xerox underwent, internal benchmarking, is ubiquitous across industries, and its basic format is relatively independent of the type of practice being transferred (Camp 1989). Moreover, replicating superior templates is a fundamental mechanism underlying the growth of chain and franchise organizations (Bradach 1998). Finally, we are not aware of any characteristics of Rank Xerox or of its served markets that would systematically enhance or dampen the effect of using templates. Hence, we expect the results to be applicable outside of Rank Xerox.

Another limitation of our study is that, although we can provide anecdotal evidence of the different mechanisms by which the template affects the effectiveness of the transfer, we cannot establish systematically how and through which mechanisms the template

enhances the effectiveness of the transfer. This suggests the need to further examine the specific mechanisms through which templates affect the transfer process.

As Teece (1998) points out, although there are many potentially valid research issues that one could identify in the management of knowledge assets, there are several topics that are particularly salient and warrant special attention. One of them is the need to test whether firm-level competitive advantage flows fundamentally from difficult-to-imitate knowledge assets. The analysis of Rank Xerox provides some evidence that it does. Furthermore, it suggests that substantial progress could be achieved in that agenda by attending to the concept of templates.

In specific, the rich description of the Rank Xerox example raises additional questions about templates that deserve additional study. First is the possibility that templates serve two primary purposes: both to persuade adoption and to overcome implementation difficulties during transfer. Are these the primary mechanisms through which templates operate? In addition, the description of the Telesales phase raises the possibility of intermediate templates. The concept of intermediate templates raises questions of whether and when they are needed when an original template exists, their characteristics vis-à-vis original templates, the nature of their intermediate role, and how to deploy them effectively. Finally, the description of the Telesales phase also raises the possibility that suitable templates may exist unnoticed in firms. Although firms have lamented for years that they often “don’t know what they know” (O’Dell et al. 1998), this study highlights the potential role of top management in bringing such knowledge to light. Although the idea that template use increases the effectiveness of knowledge transfer has been a foundation of studies addressing the question of differential firm performance, much work is still needed to understand the mechanisms through which successful transfer occurs.

Acknowledgments

The authors contributed to this work equally. The authors acknowledge helpful suggestions from Christophe Van den Bulte, Dan Levinthal, Nicolaj Siggelkow, Carlos Camarero, Olaf Odlinson, Linda Johanson, seminar participants at various universities, anonymous reviewers of the Business Policy and Strategy Division of the Academy of Management, and the editor and anonymous reviewers at *Management Science*. In particular, the authors thank Sumantra Ghoshal for the challenge to find a method for testing theory with case studies and Sid Winter, who was an integral part of this journey. Sid was the advisor for the dissertation from which this paper comes and has been a full partner in the development of the ideas and in the field work. This paper truly stands on his giant shoulders. Errors and omissions are solely the authors’ responsibility.

Appendix. Description of Wave I Practices

Customer retention	A plan to encourage current customers to repurchase equipment from Rank Xerox by providing special incentives to salespeople for customer retention as well as technological database aids for tracking customer equipment stocks, usage requirements, and contract expiration dates.
MajestiK	An initiative to increase market share in the European color copier market.
DocuTech	An initiative to sell offset printers to commercial and educational users by focusing on overall document solutions rather than on traditional product or price selling.
New business major accounts	A plan to establish salespeople whose sole responsibility is generating new business.
DocuPrint	A plan to accelerate sales of the newly launched line of high-speed network printers, particularly to the banking and insurance industries, by emphasizing the product's image printing capabilities and systems integration features.
Competitive machine in field	An initiative for rapid updating of the Rank Xerox company-wide sales database to track competitive information and provide salespeople with reliable leads.
Analyst time billing	A plan to sell the value-adding, problem-solving consulting services of Rank Xerox technical analysts.
Facilities management services	A plan to educate salespeople on how to sell facilities management services effectively through the creation of simple packages and pricing options (i.e., Rank Xerox providing the customer a packaged service consisting of both equipment and manpower).
Secondhand centralized printers	An initiative to regain control of the secondhand market for centralized mainframe printers (typically found in data centers) by repurchasing secondhand machines, refurbishing them, and reselling them to very price-sensitive targeted accounts.

References

- Argote, L., P. Ingram. 2000. Knowledge transfer: A basis for the competitive advantage in firms. *Organ. Behav. Hum. Decision Proces.* **82**(1) 150–169.
- Armenakis, A. A., S. G. Harris. 2002. Crafting a change message to create transformational readiness. *J. Organ. Change Management* **15**(2) 169–183.
- Baden-Fuller, C., S. Winter. 2007. Replicating knowledge practices: Principles or templates? Working paper, Cass Business School, City University, London, UK.
- Barlow, D. H., M. Hersen. 1984. *Single Case Experimental Designs: Strategies for Studying Behavior Change*, 2nd ed. Pergamon Press, New York.
- Bartlett, C. A., S. Ghoshal. 1989. *Managing Across Borders: The Transnational Solution*. Harvard Business School Press, Boston, MA.
- Bradach, J. L. 1998. *Franchise Organizations*. Harvard Business School Press, Boston, MA.
- Camp, R. C. 1989. *Benchmarking: The Search for Industry Best Practices That Lead to Superior Performance*. ASQC Quality Press, Milwaukee, WI.
- Cook, T. D. 1991. Clarifying the warrant for generalized causal inferences in quasi-experimentation. M. W. McLaughlin, D. C. Phillips, eds. *Evaluation and Education: At Quarter Century: Ninetieth Yearbook of the National Society for the Study of Education*. University of Chicago Press, Chicago, IL, 115–145.
- Cook, T. D., D. T. Campbell. 1979. *Quasi-Experimentation: Design & Analysis Issues for Field Settings*. Houghton Mifflin, Boston, MA.
- Cook, T. D., D. T. Campbell, L. Peracchio. 1990. Quasi experimentation. M. D. Dunnette, L. M. Hough, eds. *Handbook of Industrial and Organizational Psychology*. Consulting Psychologists Press, Palo Alto, CA, 491–576.
- Ingram, P., J. A. C. Baum. 1997. Opportunity and constraint: Organizations' learning from the operating and competitive experience of industries. *Strategic Management J.* **18** 75–98.
- Jensen, R. J., G. Szulanski. 2004. Stickiness and the adaptation of cross-border knowledge transfers. *J. Internat. Bus. Stud.* **35**(6) 508–523.
- Kogut, B., U. Zander. 1992. Knowledge of the firm, combinative capabilities and the replication of technology. *Organ. Sci.* **3**(3) 383–397.
- Kostova, T. 1999. Transnational transfer of strategic organizational practices: A contextual perspective. *Acad. Management Rev.* **24**(2) 308–324.
- Kostova, T., S. Zaheer. 1999. Organizational legitimacy under conditions of complexity: The case of the multinational enterprise. *Acad. Management Rev.* **45**(1) 215–233.
- Lippman, S. A., R. P. Rumelt. 1982. Uncertain imitability: An analysis of interfirm differences in efficiency under competition. *Bell J. Econom.* **13**(2) 418–438.
- MacDuffie, J. P. 1995. Human resource bundles and manufacturing performance: Organizational logic and flexible production systems in the world auto industry. *Indust. Labor Rel. Rev.* **48** 197–221.
- Nelson, R., S. Winter. 1982. *An Evolutionary Theory of Economic Change*. Belknap Press, Cambridge, MA.
- O'Dell, C. S., C. J. Grayson, N. Essaiades. 1998. *If Only We Knew What We Know: The Transfer of Internal Knowledge and Best Practice*. Free Press, New York.
- Oxford English Dictionary*, 2nd ed. 1989. Clarendon Press, Oxford, UK.
- Polanyi, M. 1962. *Personal Knowledge: Towards a Post-Critical Philosophy*. Chicago University Press, Chicago, IL.
- Prahalad, C. K., Y. L. Doz. 1987. *The Multinational Mission: Balancing Local Demands and Global Vision*. Free Press, New York.
- Rivkin, J. W. 2000. Imitation of complex strategies. *Management Sci.* **46**(6) 824–844.
- Rivkin, J. W. 2001. Reproducing knowledge: Replication without imitation at moderate complexity. *Organ. Sci.* **12**(3) 274–293.
- Shadish, W. R., T. D. Cook, D. T. Campbell. 2002. *Experimental and Quasi-Experimental Designs for Generalized Causal Inference*. Houghton Mifflin, Boston, MA.

- Stewart, T. 1996. Beat the budget and astound your CEO. *Fortune* (October 28) 187–188.
- Szulanski, G., M. V. Casaburi. 2004a. Rank Xerox (B): Is “Tele-marketing” the answer? Case Study, INSEAD, Fontainebleau, France.
- Szulanski, G., M. V. Casaburi. 2004b. Rank Xerox (C): The success of telesales. Case Study, INSEAD, Fontainebleau, France.
- Szulanski, G., R. J. Jensen. 2006. Presumptive adaptation and the effectiveness of knowledge transfer. *Strategic Management J.* 27(10) 937–957.
- Szulanski, G., G. Deutsch, J. Fueyo, M. V. Casaburi. 2004. Rank Xerox (A): Global transfer of best practices. Case Study, INSEAD, Fontainebleau, France.
- Teece, D. J. 1998. Capturing value from knowledge assets: The new economy, markets for know-how, and intangible assets. *Calif. Management Rev.* 40(3) 55–79.
- Teece, D., G. Pisano, A. Shuen. 1997. Dynamic capabilities and strategic management. *Strategic Management J.* 18(7) 509–533.
- Trochim, W. M. K. 2001. *The Research Methods Knowledge Base*. Atomic Dog Publishing, Cincinnati, OH.
- Winter, S. G. 1995. Four Rs of profitability: Rents, resources, routines and replication. C. A. Montgomery, ed. *Resource-Based and Evolutionary Theories of the Firm: Towards Synthesis*. Kluwer Academic Publishers, Norwell, MA, 147–178.
- Winter, S. G., G. Szulanski. 2001. Replication as strategy. *Organ. Sci.* 12(6) 730–743.
- Yin, R. K. 1989. *Case Study Research*. Sage, Newbury Park, CA.
- Zander, U., B. Kogut. 1995. Knowledge and the speed of the transfer and imitation of organizational capabilities: An empirical test. *Organ. Sci.* 6(1) 76–92.
- Zbaracki, M. J. 1998. The rhetoric and reality of total quality management. *Admin. Sci. Quart.* 43(3) 602–636.