

**The Travel Project
at
Space Telescope Science Institute**

A Case Study Focused on User Values

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The Travel Project

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The Travel Project

Purpose/Overview:

The *Travel Project* is a cooperative project between the STScI Administration Division and Development, Technology & Innovation. There were many motivations underlying the project, the clearest and most basic was that the Travel Office of STScI experienced first hand that the methods used to responding to travel requests and providing travel services to staff, though functional, appeared to have many attributes that could be automated, improved and lead to less aggravation. The Travel Office personnel and the Administration Division were keenly interested to improve this relatively innocuous process so that Travel Office personnel could undertake other, more valuable projects and services that would benefit STScI and its user community.

Other motivations include
Improved customer services

Admin Division desires to improve services – the travel process appeared to be manageable service to examine (scope, timeliness), as opposed to the full suite of processes to examine

Innovative process improvement method

DTI wished to test an innovative process improvement methodology (*Lean Thinking*) that is a disciplined approach to incrementally or, more often, radically improving processes with the explicit goal to free up personnel to engage in more fruitful, valuable work (c.,f., www.lean.com)

New responsibilities

Travel Office personnel wished to take on new responsibilities – visitor travel and coordination, meeting coordination, etc. to participate in STScI's strategic goal to be a viable research and technology institute

Other organizational needs

The Travel Office and Admin in general wished to re-allocate time to other organizational needs. T.O. identified a patchwork solution to adopt new software to enable users to specify specific flights for travel needs

Systemic Approach

Admin and DTI realized that patchwork solutions on processes had been applied before and desired to take a systemic approach to examine the entire process, including the ramifications of a new software resource inserted into the “middle” of the process

Policing of processes

Admin and the T.O. in particular can no longer afford to provide the “policing” function for STScI. Good management practices were desired as an more optimal method for conducting business

Responding to evidence

Hearsay evidence indicated that the travel process included many tasks that induced time delays, considerable confusion and frustration for travelers and managers.

Disjointed processes

The individual parts of the existing process were known to be completely independent – leave requests, travel planning, calendar coordination, expense reporting, and accounting

DESIRED OUTCOME

We wish to achieve improvement in the current travel process, eliminating barriers and unnecessary work that inhibits prompt execution of travel arrangements. Administration Division wishes to realize an improved focus on service to users / customers. An additional project aspiration is to make conference, symposium and visitor travel arrangements a robust service, thereby enhancing STScI's stature as a center for scientific and technical discourse on space science. We also desired to adopt an improvement methodology that would be adapted across the Institute in administrative, executive, technical and science divisions.

The input parameters (outcomes, motivations) led us to adopt an aggressive improvement methodology. We decided to experiment with a new innovative process created largely for commercial enterprises involved in manufacturing and product delivery. We were confident that we could adapt the methodology to our service related purpose. We each have extensive experience with a variety of process improvement methods and could draw upon those principles as well.

The process we adopted is called *Lean Thinking* (LT, c.f., Womak and Jones [1] and www.lean.com). We intended to experiment with this method to see how it contrasted with other scenarios. Basically, the LT method focuses on delivering to users products and services that they value highly. The method has a positive attribute that it helps to identify innovative solutions that enhance the user's work or productivity because it probes not only user desires and needs, but also the manner in which individuals accomplish tasks. The methodology also is purported to identify scenarios that would result in less waste and time for human resources to concentrate on more sophisticated value added tasks.

The method was not adopted to reduce personnel in Administration, nor is that the core precept of LT.

CHALLENGES

We realized at the outset that the challenges within the Institute to revamp a process would be formidable. We chose the Travel Process because we hoped that travel was a not a contentious issue and that efforts to reduce paperwork, delays, aggravation, frustration, inefficiency and cost of travel would be welcome. We adopted an aggressive schedule for deployment. However, we did know that acceptance by managers could be a hurdle. According to Wilson [2], the greater the diversity of the organization, the smaller the proportion of change or innovation proposals that will be adopted.

Project Timeline / Process Description

Date (2000)	Process & Tasks
August	Choose a process improvement method: " <i>Lean Thinking</i> "
Early September	Identify Customers <ul style="list-style-type: none">○ Review list
Mid-September	Prepare interview materials <ul style="list-style-type: none">○ Travel specific questions○ Generic process questions○ Construct a method to document "how users work"
3 rd week of September	Initiate interviews
Mid -October	Finish interviews
Mid-October	Compile interviews and collage <i>user values</i>
Late October	Define Current Flow <ul style="list-style-type: none">○ Trace the "travel idea" through completion of expense report○ Examine the logic of the processes○ Examine process execution, efficiency and rationale of each activity○ Identify steps of value to the traveler Map IDEAL Flow
	Compare Ideal Flow to Current Flow
	Identify areas that can be pruned (aggressively)
Mid November	Describe and document the leanest flow – specify user values, specify timeline
	Define method for users to "pull" product and services (it is already?)
	Identify additional data required
December	Identify the solutions Define optimized flow, document additional requirements from intermediary customers and stakeholders Identify products and resources required to implement the revised process Identify changes, policies and procedures
January 2001	Briefing on concept and top level implementation
February 2001	Debrief from management input
March-April 2001	Determine implementation, identify technical issues

Interview Process

The purpose of the user interviews is designed to probe how people work. Surveys and prescribed questions can provide useful information about particular products and services, but to create innovative solutions, the designer needs critical insight into how people work. The optimal way to determine usability of a product or service is to watch individuals performing their routine tasks. Critical review of the operations used can demonstrate clearly what assumptions are made, how individuals work around problems, what pre-conceptions are present and what difficulties are encountered with the existing product.

Since we could not videotape travelers during the travel process, that is, from travel idea through completion of the expense form, we asked users to describe their actions step-by-step. Travelers were informed before the interview started regarding how our analysis would proceed and what data we needed. They understood clearly the videotape concept and were most cooperative and helpful in detailing their actions for us.

We also interviewed various administrative and management personnel regarding their actions related to travel. The interview topics were thus modified accordingly ("Describe the types of trips you arrange for employees of the Institute? What do you do? When are you first informed of a travel idea?, etc.).

QUESTIONS: HOW USERS WORK

1. Describe the types of travel you take as an employee of STScI
 - 1.1. Specifics
 - 1.1.1. Foreign or Domestic Travel
 - 1.1.2. Functional, Observing, Training/Seminars
 - 1.1.3. Routine trips with advanced warning or last minute need
2. Describe how you go about arranging for you trips
 - 2.1. Specific topics
 - 2.1.1. What steps do you take?
 - 2.1.2. Who do you talk to about your trip in order to arrange it?
 - 2.1.3. Do you travel with other STScI employees?
 - 2.1.4. Do you care whether you travel/stay with other STScI folks?
3. Describe the situation when the arrangements go smoothly. What factors make you feel that the travel preparations are going smoothly?
4. After filing a request for travel, what response time would meet your expectations?
5. What, if anything, prevents you from confirming reservations prior to the airline's 24-hour cancellation?
6. What factors would make your travel go more smoothly?
7. What do you value most regarding travel arrangements?
 - 7.1. Specifics
 - 7.1.1. saves time,
 - 7.1.2. flexibility in scheduling
 - 7.1.3. ability to make decisions at last minute,
 - 7.1.4. someone else takes care of all the details,
 - 7.1.5. desire to find most convenient travel by myself,
 - 7.1.6. no signatures, have a set travel pool, ...etc.?
 - 7.1.7. use online services
 - 7.1.8. have online records
 - 7.1.9. use online signatures/approvals/communication
8. Can you relate an experience of arranging travel through another Institution that was notably positive?
 - 8.1. Notably negative?
9. What makes travel expense reimbursement go smoothly?
 - 9.1. Specifics
 - 9.1.1. easy to submit expense form,

- 9.1.2. have a per diem rate,
 - 9.1.3. have someone else figure it out,
 - 9.1.4. use online forms,
 - 9.1.5. direct deposit, etc.
10. Despite our knowing a trip is upcoming, we often procrastinate in requesting travel. What event or events typically prompt you into formally requesting the travel?
 11. Off the top of your head, name 5 things that would constitute successful travel, from the travel idea through receipt of reimbursement.
 12. Do you participate in organizing incoming attendees to STScI meetings? What problems do you encounter?
 13. What experiences have you had using Virtuallythere.com?
 14. If you use online travel reservation services, which features do you find useful?
 - 14.1. Specific services used
 - 14.1.1. Specific services desired- if online, what % of trips would you book that way?
 - 14.1.2. Services needed by persons arranging travel for someone else

PERSONNEL INTERVIEWED

1. Travelers
 - 1.1. Scientific staff
 - 1.1.1. Tenure track
 - 1.1.2. Scientist track
 - 1.1.3. Tenured (only one respondent)
2. Technical staff
Note few travel extensively, however travelers with particular problems, requests and situations were selected
3. DIVAS including individuals with visitor and conference experience
4. Supervisors and Division Heads

Many interviewees were frequent travelers but several infrequent travelers were interviewed also.

Interviewees were selected by Travel Office, based on past experience and travel histories.

Some additional discussions were held informally with other travelers.

DURATION / NATURE OF INTERVIEWS

An average of one hour was devoted to each interview. The interview was structured, and little time was devoted to "complaints". Time at the end of each interview was allotted for unstructured comments and suggestions. All interviewees were very positive in their responses and constructive in their suggestions.

Interview Results: User Values

The responses given during interviews were recorded and then later collected into groups of *key user values* in the following Table. User values are the basis or criteria for analyzing an appropriate process flow.

Table 1: Traveler User Values

Key Value	Detail	Additional Notes
Lowest Cost	<p>Some users are willing to hunt for fares and also check daily for optimal fares to get the best deal.</p> <p>Most grant holders are especially concerned to get the lowest cost. Many use online facilities to find low fares.</p> <p>Cost conscious users want to book travel only when they are satisfied they have the lowest fare. These individuals tend to be those with grants or some other input/ control over /responsibility for travel budgets.</p> <p>Some manager/travelers who manage their budgets closely care about low cost fares, but do not want to find the fares themselves.</p> <p>Some travelers would book travel on their own credit cards to save money (and time), if they believed STScI policy would allow such action.</p>	<p>The SW solution we adopt must allow the user to constrain cost as an option.</p> <p>Admin documents cases where users request itineraries with higher fares than those suggested by the travel office. However the reverse statistic is undocumented, but does occur. Many users reported that they have found low fares, but lost them due to the TA process delay.</p> <p>Other organizations allow this, even those funded by NASA.</p>
Timeliness	<p>Users report there is often a long delay (days) in responding to suggested bookings and fares (fare may have expired, for example)</p> <p>Travelers, DIVAS and managers report that time delays sometimes are due to the TA signoff process and routing as a paper process and handling by many individuals including intermediaries.</p> <p>Most travelers desire the itinerary to be available online, electronically (e.g., entered in Personal Organizer – Palm) or in hardcopy promptly rather than held with tickets. Travelers who wish to have itineraries in hard copy are happy to print from an online source.</p>	
Empowerment /control	<p>Travelers, especially frugal travelers and frequent travelers, want ability to book fares promptly. Travelers would like pre-approved specific or generic travel trips (e.g., a travel plan) or budget authority /responsibility pre-allocated.</p> <p>Many users want to weigh cost-benefit of fare, schedule, convenience rather than being restricted only to fare. The travelers who articulated these views are frequent travelers, often traveling on trips required by functional responsibilities or on science travel.</p> <p>Some users want complete control over their travel,</p>	<p>Divisions in which a yearly travel plan is constructed and occasionally revised have a very straightforward method of tracking travel and articulated only a need to be notified that a particular trip in the travel plan is being executed, since the travel plan is considered an approval for travel.</p>

	<p>with little or no interaction with the travel office. Their experience is that they can find fares, book, get inexpensive accommodations and book cars efficiently and online. Many of these travelers change the travel arrangements after the initial reservations have been made.</p> <p>Users who value empowerment do not value iterating travel arrangements with the travel office because it is time consuming and inefficient.</p> <p>Early selection of seats is an important part of the travel arrangements and service.</p> <p>Individuals who travel regularly desire flexibility to choose type of service, e.g., coordinating with other travelers or not sharing travel information with others, based in individual preferences. These travelers prefer to choose when to share travel information.</p> <p>Travelers value flexibility in types of arrangements (direct flights, arrival times, types of travel arrangements (car, taxi, hotel), etc.)</p> <p>Administrative assistants & DIVAS value that the travel office provides a good service and would value a process where employees are empowered to make their own arrangements.</p> <p>DIVAS would not value the responsibility to make travel arrangements for personnel in their divisions.</p>	
Hotel/car service	<p>Most but not all travelers value the travel office arranging hotels and car most of the time, but not all of the time.</p> <p>Some exceptions exist regarding the travel service...usually in pre-arranged conferences and collaborations. Having additional personnel (secretaries, DIVAS and travel office) often requires more time on the part of the Traveler.</p> <p>Would like to have visibility into various local transportation options – is it easy to get a taxi or metro? Is car parking difficult? Is a car recommended? Are lots of co-travelers getting cars?</p>	Some of these services cannot be provided now since the travel office is handling the more routine paperwork and interactions with travelers.
Efficient Reimbursement	<p>All travelers value the rapid reimbursement provided by STScI.</p> <p>Some users want to expend less effort in filling out the travel expense report. These users value simplicity. Some users have reported experience with travel processes funded by outside sources, including those funded by NASA that require less documentation than STScI does.</p>	

	<p>Travelers want to submit the electronic form directly, not a paper form. These travelers believe that some electronic signature or electronic approval (e.g., email) should be sufficient to authorize reimbursement.</p> <p>Direct deposit was advocated by many users and these individuals agree to wait more than 3 days (the nominal check issue period) to receive the deposit would be worth it to avoid handling checks. Many frequent travelers hold issued checks anyway until it is convenient to go to the bank.</p> <p>Visitors and hosts find completion of TE cumbersome, and usually need individualized help.</p>	
Per diem/ meal reimbursement	<p>In general, travelers felt meal per diem is too low</p> <p>Hotel costs vary too much for a per diem to make sense to travelers. Often the recommended conference hotel is more than the per diem. A few travelers have reported prior incidents of being booked into hotels by the travel in unsavory areas or at large distances from their destination in order to reduce cost. (This was not a common occurrence however).</p>	
Convenience	<p>Some traveler /managers wish to spend as little time as possible working on travel arrangements. They usually wish to have the travel office or DIVAS make the travel arrangements. These travelers value “good service” rather than empowerment and control over their arrangements.</p> <p>Exceptions are traveler/managers who place a higher value on empowerment and use existing online services (e.g., Travelocity) or investigate through other means (printed schedules, phone) to create preferred bookings for the travel office.</p> <p>Separate credit card might be helpful for certain Travelers to keep expenses separate.</p> <p>Travel advances are valued by some travelers.</p> <p>Some personal attention and support with traveler control over complex travel arrangements is valued to streamline number of stops, travel times, and general logistics of a complex trip.</p> <p>Travelers in general place a high value on:</p> <ul style="list-style-type: none"> o Electronic communication, signatures, conducting business online, etc. o One stop shopping for travelers (online) o One stop shopping for visitors (online) o Reminders for deadlines - especially for meetings far in advance, e.g., AAS 	<p>Our recommendations must accommodate these two opposed values – some want empowerment, others prefer service. Travelers may value different things for different trips.</p> <p>Would use of DIVA credit cards help here?</p> <p>Services such as reminders, complex travel and greater visibility into visitors and local conference arrangements is additional work that the travel office cannot offer without freeing up time spent on current activities.</p> <p>Double checking travel arrangements is not a service easily provided by the travel office now (resource limitation)</p>

	<ul style="list-style-type: none"> ○ Someone else worries about STScI policy constraints, the traveler does not – an online system that incorporates “rules” and policies in a consistent way is valued ○ A robust method for insuring accuracy of arrangements (sometimes this does not occur) 	
User preferences	<p>Many travelers value a user profile as a default.</p> <p>Travelers would greatly value that repetitive and generic information (user name, Employee ID, OBS, etc.) and other preferences can be stored online so they do not have to be written out on paper requests or expense forms.</p>	
Off hours lifeline	<p>A few users value the off hours support - usually for travelers with numerous connections and who travel a lot.</p> <p>Current system works in the infrequent cases when it has been needed.</p>	
Travel Authorizations	<p>For most scientist travelers there was no apparent value attached to the TA. The TA was only useful to alert travel office of an intended trip, and users strongly felt that email or an online service would work better and provide other desired and valued attributes. Most scientists travel either on their own science research or for required functional work – e.g., most of their travel is budgeted (either in dollars or in trips – for example <i>N</i> trips to Ball Aerospace for calibration) and in a sense, approved <i>a priori</i> for each Fiscal Year.</p> <p>Routing of the TA is not visible (where is it?). Travelers repeatedly reported frustration and lost time in tracking the TA. If the TA process is to be retained, Travelers would want something like the FedEx tracking service to know where the authorization is.</p> <p>Many travelers end run the TA process and communicate directly with the travel office to get the booking process started, as documented above.</p> <p>Some users think that the TA is fulfilling the calendar coordination need within divisions because they perceive that the TA notifies supervisors and division heads when individuals are to be away. In fact, further investigation showed that this was not the usual case in divisions and was not the preferred way for employees to communicate with their supervisors.</p> <p>Some managers think other supervisors might be using the TA for calendar information & budget control. Further investigation showed that while a TA may alert a division or department that a trip is taking place, the TA does not provide any budget control, since trip costs are unknown ahead of time.</p>	<p>The leave form, not the TA, should be used for the calendar function. Any solution we recommend should be able to communicate with the leave database.</p> <p>In addition, travelers should communicate with supervisors about periods of travel planned. This varies with division however. There is no systemic method being used to alert supervisors, colleagues and divisions of</p>

Value Assessment Findings

TRAVELERS

Travelers' behavior and preferences vary widely, but can be grouped into broad categories:

- Many travelers would value a system based on electronic communication and online services.
- Cost conscious travelers believe they can find the lowest travel fares and arrangements and prefer to search for and book the optimal arrangements. They believe it is more efficient and cost effective to do so.
- Travelers who value control over their travel, with little or no interaction with the travel office, have experienced that they can find fares and other arrangements that they believe are optimal for their situation. (in addition to cost other factors such as convenience and personal preferences)
- Travelers would value a system that stores preferences and pertinent numbers, policies, and other necessary and repetitive information.
- Travelers who value empowerment would value a system without the current TA delays and one in which the time lost due to iterations with the travel office is eliminated (since they would make the arrangements themselves).
- Some travelers value a good travel service more than empowerment, because someone else spends the time making the travel arrangements. These travelers accept time delays and do not perceive the process as inefficient because they spend no time on the process (someone else does). Most travelers want some control over their travel arrangements, however.
- Many travelers or the individuals they task to initiate travel arrangements have learned to expedite their travel arrangements by sending email and FAXes to the travel office. This helps relieve the TA process delays.
- Many frequent travelers have complex value systems that feed into the decision making process regarding the acceptability of travel arrangements. These include, departure and arrival times, professional commitments, personal commitments, seat selection, overbooking, airline history, connection hub congestion and convenience, weather, and other factors that can be parametrized to first order. However second order more intuitive preferences are not easily factored or conveyed to and implemented by a third party such as the travel office.
- Travelers wish to have expense reports (and all other pertinent information and processes) linked to travel requests, and wish to have most of this information online and/or electronically transmitted.
- Travelers would value a system where the trip information resided on line and progress in arrangements could be visible, itineraries available promptly. Travelers would like to choose who to share the information with.
- Travelers would value ancillary processes spawned automatically from their requests, that they currently spend time on doing by hand or having someone else do. Examples include, leave requests, calendar coordination, budget checking, etc.

TRAVEL OFFICE

The travel office itself does not have a requirement for the items listed below. The office has been put in the position of monitoring adherence to policy, but it does not need to fulfill that function in order to make travel arrangements in a timely, cost effective and efficient manner that also serves traveler needs.

- Policing trip authorization (management responsibility)
- Policing sufficient funding for travel (management responsibility/ budget authority)
- Appropriate charge numbers (Institute accounting)
- Calendar coordination within divisions (management responsibility)

The office would value a Trip tracking number or identification number.

The office desires the opportunity to provide better services, expand capabilities (conference coordination, group travel etc.) by streamlining the travel process and empowering some travelers to make arrangements themselves should they choose to.

TRAVEL AUTHORIZATION USAGE

Uses perceived by Travelers

The TA signifies that someone with signature authority has signed off on the trip	True
The travel office requires the signature	By current policy external to the travel office – the Travel Office has no internal requirement for the signature
Auditors or GSFC require the signature	Auditors need some evidence that travel is controlled in some fashion. Travel plans and signatures on travel expense forms are sufficient. GSFC requires evidence that travel is planned and executed according to an authorized plan.
Supervisors know from the TA that a traveler will be away in a specified period	Rarely is the TA used for this purpose. Leave request online forms serve this purpose, although an online travel system could feed the leave database just as easily
Supervisors coordinate work around information on the TA	Not true
The TA is the way to demonstrate a trip is being conducted for official business	True, but it is not the only way possible
Verifies that budget is available for travel	Only for grants

Perceived uses by divisions

Controls travel costs	Not true , only the expense form does this. In travel planning many travelers are finding lower fares but cannot acquire them due to delays in the TA process.
Controls all aspects of travel	Not true , usually used only as the first approximation for travel dates and travel destination
Serves a calendar coordination function	Rarely used for this purpose- Leave request forms online serve this purpose. The leave database can be fed from any online service as required
External auditors need TA forms signed	Not true . Auditors need to see some planning and authorization/control but not at the extent it is currently implemented
The TA, travel planning, reporting, etc. is uniform now across all divisions	Not true . Different divisions have different methodologies, cultures and procedures.

We acknowledge that other perceptions and impressions are present.

We discovered that the actual usage of TAs in divisions, departments, branches, and teams varied widely.

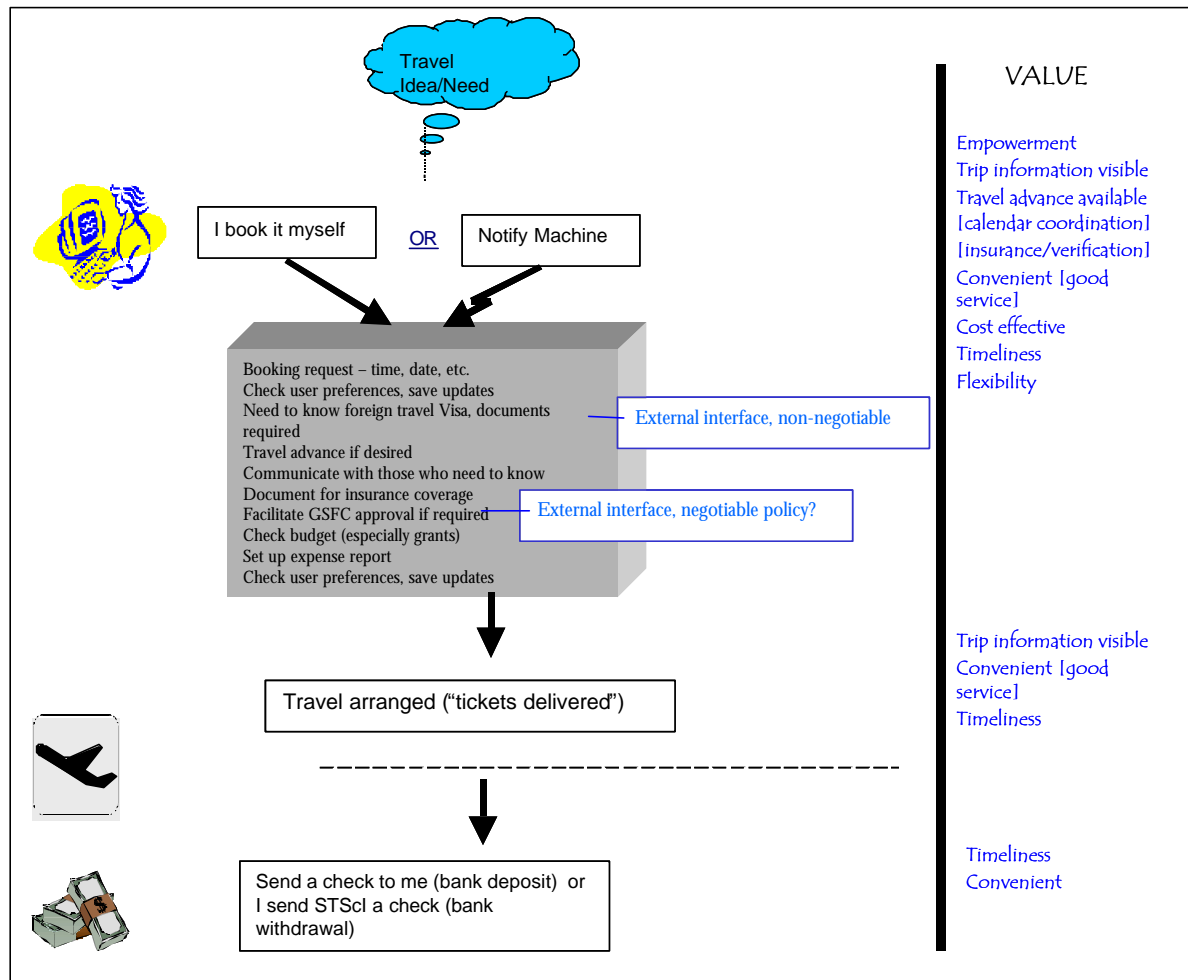
Travel Procedures Flows

THE IDEAL FLOW

The ideal flow for the travel process is to deliver to the traveler the most valued services and products. Ancillary products, services and constraints should be eliminated, minimized or made completely transparent to the traveler. The ideal process produces *no barriers* to delivery of value to the traveler. Furthermore, every activity in the flow contributes to delivery of value. Individuals and processes (hopefully many automated) should be visibly contributing to accelerating the flow rather than creating restrictions or diversion to delivery.

Figure 1 illustrates the most straightforward idealized flow to deliver user values. The critical user values are elucidated in the figure. The ideal flow is derived from the previous sections of this document that discuss user values in detail.

Essentially the traveler formulates the trip requirements, complete with personal preferences and individual constraints. Either the traveler makes his/her own arrangements, or a designee, who is familiar with the travelers preferences and constraints arranges the trip. The trip is arranged in a timely fashion with the ability to make adjustments (flexibility), obtain the best fares and most convenient schedules. Arrangements are delivered electronically or in paper form, according to traveler preference.



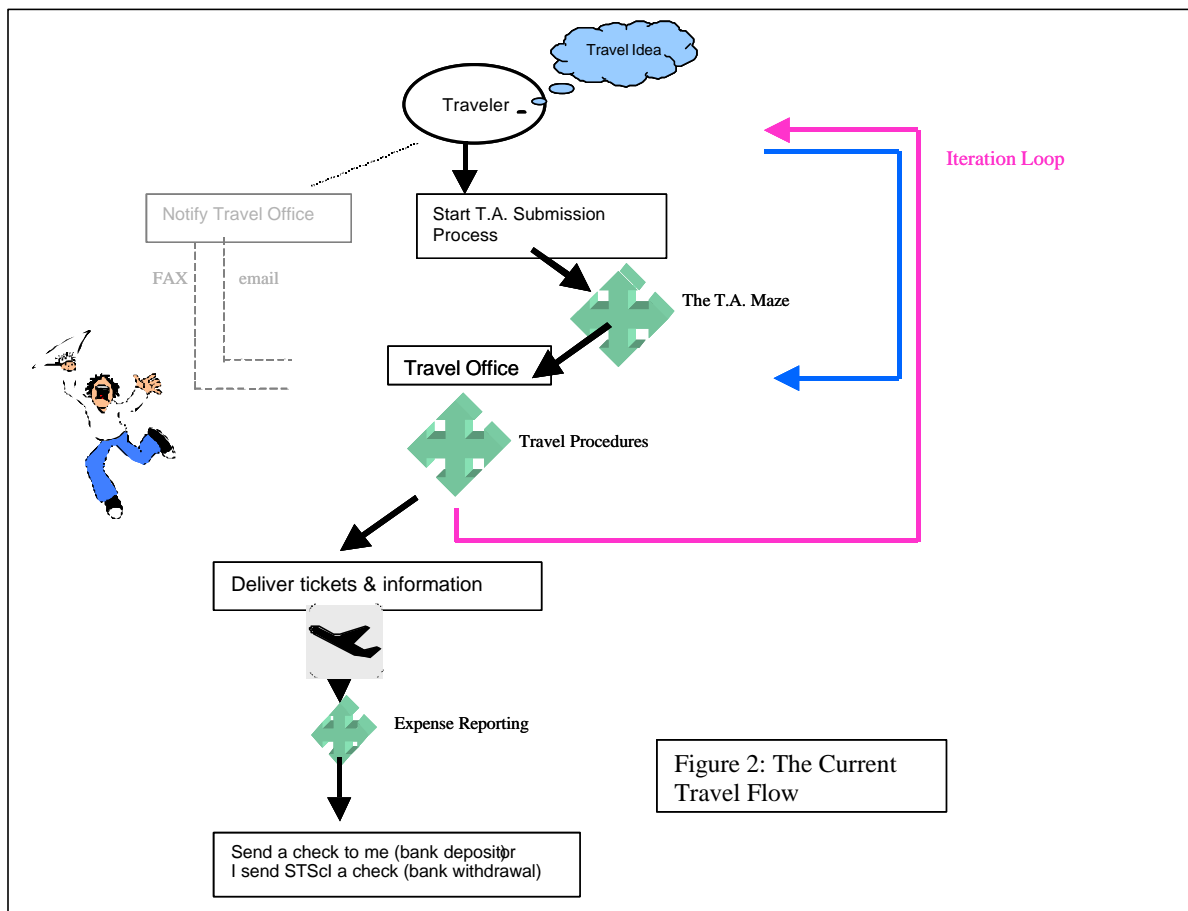
One important facet of the flow is timeliness. Long delays and lost communications are eliminated in the ideal flow. Every individual (budget managers, supervisors, division heads) and processes (calendar managers, leave request forms) are notified automatically regarding the trip. Information can be exchanged with other travelers at the individual's preference.

Several additional, external interfaces still require human services to complete. These are due to external constraints on the STScl travel system and on travelers in general. The first constraint is that some trips, for example international travel, require GSFC approval. Until that external constraint can be negotiated out of our system, such approvals will require human intervention. This approval requirement can constitute a barrier to the traveler if it is not obtained in a timely fashion.

Another constraint is visa requirements for foreign travel. There is no simple way to remove this barrier, although some countries (e.g., Australia) have made the procurement of visas a simple and relatively automated process integrated into air travel arrangements.

STEPS IN CURRENT FLOW

The current flow for travel initiates with a travel idea, for functional or research work, as shown in Figure 2. The traveler initiates the current *Travel Authorization Submission Process* in order to obtain approval for the trip. The TA, being a paper product, is inserted into a loop to complete the TA information. Eventually the TA arrives in the Travel Office.



Travelers and the Travel Office have identified that many travelers have learned to circumvent the TA submission process by submitting travel information directly to the Travel Office. It is difficult to track down

where the TA is at any moment, but the traveler and the Travel Office work on the assumption that the paper product will indeed arrive at the office. The processing of the TA is diagrammed in detail in Figure 3 and 4.

The Travel Office iterates the arrangements with the traveler, and also submits the travel information into a travel procedures loop, shown in Figure 5. Once all processes are completed, the travel arrangements, usually in the form of tickets and an itinerary, are delivered to the traveler.

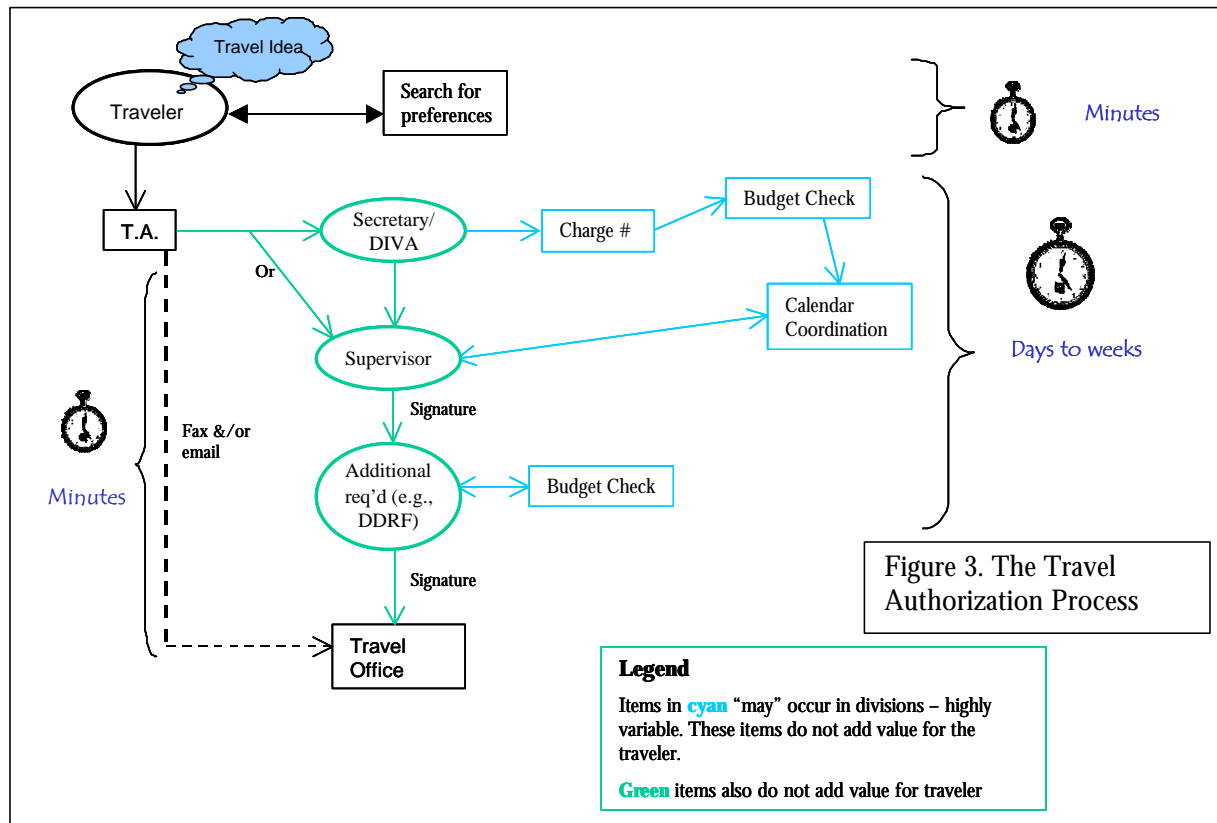
Upon completion of the trip, the traveler submits an expense form for reimbursement or payment to STScI. Unfortunately, this expense form is in no way linked to the TA except *via* memory and records in Accounting.

The Travel Authorization Step: Flow and Timing

Many travelers do some initial checking for the possible routings and itinerary. This activity occurs frequently with the advent of many travel planning web pages including individual airline pages and Travelocity.com. The Travel Office reported at the beginning of this project, that many travelers provide very specific information regarding travel arrangements either on the TA, in ancillary email or attached printouts.

Often travelers provide optimal fare information, but the TA process itself prohibits responsive action to such opportunities because the paper product is not present in the Travel Office yet. Therefore travelers provide detailed information to the Travel Office within minutes of deciding to make a trip.

The paper product is submitted to a supervisor, a DivA or a secretary for handling. Large delays can occur depending upon the load of signatories and the logistics of finding appropriate charge numbers, as well as the inter-office mail. Only TAs that are “walked through” by hand are successfully delivered to the Travel Office in a timely fashion.



During this step, budgets are checked. Except for grant holders, this step is either redundant or unnecessary. In some divisions, the travel budgets are planned in advance, and so the TA is only a mechanism to alert the budget manager to “check off” the trip in the plan. In divisions where such planning is not as tightly developed, the TA is only loosely coupled to budget monitoring.

The TA could serve as a calendar coordination tool or at least an advisory tool for supervisors, but in order to do so, information must be transferred from the paper product by hand, to a calendar tool, the leave request system or email for division/group planning.

It has been demonstrated that the budget checking, charge code checking and iteration with divisional representatives (DivAs, division heads, team leads, etc.) can lead to significant delays in TA processing since the paper product is produced manually and subject to errors and misinterpretation.

Additional checks for trips that are split between charge codes (cost centers) such as grants, DDRF and functional work induce further delays. There is no guarantee that the travel expense report will reflect the information on the TA however.

Figure 3 illustrates the areas where variances between divisions and groups occur. That is, handling of travel information is quite diverse across the Institute. No two divisions handle travel in precisely the same way.

Time Spent (Level of effort)

?? Iterations

- Average number of iterations is 3 per trip. This requires about 1 hour of travel office time and .5 hour traveler time. For some travelers, additional time is spent by DivA's or administrative assistants in handling and re-handling paperwork.
- The level of effort is interrupt driven, disrupting ongoing work.
- Elapsed time for iterations can be 2 or more days, requiring personnel to review prior work and catch up to the current state before proceeding.
- Additional changes to arrangements may be made at the last minute by traveler, administrative support or travel office (0.25-0.5 hour)

?? Travel Authorization creation, tracking, completion

- Traveler may spend up to .25 hour on completion
- Administrative support or travelers spends 0.25 on additional completion, WBS lookup, obtaining signatures
- Travelers and administrative support may spend additional 0.25-.5 hour tracking T.A.

Travel Authorization Process: Traveler Values

Figure 4 illustrates the various steps in the travel authorization flow that offer value directly to the traveler. Clearly travelers who find their own travel itineraries and fares feel in control of the process and are easily able to weight all their preferences and requirements against the available arrangements. This is valued highly for frequent travelers. Neither the Travel Office, nor DivAs nor secretaries can hope to understand or duplicate all of the preferences that an individual traveler values.

Traveler preferences are important in that travelers are more efficient, and can be more productive if travel planning can be integrated into their functional, research and personal needs and requirements.

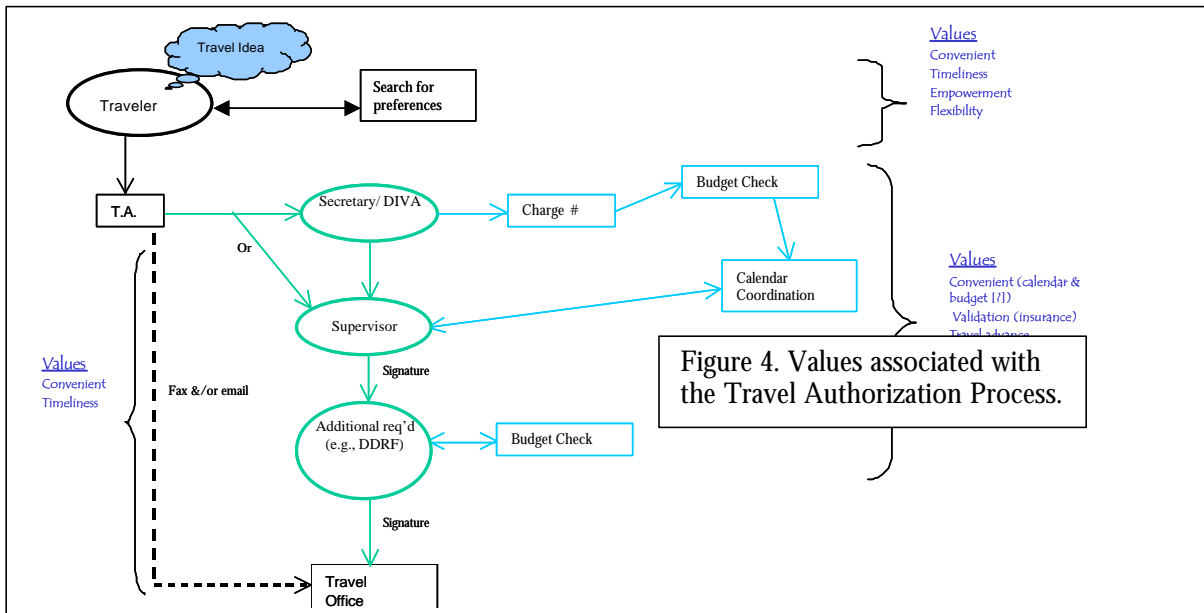


Figure 4. Values associated with the Travel Authorization Process.

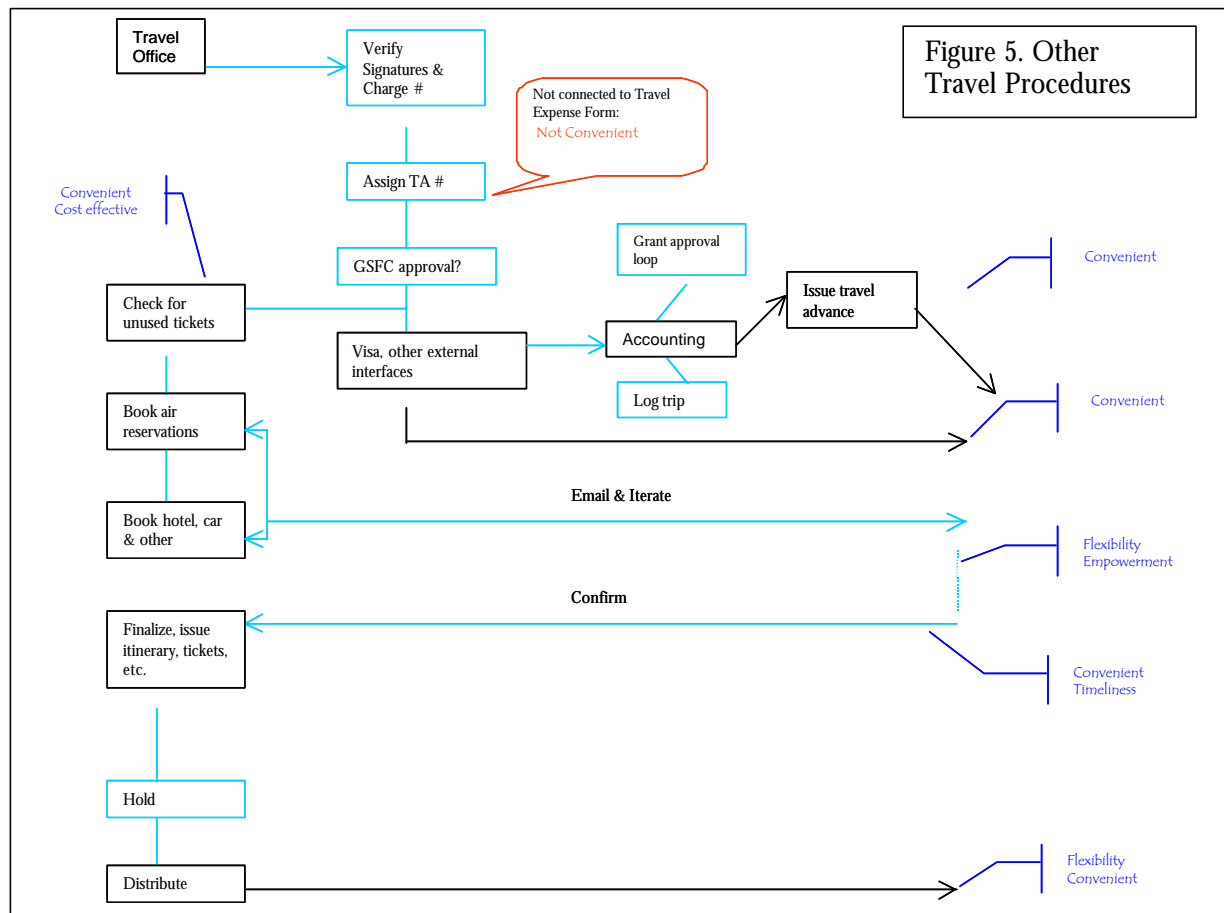
The upfront processes of searching for options is valued by travelers for the flexibility, convenience and timeliness of the arrangements. Many travelers, especially responsible for their own budgets (grants or team budgets), value the opportunity to identify low fares.

The services (ticketing, etc.) by the Travel Office are valued by travelers, although electronic ticketing has reduced the necessity for paper transaction records. Travelers also feel that the TA is a paper validation of the trip and therefore provides some insurance protection. Clearly other methods of documenting trip validity are possible.

Clearly all of the intermediate steps in the Travel Authorization process offer little value to the traveler. Simple notification mechanisms would suffice. The challenge for the travel project is to understand if the many steps in the TA process really are required.

Travel Procedures

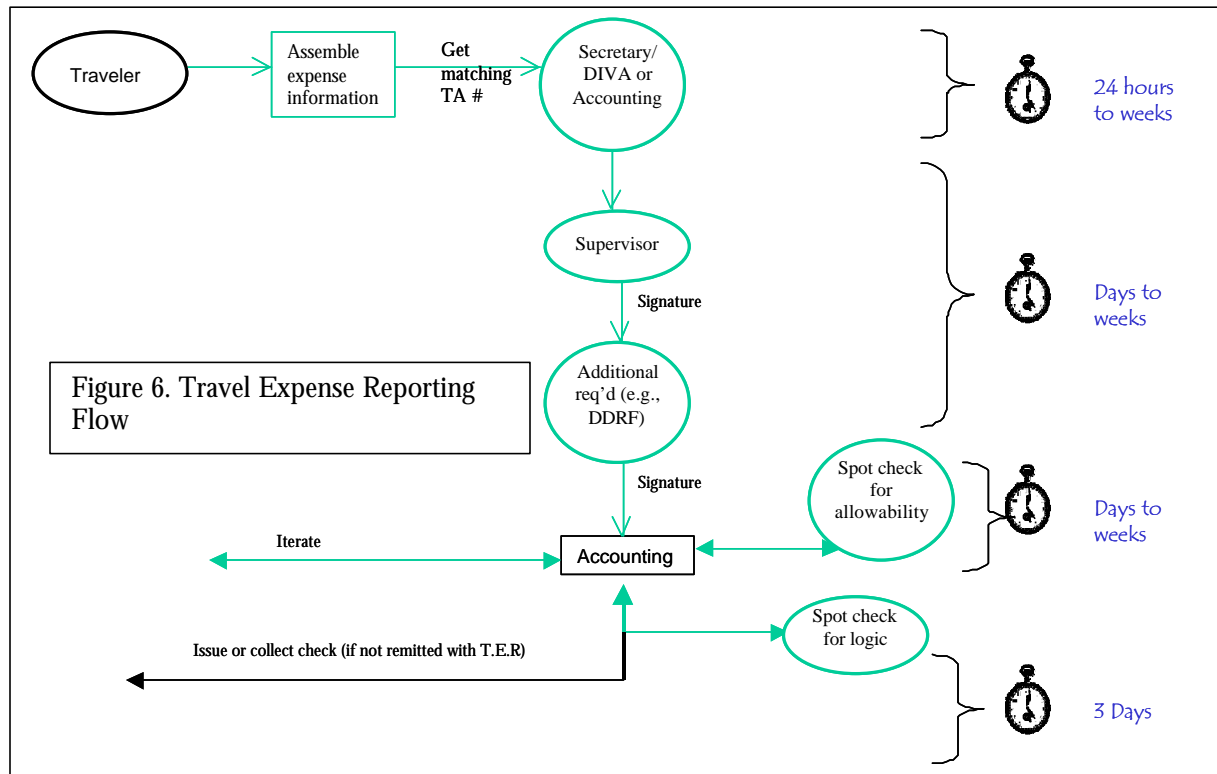
Figure 5 illustrates all the procedures followed with the Administration Division, spawned by Travel Office activity. The figure also calls out the products and services valued by travelers. Some of the services such as obtaining a required visa and facilitating GSFC approval for certain trips are very convenient. The travel advance service is convenient for travelers who wish to avoid carrying forward trip expenses on their own accounts.



The iterative process with the Travel Office allows flexibility and empowerment, but these values could be met equally by user-friendly on-line services that allow immediate bookings by travelers, secretaries or other traveler designates.

Travel Expense Reporting

Not surprisingly, the exercise of reporting expenses is time consuming and motivated by a traveler's desire for reimbursement. Travelers value that STScI issues reimbursement in a timely fashion (several days) and delivers checks to the workplace. Many travelers would prefer to have direct deposit of checks, even if the reimbursement took place less frequently than paper checks are cut. Figure 6 illustrates the Travel Expense reporting process that is not linked in any automated fashion to the TA, to the charge codes, to supervisors or authorizers or to budget managers.



Ancillary Processes

Travel expense forms are checked for logic (correct mathematics, correct allocation of payments between STScI and traveler, correspondence with receipts, number of days on official business, etc.) and for allowability (specific costs, meal allowance, etc.). 19% of the expense forms in FY00 need alteration with a total savings of \$1K. This number has been improved over several years after use of the spreadsheet version of the travel expense form became widespread.

Other Costs

Iterations and changes take considerable interrupt driven effort as discussed above

Some travel arrangements result in higher cost due to personal preferences of travelers. However supporting such arrangements usually results in personnel working more effectively, being available for functional work or research and other ancillary benefits such as better morale.

Some costs are incurred because the lower fares identified by travelers but lost due to significant time lag in the TA process. These additional costs are not tracked at this time, but are reported verbally by a significant number of travelers, amounts are often hundreds of dollars.

Motivation – travelers in control and accountable for their own budgets tend to be more frugal.

Other Budget Details

REQUIREMENTS

Data

1. Auditors
 - Do not need to see expenditures in travel at great levels of WBS detail
 - Need to see some control and approval system – signature on expense form will suffice
2. Project (GSFC)
 - Needs to see budget expenditures match budget plan
3. Division Heads
 - Appear to want high level of detail in WBS, however data not being used actively
 - Different divisions handle the travel budget differently and handle travel requests differently
 - ○ Number of WBS being used for Travel is too large. Some categories have miniscule expenditures and are rarely used for cost accounting and budget tracking.
4. Relation to Costpoint – a new costpoint structure is being constructed. Can the number of WBS be restricted for travel usage?

Conclusions

We adopted *Lean Thinking* to examine the STScI Travel Process. We successfully identified barriers, waste and unnecessary constraints in the existing flow. We documented user values, and in the process, discovered interesting facets of traveler behavior and work. We identified solutions that would enhance the process and contribute to improved productivity in the Travel Office and presumably for travelers as well.

Successes

We believe we successfully discovered ways to eliminate waste and create a process that would deliver key values to the user (traveler). We were pleased that our optimistic schedule for identifying a solution was fulfilled. We are confident that the solutions we discovered would improve the travel process for all concerned.

We were pleased that the presentation of our solutions to frequent travelers (mostly scientists and higher level engineers) was met with enthusiasm. The Scientific Staff endorsed our approach, and as a consequence we returned to the drawing board to craft the details of a feasible implementation.

Further, we believe the investment in using an innovative approach is worthwhile, research has demonstrated that once such approaches start, they can cluster and move an organization or unit forward (Wilson [2]). Also, this project helped Administration division redefine its work in terms of how it contributes to the larger flow of service to users (e.g., the travel contribution to technical and scientific discourse through conferences), a key goal of LT (Womak [1]).

Hard Lessons

We found that the implementation phase of our solution was fraught with frustration and setbacks. We were disappointed that there was significant management resistance to our proposed solutions. As could be anticipated from literature on innovation (c.f., Wilson [2] and numerous articles in Harvard Business Management, *The New York Times* and other periodicals), change solutions that require full consensus are difficult if not impossible to adopt. Wilson's theory is that adopting innovations is a political one characterized by bargaining. He further predicts that significant fortitude at the highest level of management is required in order to affect an innovative solution, but that "the executive seeks to reconcile the competing claims by mediation, by slowing the pace of events to insure that all affected parties are heard from, etc."

We were surprised that there was resistance to the concept of using user values as *the* principal data and metrics to evaluate the travel process. We regard STSci as an institution that is dependent upon delivering products and services to the scientific, technical and public audiences, so the skeptical attitude toward user values was startling. As Christensen [2] points out, industry [or organization] remains competitive in so far as as it identifies its customers needs and responds to them.

We were disheartened that there appeared to be a significant internal emphasis on *control* of travel. We sensed a general mis-trust of staff in this regard. Paradoxically we found that the desire to control the travel process was coupled with a desire to have Administration Division gate keep processes and budgets rather than provide user services. Surprisingly control within a functional unit was not always coupled with management processes such as invoking responsible budget planning and tracking, open communications with employees etc.

Lastly, we believe that the commercially available product may not deliver all the user values we required. It does appear to be a good solution for some of the process barriers encountered in the Travel Office. However, to create our own solution would be costly and delay implementation further.

Options

The options for the travel process are:

1. Make no changes – use the current system

This solution would not achieve any of the goals we identified, and would continue to cultivate frustration and inefficiency. This solution does not satisfy the requirement that Administration Division continue migration to a user-focussed service organization, shedding gatekeeping activities.

2. Create our own systems to handle requests and bookings

This solution is the most costly. It also would delay implementation significantly. Users would not realize a benefit for over a year.

3. No travel support at Institute

This solution is the most radical and is our backup solution. It relieves Administration from all burden for travel services. It maximally empowers travelers. It does require good travel budget planning, tracking and

management on the part of functional units. It requires excellent communication within divisions and within matrix agreements.

4 Implement ResAssist ☞ Recommended

The last solution meets a significant number of our goals, but not all. This implementation is described in the remainder of this document.

Implementation

1. Three methods of making travel arrangements will be offered:
 - a. We will implement ResAssist without mandatory authorization
 - b. We will implement Res Assist with mandatory authorization
 - c. We will preserve the paper process for divisions or personnel that require authorizations prior to making travel reservations
2. We will describe the implementation of the ancillary processes that need to occur to address other user values and other constraints

IMPLEMENT RESASSIST SOFTWARE

- a. ResAssist will be offered with mandatory authorization before ticketing for certain individuals
 - i. This option replaces the paper process with an online process
 - ii. This option has some similar pitfalls in that tickets cannot be booked unless the budget manager, supervisor or other authorizer completes the authorization. If that individual is on travel, the process cannot proceed.
 - iii. For each traveler, an individual can be automatically notified regarding the intended trip, but this notification is not a barrier to ticketing.

ResAssist software will be implemented in the following ways:

A) ResAssist with notification to third parties, but *without prior authorization*.

1. This implementation accommodates divisions, groups and teams that plan travel in advance. The implementation is based on the assumption that participating divisions, departments and teams create a travel plan at the beginning of each fiscal year, as a normal procedure in budgetary planning. For such groups, travel is essentially “pre-planned” and “pre-approved” by management.
2. This option accommodates units that have created organized, managed methods for conducting and tracking travel internal to the functional unit. These groups currently use verbal or email communication between supervisors, budget managers and travelers very effectively.
3. Travelers should be cognizant of their group/department/team travel plans, communicate regularly with supervisors and retain necessary documentation regarding trip details.
4. This implementation also accommodates travelers who wish to be in control of their travel arrangements.
5. A signature of authorization required on the travel expense form.

B) ResAssist *with prior authorization required* before tickets are purchased for certain individuals.

1. This implementation replaces the paper process for divisions, groups, teams or individuals that mandate prior authorization be obtained before ticketing occurs.
2. This option replaces the paper process with an online process
3. This option has some similar pitfalls for the traveler and has budget impact in that tickets cannot be booked unless the budget manager, supervisor or other authorizer completes the authorization. If that individual is on travel, the process cannot proceed. Higher fares may result.
4. For each traveler, an individual can be automatically notified regarding the intended trip, but this notification is not a barrier to ticketing.

C) We will adopt ResAssist under the conditions World Travel has proposed. The Implementation Fee is \$5000 (see details from World Travel). Additional costs are levied if less than 10% of the bookings are made with ResAssist.

- b. Travelers will have individual profiles and logins
- c. The Travel Office and/or designee's may have access to the traveler's login and/or allow others to arrange their travel (but see Profile Synch notes below).
- d. Travelers can change preferences for an individual trip
- e. A ResAssist manager must be designated and trained.

RETAIN PAPER PROCESS

For an unspecified period, the current paper process will be retained. The paper process is to only be used for organizational units or individuals who require written, hardcopy authorization prior to ticketing. Unsigned paper travel authorizations will not be accepted by the travel office.

Implementation Details

1. Traveler usage of ResAssist	
a. Determine the difference between the action that takes place with authorization and without. -What action takes place at reservation time? -What action occurs at purchase time?	<i>Notification is conducted by email. We do not yet know the nature of this feature. No relevant action takes place at "reserve time" Email is sent at purchase time.</i>
b. What does the request for authorization message look like?	<i>An email with a link Can we get the ascii text in a message?</i>
c. What does the notification message look like if authorization is not required?	
d. How does a user set up the individuals who get notification or authorization?	
e. How does a traveler get information about changes made to travel plans?	
f. Can traveler make changes?	<i>Not through ResAssist, after purchase Traveler can call airline, hotel, etc.</i>
How is international justification recorded? How are the notes used?	
How does one get a travel advance (through special handling notes)? Can we have a special button?	
Can a user stop anywhere in the process?	<i>No, user can pause at "Reserve" and at "Buy it"</i>
Platform compatibility:	
ResAssist does work on what platforms? It (does/doesnot) work on a MAC	<i>PC and UNIX ?</i>
2. Modifications to be made to ResAssist	
a. Input STScI charge codes ("cost centers")	
b. Request for travel advance	<i>Custom Button/box</i>
c. Handle international travel information requests and visa requirements.	<i>"Special Handling Box"?</i>
d. Drop down menu or fill in box for "Purpose of Travel"	
e. Add a facility for adding commentary such as contents of an email to the travel record.	
f. Handle GSFC approval requirements	

3 Profile Synch from World Travel:	
a. Capabilities	The software regularly synchronizes traveler profiles entered in ResAssist with the Sabre database used by travel agents, including the travel office
b. Implications:	Cost in addition to basic ResAssist cost
Profile access	Travelers <i>or their designees</i> keep traveler profiles current. For designees who are not travelers, this may mean travelers must entrust their username/password to the designee since
Profile costs	ProfileSynch is costed by the number of profiles used. In other words, it is an additional expense to have a designee allocated a username and password for the purpose of updating other traveler profiles. Alternatively if a designee has many travelers to handle, an individual username/password may be worth the cost.
c. Is the traveler the only person who can modify a profile?	<i>Yes, unless 3^d parties have a traveler's username and password information (not recommended). However profiles do not change very often.</i>
d. Can profiles be changed for an individual trip?	<i>Yes</i>
e. Can the travel office modify user profiles?	<i>Not through Sabre, only through ResAssist</i>
f. Can a designee make reservations?	<i>Yes for anyone they are authorized for - from their own account</i>
4 A ResAssist Administrator needs to be identified	That individual's responsibilities and requisite background will be determined by World Travel and STScI Administration
5. May travelers charge travel to their own credit card should they chose to?	This feature might be used varied travel purposes, for example, travel under the auspices of an outside organization.
6. How does the traveler see changes to the trip as it progresses? Suppose the travel office or designee makes changes?	
7. Can the traveler retrieve the trip information mere moments before departing for travel to check for latest arrangements?	

OTHER

- At STScI, the number of charge numbers for travel budgets should be simplified and limited since they are not being actively used. Is this a feature of the new WBS system?
- Budget managers should be identified for each individual charge number and get notified when that charge number is being used for a planned trip A budget manager is not associated with an *individual*, but rather, with a charge code.

Scenarios

SCENARIO 1 – RESASSIST: NO PRE-AUTHORIZATION REQUIRED

Scenario 1a

In this scenario, it is assumed that the traveler is part of a functional unit that constructs and maintains a travel plan for each fiscal year. A sample travel plan includes a spreadsheet of specific trips (e.g., ADASS), locations, and estimated costs as well as “generic” place holder trips (“technical conference at TBD West Coast Location for \$1800) – see Table below. Travel plans submitted at the beginning of fiscal years, are akin to proposals – the plan, once accepted is considered “approved” and can be modified or adjusted as needed through simple documentation.

Example TRAVEL PLAN for an STSci Functional Unit

Trip	Location	Estimated Cost	Actual Cost
1. ADASS	Hawaii		
1.1 TBD SW developer		\$1800	
1.2 TBD Scientist		\$1800	
Total		\$3600	
2 Technical Conference	TBD Europe		
2.1 J. Engineer		\$2500	

The traveler initiates a trip idea to a Technical Conference. It is assumed that this traveler has already discussed or communicated this idea with a supervisor (if necessary) and other affected individuals. The traveler communicates information to others through normal status meetings, email or reports. Any restrictions on the trip should be noted in the travel plan and be emphasized in normal communications with the budget manager. The traveler knows the trip is in the travel plan. The traveler, in fact, may be the budget manager or the lead responsible for the budget.

Since travel plans are revisited quarterly to comply with normal STSci Program Management reporting to the project and to compare with budget reports, newly anticipated trips are easily accommodated and trips not taken can be re-assigned.

Book the Trip: Using ResAssist, the traveler finds flight schedules that conform to his/her needs and reserves the trip. The traveler can immediately select the “buy it” option or can defer to later, when information about the technical conference is finalized.

Note that, as for all online and human served systems, fares are not guaranteed if the “buy it” option is not executed promptly after reserving.

ResAssist information is distributed to individuals who need to be notified including the budget manager.

The Travel Office books the flights within 24 hours and secures hotel and car rental reservations according to those selected by the traveler, or those indicated in the traveler’s user preferences. A travel advance is issued if requested, and if GSFC approval is required, that process is initiated.

The traveler checks the itinerary on the web and conducts the trip, since all reservation information is electronic and has been downloaded to his/her PDA.

Scenario 1b

If the traveler is a grant holder, the trip proceeds in much the same way. The grant holder is responsible for the budget, or has made arrangements for budget monitoring with Admin.

Scenario 1c

If the traveler does not wish to use ResAssist, a designee (DivA, assistant, Travel Office) may perform all the same operations as in Scenario 1a, except the traveler is responsible for the normal communication with supervisors, peers and subordinates.

In all the above scenarios, the Travel Expense form is signed by both the Traveler and an appropriate supervisor to authorize the expenditure.

SCENARIO 2 –RESASSIST WITH PRE- AUTHORIZATION REQUIRED

In this scenario, a travel plan may or may not exist for a functional unit. It is still assumed that normal communications between travelers, supervisors, peers and subordinates occurs for functional planning purposes.

In this scenario, the traveler or designee can select the optimal trip for the traveler. Once the traveler has selected or agreed to the itinerary reserved, the “buy it” option is selected. This action then spawns an authorization notice to the designated authorizer for that individual traveler.

The fare is not purchased, and no Travel Office activity takes place until the authorizer responds. If the authorizer does not respond within the 24 hour period, fares may increase, or particular flights may not be available.

Once the fare is authorized, travel arrangements can proceed with traveler selected or Travel Office selected car rental, and hotels. A travel advance can be obtained. Other individuals who require notification regarding the traveler’s trip are notified.

Expense reports are handled as in scenario 1.

SCENARIO 3- PAPER PROCESS

Same procedure as today, however the Travel Office will not process unsigned TAs nor will service email requests without paper documentation.

References

- [1] Womak, J.P. and Jones, D.T. *Lean Thinking* (Simon & Schuster).
- [2] Wilson, J.Q. 1963 *Innovation in Organization: Notes Toward a Theory, Approaches to Organizational Design*. J.D. Thompson, *ed.*, (University of Pittsburg Press:Pittsburg)
- [3] Christensen, C.M. 1997 *The Innovator's Dilemma*, (Harvard Business School Press: Cambridge).
- [4] Utterback, J. *Mastering the Dynamics of Innovation*,