

# Without Software Tools, Resource Management is more Art, than Science.

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Resource Management Chapter



**Professional Services Automation**

Optimizing Project & Service Oriented Organizations

 upland **Tenrox**

# Without Software Tools, Resource Management is more Art, than Science.

Resource management enables improved tracking, deployment, matching and prioritizing of resources based on skills, interests, location, availability and business practices for a given service engagement. As a key component within a PSA solution, Resource Management enables improved resource utilization.



Complex projects require massive ongoing efforts to communicate objectives, plans, define milestones, schedule tasks and allocate resources. An organization that handles multiple complex projects in parallel has the added burden of making sure that resources are optimally utilized. For Professional Services Organizations (PSORGs), it is very costly to have high skilled resources on standby due to scheduling issues or poor planning. This can sometimes result in a significant loss of profitability for the team and the enterprise.

Resource Planning (RP) software can efficiently manage and allocate resources across all engagements. RP allows managers to track resource skills, interests and availability. Furthermore, RP enables managers to reserve and schedule resources based on availability, skill / interest matching, project priority, overloading and other factors.

Many organizations use spreadsheets (such as Microsoft Excel), a shared calendaring system, or even paper to reserve, track and manage resources and projects. Sometimes a project management tool, such as Microsoft Project, may be used for such purposes. The inherent costs associated with this highly manual, inaccurate and inefficient process goes unnoticed in the initial phases of a project, but is more visible as the project gets well underway. Without the right software tools, management lacks visibility, is unable to make decisions based on accurate data, and cannot establish the relationship between many business variables in order to detect developing trends early enough to be proactive.

**Instead they must react after the fact, and even then their information systems may be so poor, that they may still not be able to make the required changes.**

# What is Resource Planning?

Resource Planning involves the selection of required resources based on their type, skills, interests, proficiencies and availability in order to carry out a project. A resource can be an employee, a consultant, software, equipment or anything else required to complete a project.

Resource Planning software includes modules to manage resource calendars (availability) and skill sets, details on project engagements including required skills per task, task dependencies, task start and end dates and proficiencies. RP software also have the ability to run RP queries using user created scenarios based on parameters such as project priority, start/end date, importance of skill matching/availability, interest, location, and the ability to overload resources.

## Forecasting staffing needs & requires one to determine the following:

- Estimate demand for resources by engagement (contract), project or activity.
- Find qualified resources based on skills, interests, and proficiencies.
- Compare the availability of required skills to the schedules and deadlines.
- Search for qualified resources by skills, interests, and availability when assigning work.
- Engage new resources from an external source (as a last resort).

## Standardizing and benchmarking these steps allows management to:

- Have a central directory of resource skills, proficiencies and profiles
- Track and report on resource utilization
- Report on resource skills, interests, calendars, project milestones, requirements and critical paths
- Plan in terms of capability and availability to meet future needs
- Optimize utilization and hiring of resources

Generate a comprehensive resource plan that highlights resource gaps (known as Gap Analysis: when a resource is idle). Gaps can be used to take on additional engagements or used for training purposes

**Maximizing the use of limited and precious resources will ultimately result in substantial efficiencies, higher profit margins, faster response times, customer satisfaction and improved employee retention and morale.**

# In an organization without a formal RP process, project managers are engaged in an art rather than a science.

In an organization without a formal RP process, project managers are engaged in an art rather than a science: to make decisions based on intuition, what they may have knowledge of, one-on-one communication, hearsay, meetings and informal analysis. Managers use these inefficient and flawed techniques to determine what resources are allocated to which projects and engagements. This informal and unmanaged process can lead to resources being overloaded, as well as cause resource gaps, unforeseen resource shortages, and other scheduling/reservation problems that can significantly impact the outcome and delivery dates of any project.

## Here is a list of the issues that arise without proper Resource Planning:

- X** Inaccurate method of determining resource gap and inability to adjust accordingly
  - Difficult to ensure that the appropriate resources are engaged on a project in a timely manner
- X** Cannot effectively determine optimal resources and workloads which can jeopardize project completion date
- X** Unable to easily assign and track work
- X** Inability to determine resources that need to be hired, and at what point in time should they be hired
- X** Difficulty in the selection process of resources or determining which candidates are most qualified, given skill set, availability and priorities
- X** Difficulty in performance assessment
- X** Inability to avoid congestion and conflicting priorities during peak demand
- X** Poor skill and interest matching
- X** Difficulty in specific talent search and scheduling
- X** Inability to forecast accurately future resource needs and requirements

## The benefits of implementing Resource Planning can be summarized as follows:

- ✓** Improves scheduling capability.
- ✓** Powerful and user friendly system that allow managers to perform matching resources to projects based on expertise, interest and availability.
- ✓** Ability to streamline and automate resource planning process, thus avoiding gaps.
- ✓** Enhance resource and/or employee productivity by minimizing uncertainty and waste.
- ✓** Can quickly take action to pursue profitable engagements.
- ✓** Avoid or minimize overloading, overbooking, and underutilization.

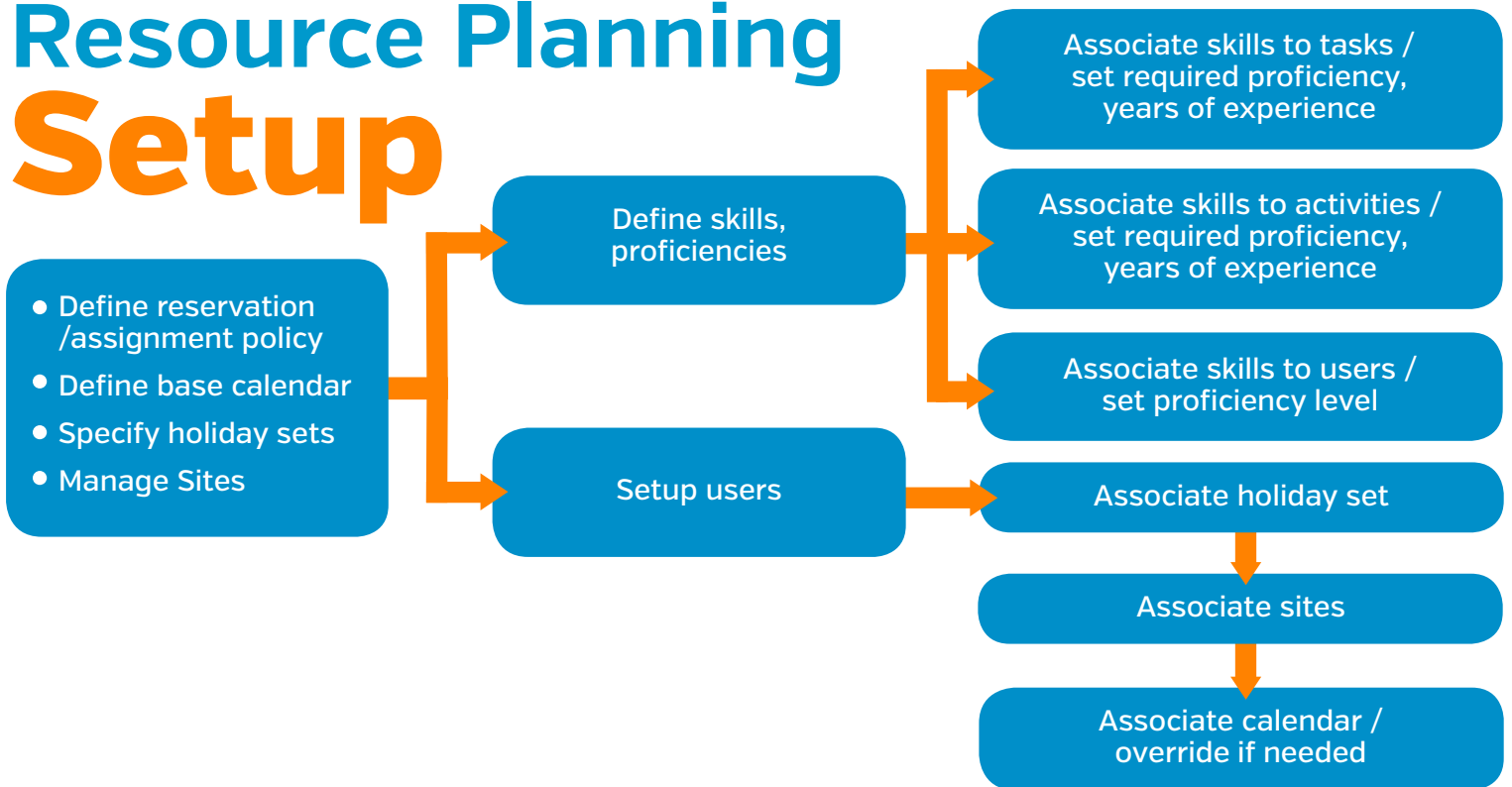
# Due to the casual use of various terms and concepts, Resource Planning is a complex topic that is often poorly understood

TERM/CONCEPT	DESCRIPTION
<b>Activity</b>	An activity is a Project specific task, which has a start and end date
<b>Assignment</b>	A specific resource assigned to a particular activity
<b>Assignment policy</b>	Specify to reserve resource if the activity is assigned and the reservation hours per day
<b>Availability</b>	The indication of when and how much of a resource's time can be scheduled for assigned work
<b>Availability score</b>	The level at which the resource is available for work (measured in units), for example, at 50%, 90%, or 100% of full-time
<b>Calendar</b>	A template calendar that specifies reserved, available and unavailable time
<b>Engagement</b>	A contract; an agreement between two or more parties for a set of specified deliverables usually with predefined milestones
<b>Group</b>	A set of resources
<b>Proficiency</b>	The degree of excellence, or the desired standards, in a project
<b>Project</b>	A project is a plan with a set of tasks and resources that need to be scheduled, assigned and tracked
<b>Reservation</b>	Book a resource
<b>Reservation policy</b>	Specify whether to auto assign work if resource reserved and the default number of hours reserved per day
<b>Resource</b>	The people, used to complete tasks in a project
<b>Resource Calendar</b>	A calendar that specifies working and nonworking time for an individual resource. Resource calendars are used to specify holidays, vacations, working days, shifts and to track reservations

# Key terms and concepts continued...

TERM/CONCEPT	DESCRIPTION
<b>Resource Breakdown Structure (RBS)</b>	Hierarchical organization of resources that facilitates both roll-up reporting and summary resource scheduling by enabling one to schedule at the detailed requirement level, and roll up both requirements and availabilities to a higher level
<b>Resource Gap Analysis</b>	Perform assignment and reservation of available resources or Plan on hiring required Resources
<b>Resource Leveling</b>	The process of rescheduling activities such that the requirement for resources on the project does not exceed resource limits. The project completion date may be delayed in the process
<b>Resource Planning</b>	The indication of when and how much of a resource's time can be scheduled for assigned work
<b>Resource Planning Queries</b>	Queries can be named and saved for future reference
<b>Resource Smoothing</b>	The process of rescheduling activities such that requirements for resources on the project do not exceed resource limits. In smoothing, as opposed to resource leveling, the project completion date may not be delayed. Activities may only be delayed within their float
<b>Resource Utilization</b>	The ability to predict the performance of a resource during actual deployment
<b>Scheduling</b>	The timing and sequence of tasks within a project
<b>Site</b>	Organization's location
<b>Skill</b>	Qualification
<b>Skill score</b>	This value is expressed as the percentage of resource proficiency and selected proficiency for specific skill.
<b>Soft Booking</b>	In short, "hard" can be considered a confirmed booking, "soft" a tentative one.
<b>Total score</b>	The average of Skill score and Availability score, taking into consideration the importance of the Skill and the Availability.

# Resource Planning Setup



## Resource Planning Setup:

- **Define reservation/assignment policy:** For some organizations, assignment of an activity to a resource (to do actual work) may be not be the same as reserving a resource; While for another organization reservation may automatically imply work assignment. The reservation/assignment policy defines this relationship and also lets the administrator specify the default number of hours for reservation
- **Define base calendars:** Administrators should be able to define based calendars; the base calendars can be associated to sites and groups. Users created within a specific group automatically default their user calendar to their group calendar. The user calendar can then be initialized to the user specific availability and agenda
- **Define regional holiday sets:** Larger, geographically or structurally dispersed organizations have multiple physical and virtual sites. The employees of such an organization may have various holiday calendars. The RP system, must take this regional availability into account when booking resources
- **Manage sites:** Define and configure the physical or virtual sites that represent how the organization is structured
- **Define Skills, Proficiencies**
- **Associate Skills to Tasks, Activities**
- **Associate Skills to Users, specify interest level**
- **Setup Users**
  - ➔ **Associate Holiday Set:** specify user's holiday set; user's calendar should automatically be updated with the holidays defined within the set
  - ➔ **Associate Sites:** set user's master (the user's home office) and active site (where the user currently works)
  - ➔ **Set User Calendar:** select an alternate base calendar if the Group base calendar does not apply to this user. Also, set availability of the user for various date intervals

# Scheduling Techniques

RP systems also have the option to automatically schedule a project based on the information provided. Various techniques exist for generating a project schedule. This section describes the most widely used techniques.

## **Critical Path Method (CPM)**

CPM is a Project Management technique that is used to schedule project tasks so that the project is completed as fast as possible. CPM relies on accurate task estimates, earliest start date and latest finish date per task, and task sequence [task dependencies]. CPM does not take into account resource availability. The techniques that follow improve on CPM by considering availability.

## **Resource Leveling**

Tasks are moved within their minimum and maximum start/finish dates in order to maximize resource utilization; as a result, project completion date may be delayed.

## **Resource Smoothing**

Resource Smoothing is also known as Time-Limited Resource Scheduling. Tasks are moved within their minimum and maximum start/finish dates in order to maximize resource utilization; with this technique, unlike Resource Leveling, the project completion date cannot be delayed.

## **Resource-Limited Resource Scheduling**

Project start and finish dates reflect expected resource availability. The final project schedule is always limited by the availability of resources.

## **Program Evaluation and Review Technique (PERT)**

PERT is a project management technique that uses probabilities to schedule a project. Each activity is assigned a best, worst, and most probable completion time estimate. These estimates are used to determine the average completion time. The average times are used to compute the critical path and the standard deviation of completion times for the entire project.

### **Using an RP Query, one can:**

- Search for qualified, available or qualified and available resources
- Search for available skills
- Filter by Site[s] or Group[s]
- Select projects or activities to use for skill matching
- Define minimum Skill, Availability and Total scores (to prevent overloading or overworking)
- Specify importance of Skill and Availability

## **Search for Qualified Resources**

Perform skill matching by specifying Skills, keywords or aliases; without considering availability. Additional configurable parameters should include:

- Select proficiencies that are equal, higher or lower than a certain specific level
- Select years of work experience
- Search for a specific set of Skills and Proficiencies
- Specify interest level (ex: very interested or career goal)

## ***Search for Available Resources***

Search for availability; without considering qualifications. Additional configurable parameters should include:

- Ignore availability based on Project/Activity state and priority
- Ignore interests
- Allow overload based on Project/Activity state and priority
- Reassign work to match resource availability based on Project/Activity state and priority
- Look for resources that are willing to travel and/or relocate

## ***Search for Available Skills***

This query is an accurate method of determining resource gap and the ability to take action accordingly. For example, an engagement is known to require 200 hours of marketing, 100 hours of PR work and 300 hours of call center management. A search for available skills results in resource shortages as follows: 50 hours of PR, 250 hours of call center management. The system should allow the manager to setup the necessary notifications and reminders so that the resources are made available when required through reassignment from other sites or by hiring additional resources. Optionally, the RP system can be integrated with the HR system to automatically initiate requests for additional staff



# Notifications

Notifications are a **key component of any RP system.**

*The following is a list of key notifications that should be provided:*

- Display warning (or send email) if no resources have been allocated (assigned) to an engagement; the notification can be set to be automatically triggered a certain number of days before the engagement starts.
- Send email to a project manager to inform that resource R1, R2, ... Rn have been reserved for a project but they have not been assigned to work on the project.
- Send email to engagement manager if previous queries failed to find sufficient resources to work on the engagement. In this case engagement manager would have to follow up with HR to ensure resource are hired
- Setup notifications that warn when critical resources are overbooked or are under utilized for extended periods of time

## Return on Investment (ROI)

The ROI calculations shown below demonstrate the cost savings that can result by increasing resource utilization in project and service oriented organizations.

These figures do not include the benefits associated with workforce optimization, project reporting, resource planning, budgeting, forecasting, automating administrative and other manual

Total Number Resources	20	50	100	200	1,000
Total Number of Billable Resources	6	15	30	60	300
Total Number of Non-Billable Resources	12	35	70	120	700
Additional Revenue Gained With Increased Utilization	\$12,480	\$31,200	\$62,400	\$124,800	\$624,000
Yearly Savings in Non Billable Resources	\$3,600	\$10,500	\$21,000	\$42,000	\$210,000
Estimated Annual Billing	\$418,080	\$1,045,200	\$2,090,400	\$4,180,800	\$20,904,000
Savings in Cost of Capital	\$458	\$1,145	\$2,291	\$4,582	\$22,908
Total Annual Return	\$12,404	\$32,134	\$64,268	\$128,537	\$642,681

## Sample ROI calculation:

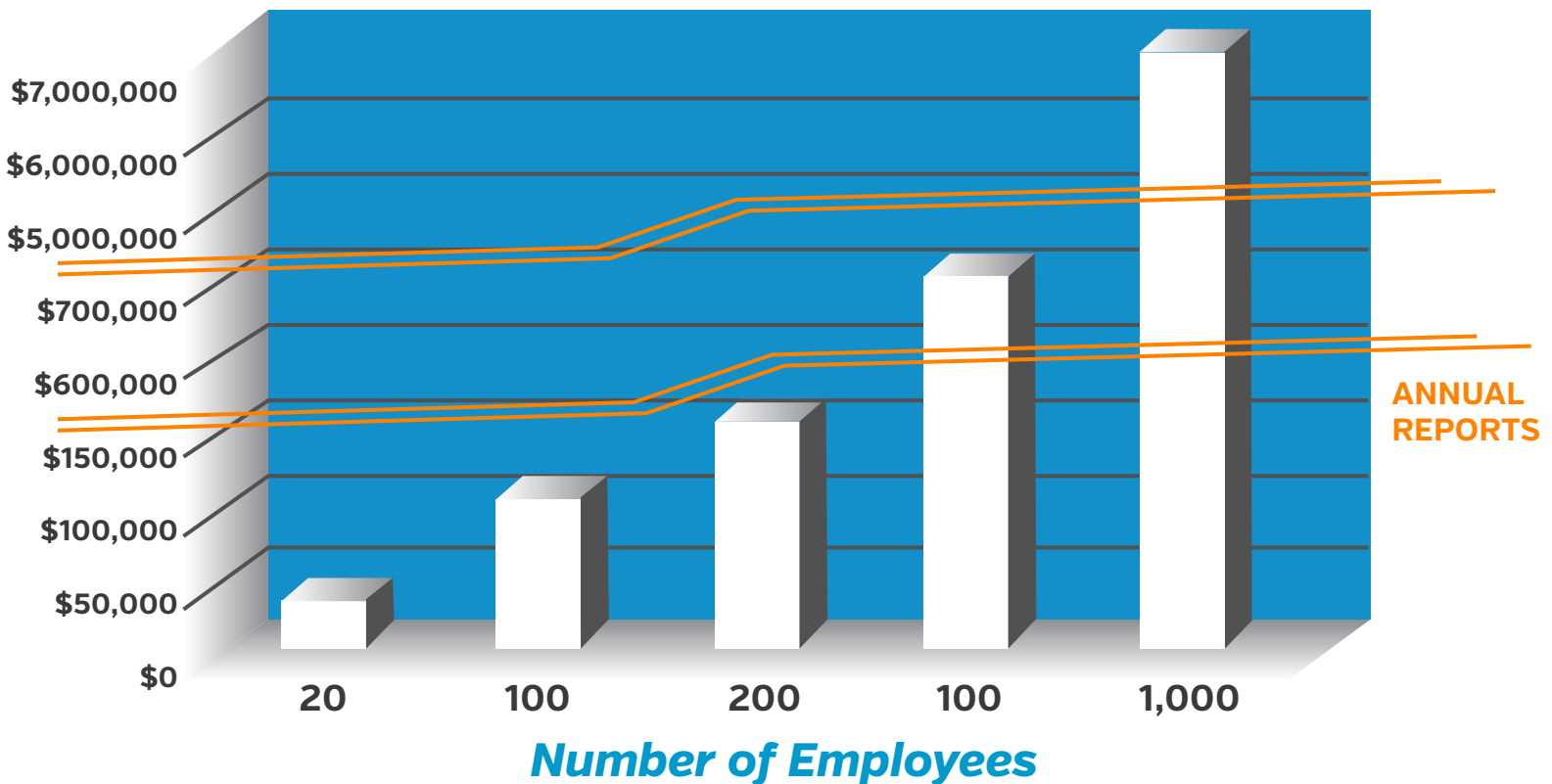
The average billing rate per hour is \$50/hour and the average non-billable resources salary is \$30,000 respectively.

Weighted Average Cost of Capital [WACC] defined as the average rate for the company to raise or borrow additional funds and set at 10%. The WACC can vary for companies depending on their ability to raise capital through debt or equity.

Productivity Improvement in Days for Invoicing and Payment Cycle is calculated to be 4 days based on the non-billable resources productivity being improved by 1%.

Total Annual Return is calculated at 75% for first year as 3 months is allotted for site planning, implementation and roll out.

## Sample ROI calculation:



## Conclusion

Resource Planning is a key PSA component that is of special interest to consulting organizations or any organization that has precious and limited resources that are assigned to various engagements.

Until a few years ago, Resource Planning has been a complex technology that was available to the privileged few. Significant global competitive pressures, advent of the Web and many other technological factors have contributed to making this and other enterprise technologies available, affordable and intuitive to use.

# Recent Resources on Resource Management



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**Watch Now!**

Time Tracking for the Globally Dispersed Workforce

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