

## Southern Lights And Shadows

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26

2018. We offer high quality tools, made in the U.S.A. We offer a full line of AREMA track tools manufactured to current specifications We have a knowledgeable staff and a person on the other end of the phone when calling during our convenient hours of 7 am -5 pm EST Monday through Friday If we don't [...]

### fisch-tools — ultimate drilling solutions

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### railroad tools and solutions | railroad products and supplies

- power tools & accessories
  - spike pullers
  - e clip tools
  - impact wrenches
  - power luber
  - power tool lubricant
  - railpaste
  - rail rider
  - rail sweepers
  - gauging arm
  - spike drivers
  - tool holders & carbide inserts
  - abrasives
  - broach cutters & drill bits
  - tie tampers
  - rail saws
  - impact drills
  - in-line oilers
  - grinders
  - broom elements
  - hoses
  - tie drills
  - flangeway cleaners
  - power units
  - rail drills
  - sockets & accessories
- gauges
  - rulers & tape measures
  - structure clearance
  - robel
  - dial tire pressure gauge
  - car & loco gauges
  - monitor 4 pocket geiger counter
  - measuring wheels
  - rail profile templates & depth gauge
  - rail grading
  - steinmeyer
  - plumb bob
  - railroad inspector kit
  - laser offset
  - spring frog inspection kit
  - switch and crossing
  - frog flangeway gauge
  - radius
  - thermite welding gauge
  - frog point conformal gauge
  - frog straight edge and ruler
  - track gauges
  - brakeman's test gauge
  - rail grinding
  - portable track loading fixture
  - taper
  - rail joint misalignment
  - measuring pole
  - railwear gauges
  - speed measurement device
  - abtus
  - inspection mirror
  - stringliner
  - platform
  - 3rd rail
  - calipers
  - switch obstruction
  - void meter
  - dynamic analyzer
  - track tool wear
- track accessories
  - switch point locks
  - quick crossing flangeway
  - absorbant matting
  - geotextile materials
  - shim packs
  - switch points
  - rail clips
  - switch stands & components
  - track fasteners
  - gauge rods
  - car stops
  - bumping posts
  - blocks
  - wheel chocks & rail skates
  - rerailers
  - rail signs
  - sign stands
  - flags & staffs
  - derails
- track tools
  - wrenches
  - the ultimate clamp
  - rail rollers
  - track jacks
  - drift pin striking pad
  - toe jacks
  - tie plug drivers
  - tow bars
  - tie lifters
  - lizard skin
  - carts, dollies & push cars
  - rail alignment tools
  - spike & sledge handle remover
  - rail puller coupler
  - pocket bucket
  - plate & spike hooks
  - railroad car mover
  - track liner
  - rail heater
  - hand tools
  - tie plate tools
  - all purpose propane torches
  - air wand
  - fuel cans
  - rail pullers
  - pickup magnets
  - track layer's square
  - mounted coupler/movers
  - rail skidding shoe
  - concrete tie lifting
  - thermometers
  - re-threading hex dies
  - rail threaders & rollers
  - torquing
  - rail handler

- sling polyester
- tough sprayer
- tie counters
- railroad cribbing bucket
- hammers
- head protector
- shrink tube
- jack & stabilization pads
- tie marking
- rail grabber
- multi-use tripod
- come-along chain hoist
- fastener tools
- tongs & clamps
- spike setters
- mechanical expander/puller
- forged track tools
- mattocks
- adzes
- picks
- mauls
- punches
- tongs
- bars
- drift pins
- wrenches
- spike pullers
- spike lifters
- rail forks
- sledges
- shovels
- switch brooms
- arema spiking tools
- spades
- nipping tools
- chisels
- dead head drivers
- ballast forks
- kits
- track inspectors kit
- industrial non-sparking tool kit
- bnsf flagging kit
- mow socket kit
- basic flag kit
- ultimate flagging kit
- welding
- hot debris box
- welding seat
- mini infrared thermometer
- smoke cannon
- thermite tool kit
- protective gear
- journeyman welding kit
- portable welding screen
- refractory paste
- rail grinding fixture
- carbide flat file
- cwr tread and gauge alignment tool
- wedges
- magnetic work holding tool
- welding blanket
- heavy duty ground clamp
- alignment plates
- soap stone marking
- temperature indicators
- hand brushes
- side cut pliers
- welders chipping hammer
- welding gauges
- welding rods
- hydraulic rail puller
- welder/signal cross cut chisel
- weld shear
- railhead backup jig
- 36" straight edge
- welding wire
- copper frog repair jig
- rail laying and thermite welding tags
- plugging & grout
- tie plugs
- iso-flex rail grout
- tie plugging cartridges
- tie plugging powder
- safety lighting
- blue
- batteries
- head lanterns
- alarm arm
- remote area flashlights
- eot
- shove
- vehicle approach warning light
- safety & first aid
- flags & staff
- backpack sprayer
- hot stick
- lockout & accessories
- whistle
- barricade tape
- ppe
- fall protection products
- flares
- hitch shin protector
- traffic control
- fouling point marker
- 3m reflect tape
- spill containment
- hazmat absorbant booms
- third rail alarm
- protective hand cream
- insect tags
- sqwincher
- first aid kits & cabinets
- kneeling pad
- boom dog
- brake sticks
- big stik ® brake stick
- accessories
- ibc tool
- brake stick lubrication
- brake stick repair center
- car & loco
- hopper car wall scraping tool
- roller bearing straps
- uncoupling lever retention strap
- brake shoe prybar
- friction block retaining pin
- knuckles & couplers
- f-pin fixture
- cotter pins
- openers
- lever style hand brake
- vent protector socket
- platform
- railcar cushioning device lifter
- railcar education pipe puller
- jack & stabilization pads
- elcon national empty load valve test handles
- repair
- railcar vibrators
- hand brake
- brake rod support fixture
- 60 ton side sill stand
- gauges
- transport dollies
- jacks
- single car test cart
- loco chock
- side bearing
- lift table cart
- loco decals
- hopper gate installation fixture
- railcar wheel set chain sling
- locomotive seat low back
- bolster lifting sling
- lube
- ibc
- carman's assist handle
- center pin removal tool
- side frame lifting fixture
- slide sledge
- brake beam
- loco signs & flags
- emd piston snap ring remover
- cut-out valve handle
- propane tank carrier
- railcar wedge kit
- loco draw bar straps
- side access
- friction shoe press
- adjustable bolster safety support tool
- manway
- traction sand
- draft gear
- vertical pin retainer cap removal tool
- plug door wrench
- straightening tools
- railcar vent

- protector plug tool
- undesired emergency detection system
- airbrake
- lockout
- rail puller coupler
- service carts
- wheel set rest blocks
- car openers and vibrators
- accessories
- manual openers
- railroad hopper car door openers powered

• c & s

- punch & chisel holders
- portable demagnetizer
- test shunt
- switch obstruction gauges
- red insulating enamel

- bonding drill bit
- e-post wrenches
- terminal wrenches
- no-ox electrical contact grease
- backout punch for signal bonds

- rubber insulated tie plates
- switch rod insulation kits
- switch wrenches
- signal punch

• lubricants

- super lube
- no-ox-id
- stainless steel hand sprayers
- ice free switch
- glidex
- absorbant track matting

- enviro-mlt
- tramlub
- switch plate lube
- lube discs
- aar lubricants
- spill containment

- accessories
- slip plate
- power tool lubricant
- heavy duty grease gun
- wayside lubrication

• job boxes

- jobsite chest
- jobsite box
- welders box

- 
- over 16,000 items in stock shop now
- 6,000 sq. ft. facility shop now
- due to current market conditions we apologize for any inconvenience this may cause. feel free to contact us directly with any questions. a note to our customers: we will notify you of any changes before your order ships. price, availability and shipping costs are subject to change without notice.
- yard sale shop the yard sale a selection of discontinued, scratch and dent or surplus items

your gauge headquarters a kit for every job featured

- rail quick lubeoptions available call for price call for pricequick view
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- best seller glidex mc track switch lubricantrrt-2093 mc 5 \$133.95 add to cartquick view
- tie plugging cartridges: 1 case 12 unitsrrt-5045 call for details 513-533-7070 call for pricequick view
- sure spike powered spike hole fillingrrt-550456p call for pricing 513-533-7070 call for pricequick view
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overview

xtools ultimate is a shareware software in the category business developed by vng, inc..

it was checked for updates 31 times by the users of our client application updatestar during the last month.

the latest version of xtools ultimate is currently unknown. it was initially added to our database on 10/26/2018.

xtools ultimate runs on the following operating systems: android/ios/windows/mac/linux.

xtools ultimate has not been rated by our users yet.

write a review for xtools ultimate!

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- miscellaneous

**the ultimate list of small business software & tools**

- grasshopper
- academy
- blog
- resources

insights for entrepreneurs

- browse
- search
- products
- subscribe

browse by skill level

- getting startedfor the beginner marketer
- off the groundfor the intermediate marketer
- on a rollfor the advanced marketer

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- miscellaneous

browse by topic

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- content marketing
- email marketing
- marketing campaigns & pr stunts
- metrics & roi

- ppc
- print marketing
- seo
- social media
- websites
- word of mouth

search for

browse products

- virtual phone systemmanage your business on the go
- 800 number for your business
- toll free numbers
- vanity numbers
- cloud phone system

get our content

the ultimate list of small business software & tools

when it comes to running a small business, having the right tool for the job can make a huge difference in both your workday and your business performance. that's why now is a great time to be an entrepreneur — you still need to wear a lot of hats, but there have never been more business tools available to help you fit into those hats a little better.

the key is finding the right tool, right when your small business needs it. that's why we created this giant list of software and other resources — from accounting software to small business marketing tools and everything in between. we've even included some of our picks for the best options within the category.

go ahead — jump to whichever section you need a solution for:

- accounting & bookkeeping
- website building
- marketing tools
- public relations

- customer service
- team communication
- project management
- productivity & focus

- recruiting & hr
- document management
- tax software
- entrepreneurial growth

what does a green star mean?

tools marked with a green star are ones that the grasshopper team uses ourselves.

looking for a solution that's not on the list?

send an email to [blog@grasshopper.com](mailto:blog@grasshopper.com), and we'll work to get some options added.

accounting & bookkeeping 1. wave apps

totally free solution that includes accounting, invoicing, payroll, and more.

2. quickbooks

all-inclusive accounting software with packages designed specifically for small businesses and contractors.

3. freshbooks

comprehensive accounting solution tailored to service-based small businesses.

4. xero

robust and complete software that's hosted in the cloud, so no downloads or installations.

compare these tools ? our pick: wave

price: free

wave is a great accounting software especially for small [businesses] or startups... the invoicing and billing systems are easy to use and even better should you have any accounting knowledge.

website building 5. squarespace

an all-in-one website building solution that make it super easy to create a stunning, professional-looking website for your business.

6. wordpress

choose from thousands of free and premium themes to get your small business' website or blog up and running in no time.

7. wix

drag-and-drop web building tool lets you choose from thousands of themes and customize individual pages.

compare these tools ? our pick: wordpress

price: free - \$25/month

i use it for all of my personal and client sites. it's easy to use and easy to set up. not to mention, the opportunities for customization are endless.

online payment tools 8. paypal

accept credit cards and paypal payments on your online store — paypal handles the processing, security, and mobile compatibility.

9. square

you can create an ecommerce store through square and accept online payments or use the square payments app with 3rd party web platforms.

10. stripe

add stripe checkout to your small business' website to utilize their pre-designed and customizable payment forms.

11. shopify

build your entire online store through shopify and they'll take care of everything from marketing to payments & shipping.

12. amazon payments

make checkout easier and faster for customers by integrating amazon accounts and checkout.

compare these tools ? marketing 13. hubspot

choose from crm, sales, or full-fledged marketing software to help you automate your marketing process.

14. marketo

end-to-end marketing automation covers everything from lead management and consumer marketing to email and customer base marketing.

15. hatchback

all-in-one small business marketing tool and crm solution helps you plan, automate and monitor marketing activities.

16. infusionsoft

inclusive sales and marketing automation software that handles lead capture and conversion and some crm tasks.

email marketing 17. mailchimp ?

fully customizable email campaigns and automation that integrate seamlessly with ecommerce solutions like shopify.

18. campaign monitor

simple drag-and-drop function allows you to design unique and engaging email marketing campaigns.

19. emma

create results-oriented email campaigns and leverage insightful reporting to meet your goals faster.

20. aweber

at the forefront of email automation, they offer powerful integrations with sites like paypal and wordpress and boast a+ customer support.

21. constant contact

customizable drag-and-drop templates, powerful automation, and real-time reporting make it easy to see success.

our pick: mailchimp

price: they offer a forever free plan and prices go up based on number of subscribers. for 10,000 subscribers, you'd pay \$75 a month.

rigorous list management, fantastic email templates, the best web interface out there, incredible analytics, a robust workflow process, powerful segmentation, and a free starting plan with reasonable rates as your list size increases.

social media marketing 22. buffer

create and schedule engaging social posts on all of the big social media sites — from twitter and linkedin to pinterest and instagram.

23. tweetdeck ?

keep track of everything that's happening on twitter by creating searches and hashtags, and get alerts when new content is posted.

24. hootsuite

the all-in-one social media scheduling, listening, and reporting tool helps you do more with your social presence.

compare these tools ? paid advertising 25. adwords ?

create text-based searches, set your budget, and choose keywords to bid on to decide where your ads show up in google searches.

26. bing ads

advertise your small business in bing search results, where you'll get more value for your marketing dollar.

27. outbrain

help you content reach more eyeballs by creating pay-per-click campaigns and advertising on huge sites like people and cnn.

our pick: adwords

price: pay per click (ppc)

you can see what keywords are converting. you can see which ads are effective in driving traffic to the site. adwords is an indispensable product for any commerce strategy.

content marketing & seo 28. contently

a platform for all your content marketing needs from topic generation to execution by a huge network of talented freelancers.

29. uberflip

tailor your content to your customer's journey and integrate your content platform with automation solutions like hubspot and marketo.

30. sumome

a web analytics tools to help you build email lists, optimize landing page conversion, and increase social shares.

31. moz ?

a tool for small business marketers to simplify the complicated worlds of search marketing and online paid advertising.

our pick: moz

price: \$84/year for moz local and \$50 and up per month for moz pro (depending on features)

## Access free Southern Lights And Shadows

we use moz a lot to research new keywords that may result in sem/seo opportunities for the organization. it has proven to be a very useful tool monitoring our competitors.

print marketing 32. moo

a tool for all paper collateral — especially adept at helping you design unique and eye-catching business cards.

33. vistaprint

known for their high-quality business cards and reasonable pricing, they also offer additional marketing collateral.

34. printfection

the home of all things merchandise and company swag -- choose from a huge variety of apparel, drinkware, and other products.

35. startup threads

you can design custom branded apparel for your small business and automatically send to loyal customers without holding any inventory.

public relations 36. help a reporter out (haro) ?

get mentioned in publications small and large by using your expert knowledge to become a source for journalists.

37. buzzstream ?

keep track of outreach efforts including prospects, their contact info, and a full history of communication.

38. mention

monitor billions of sources in real-time for any keywords you want, and reply to engage with key influencers.

39. google alerts ?

create weekly or daily alerts for key topics surrounding your brand and get an email roundup of the most popular content.

our pick: haro and google alerts

price: both are free to use

since we started using haro in 2012, we've found over 200 queries that were a perfect fit for us. voices.com has used the platform mainly for media relations, but also to help us with successfully locating expert sources for our own content creation initiatives.

customer service & helpdesk 40. helpscout

manage email at scale with features designed to maintain an organized team and happy customers.

41. groove

collaborate across your team on everything from emails to social media posts to phone calls all with one system.

42. zendesk

almost like a crm for support, you get a help desk solution, self-service tool, and insightful data on engagement.

43. desk.com

robust, out-of-the-box support with self-service options and easy scalability as your team grows.

compare these tools ? our pick: zendesk

price: \$5 - \$99 per agent per month

it gives our associates a more complete view of the customer and integrates well with a number of other platforms that we use for both customer contact management and internal reporting.

communication 44. slack ?

create a channel for your team and groups within to focus in on specific projects or departments.

45. skype

all-inclusive audio/video calls and messaging for your team to keep in touch from mobile, landline, or voip.

46. grasshopper ?

keep in touch with the office while you work from anywhere in the world with a toll free or local number that forwards to your mobile phone.

compare these tools ? our pick: slack (and grasshopper, of course!)

price: free - \$12.50/month

literally transformed the way my agency communicates. great tool for teams who do not want to rely on emails to communicate. we'll continue using for years to come.

project management 47. trello ?

create team boards with individual or project-based lists and cards with a deadline for every step of the way.

48. basecamp

a productivity app taken to the team level includes messaging, to-do lists, and document & file sharing.

49. asana

projects are easy to track from beginning to end with clear-cut responsibilities and next steps outlined.

50. teamwork

easily keep track of every team project in one place and collaborate with messaging and file sharing.

compare these tools ? our pick: trello

price: free - \$20.83 per user per month

i use it to keep all my 'things to do' in one place, and find it especially useful for those 'background tasks' - ones that don't have a defined timescale (although trello helps with those, too) but that you need to do when you have a spare 5 minutes.

productivity 51. evernote

everything you need to get done or remember, all in one place and organized into notebooks — it's as close as you can get to paper note-taking.

52. todoist

it combines the accessibility of native apps with tools for collaboration and design that fosters productivity.

53. any.do

task management for both your work and home life that syncs seamlessly across simple mobile, desktop, and web apps.

54. boomerang ?

maintain inbox zen without losing track of important messages — send them away and boomerang will return them whenever they're needed.

55. unroll.me

keep your email subscriptions in check with the quickest and easiest way to unsubscribe from marketing emails at scale.

compare these tools ? our pick: any.do

price: free - \$2.99 per user per month

i tried many apps to keep track of all my tasks but any.do is the one i have enjoyed the most. it has a very easy interface and organizes my tasks in a very simple and organized manner.

focus 56. stayfocusd

stay on track by using this plugin to limit your time on distracting websites (like facebook) or block them all together.

57. rescuetime

find out where all your time going by tracking the time you spend on different apps and websites so you can maximize your workday.

58. rainymood ?

block it out, block it all out with the ambient sound of a rainstorm — you can even set it to music.

59. spotify focus playlists ?

listen to tracks expertly selected to enhance focus and keep you on-task.

hiring & human resources 60. workable

recruiting software that combines job posting, candidate organization, and team collaboration to streamline the hiring process.

61. bamboohr

hr software targeted at small and medium sized businesses ticks off hiring tools with an employee database and reporting.

62. workday ?

recruiting, time-tracking, and payroll (among other features) all rolled up into one, scalable solution.

63. insperity

choose from a full-service, outsourced hr team or an individual solution tailored to your human resources needs.

document management 64. google drive ?

create and store word documents, slide presentations, and spreadsheets in the cloud that are accessible from anywhere.

65. office 365

get access to the full microsoft suite of products and 1 terabyte of cloud storage that you can access from up to 5 of your devices.

66. box

share files securely with team members and even create, edit, and review documents in real-time.

67. dropbox

collaborate, store, share, and backup documents, photos, and videos that automatically sync across all your devices.

compare these tools ? our pick: google drive

price: free - \$10 per user per month

unlike other cloud storage services, google drive is the one that packed with the most features. without subscription, it already offers online and offline file storage, syncing, access as well as an office suite all in one package.

tax software 68. turbotax

tax returns made easy with straightforward questions customized to you and live, on-screen help.

69. h&r block

all your forms and information in one, secure place and step-by-step guidance to help you get the most refund possible.

70. taxact

access to over 300 available deductions and credits and a price-match guarantee to get the best value.

71. jackson hewitt online

simple, online filing with affordable pricing for small businesses and a maximum refund guarantee.

compare these tools ? our pick: turbotax

price: free - \$104.99

turbotax walked me through everything. it was really easy to understand & fill out. it's accurate & secure. my taxes were a bit more complicated so it took quite a while to do but at least i know they were done right & i didn't forget anything.

entrepreneurial growth 72. clarity.fm

talk to a variety of experts with experience in every aspect of starting and growing a business.

73. edx

choose from a huge bank of professional courses online and complete them at your own pace.

74. udemy

take courses on all types of topics, from learning java coding to leveraging microsoft excel, to help you become more effective.

75. grasshopper academy

learn everything you need to know about starting, running, and marketing your business with advice from experts and successful entrepreneurs.

## pmp ittos (ultimate guide + mind maps!)

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one of the most difficult areas of the pmp (project management professional) exam is ittos. even mentioning the word 'ittos' can strike fear for many pmp candidates. this guide will explain what ittos are and how to dissect the common ittos used in the pmbok 6th edition guide.

what are ittos and how do i read an itto process chart?

ittos stand for inputs, tools & techniques, and outputs. together, they tell you how pmi wants you to complete the process.

you can read the itto chart the way you read a recipe. for example, if i was to write a process chart for baking a cake, it would look something like the following:

inputs

tools & techniques

outputs

flour  
butter  
sugar  
baking powder eggs

mixing  
baking  
whisking  
pouring  
decorating

birthday cake

the ingredients are the inputs that i need; the tools and techniques are the methods that i use to transform the inputs into the outputs; and the outputs is the final product that i'm able to produce (in this case the birthday cake).

in other words, the itto chart for each of the 49 processes tells you how you can accomplish the objective of that process.

let's take an example for the pmbok for a more realistic example. below, we have the process chart for develop project charter.

the first thing you want to do before you even look at the process chart is to understand what is the purpose of the process and what is it that it's trying to accomplish.

develop project charter is the process of developing a formal documentation that recognizes the existence of the project and gives the project manager the authority to apply organizational resources to project activities. a project cannot start without a project charter.

now that we know the purpose of this project, let's take a look at its itto process chart.

inputs

tools & techniques

outputs

business documents  
business case  
benefits management plan  
agreements  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
brainstorming  
focus groups  
interviews  
interpersonal and team skills  
conflict management  
facilitation  
meetings

project charter  
assumption log

this itto chart tells us how we can go about developing the project charter for our project. we will need to look at any relevant business documents, agreements and take any existing organizational policies or procedures into consideration.

once we have our inputs, we can meet with our experts to discuss how to create the project charter. we may also need to use data gathering techniques, such as brainstorming or interviews, in addition to interpersonal and team skills.

once we've completed the work, the final outputs that we will obtain are the project charter and the assumption log.

the itto chart above summarizes how pmi wants project managers to develop project charter in just a few words.

if the itto chart is confusing, try writing it out in layman's terms as we have done for the develop project charter process above.

tailoring considerations for ittos

note that you do not need to use all of the ittos from the chart in order to complete the process. the itto chart is meant to be comprehensive and equip the project manager for any situation that they may face.

however, in real life, the project manager will need to tailor the ittos to fit their specific project situation.

do i need to memorize all the ittos?

no, you do not need to memorize the ittos. there are on average around 10+ ittos per process. with 49 processes, it means there are 500+ ittos in the pmbok 6th edition guide.

while some of you may have photographic memory, most of us do not. the pmp exam is also not meant to be a memorization exam either.

what's more important is that you understand why the specific input, tool or technique, and output belong to that specific process.

for each itto, ask yourself, "why is it here in this process? what purpose does it serve? how does it help me accomplish the end objective?"

it's more important to understand why it is included in the itto chart than it is to memorize all 49 itto charts.

we also have an itto mind map that you can download here & register in our free pmp training that will teach you how to get certified in 6 weeks.

interactions & flows between processes

the 49 processes work together to complete the project. in other words, none of the processes work in isolation. what this means is that: the output of one process becomes the input for another process.

here's an example:

this image above is taken from figure 4-13 on page 114 of the pmbok 6th edition guide. it shows you how the outputs of the perform integrated change control process then becomes inputs for a number of other processes.

project processes do not happen in a vacuum; they work together to complete the project. the 49 processes interact with each other continuously, and outputs from one process then become inputs to another.

understanding the big picture

when you're studying for your pmp exam, it's easy to get lost analyzing the endless amounts of ittos. however, before you dive in too deeply, you always need to keep the big picture in mind.

the big picture is how pmi wants you to complete a project from start to finish. this is shown on the 49 process chart from the pmbok 6th edition (see below).

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the 49 processes chart tells you how pmi wants you to manage a project from start to finish. watch the video below for tips and tricks on how to memorize this chart for your pmp exam:

across the column headers, you have the 5 process groups (initiating, planning, executing, monitoring & controlling, and closing).

across the row headers, you have the 10 knowledge areas. in the intersection, you have 49 processes. each process has a corresponding knowledge area and process group.

you can zoom into each of the processes and take a look at its ittos – but don't lose sight of the big picture.

pro tip: although you don't need to memorize all 500+ ittos, it's a good idea to memorize the 49 process chart for your upcoming pmp exam.

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tools and techniques groups

when you deepdive into the ittos, you will start to see groupings of ittos. each grouping shows you related ittos that all have a common objective.

let's talk a look at some common groupings below:

data gathering techniques – these techniques are used to obtain & collect data from a variety of different sources.

data analysis techniques – these techniques are used to organize and evaluate the information gathered.

data representation techniques – these techniques are used to show the data in graphical forms.

decision-making techniques – these techniques are used to select a course of action after evaluating various different alternatives.

communication skills – these techniques are used to transfer information between team members or stakeholders on the project.

interpersonal and team skills – these techniques are used to lead team members and stakeholders.

here are the tools & techniques that fall under each of the groupings:

integration management ittos

integration management is the knowledge area where the project manager combines the results from all the other knowledge areas together to provide an overall view of the project.

below is the itto chart for all processes under integration management.

processes

inputs

tools & techniques

outputs

develop project charter

business documents  
agreements  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
interpersonal and team skills  
meetings

project charter

assumption log

develop project management plan

project charter  
outputs from other processes  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
interpersonal and team skills  
meetings

project management plan

direct and manage project work

project management plan  
project documents  
approved change requests  
enterprise environmental factors  
organizational process assets

expert judgment  
project management information system  
meetings

deliverables

work performance data  
issue log  
change requests  
project management plan updates  
project document updates  
organizational process assets updates

manage project knowledge

project management plan  
project documents  
deliverables  
enterprise environmental factors  
organizational process assets

expert judgment  
knowledge management  
information management  
interpersonal and team skills

lessons learned register  
organizational process assets updates  
project management plan updates

monitor & control project work

project management plan  
project documents  
work performance information  
agreements  
enterprise environmental factors  
organizational process assets

expert judgment  
data analysis  
decision making  
meetings

work performance reports  
change requests  
project management plan updates  
project document updates

perform integrated change control

project management plan  
project documents  
work performance reports  
change requests  
enterprise environmental factors  
organizational process assets

expert judgment  
change control tools  
data analysis  
decision making  
meetings

approved change requests  
project management plan updates  
project document updates

close project or phase

project charter  
project management plan  
project documents  
accepted deliverables  
business documents  
agreements  
procurement documentation  
organizational process assets

expert judgment  
data analysis  
meetings

project documents updates  
final product, service, result, or transition  
final report  
organizational process assets updates

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scope refers to the features and functions in the end project deliverable. project scope refers to the work that needs to be completed in order to complete the scope. thus, project scope management is all about determining and managing the project scope throughout the project lifecycle.

the chart below shows all of the ittos for all processes under the scope management knowledge area.

processes

inputs

tools & techniques

outputs

plan scope management

project charter  
project management plan  
enterprise environmental factors  
organizational process assets

expert judgment  
data analysis  
meetings

scope management plan  
requirements management plan

collect requirements

project charter  
project management plan  
project documents  
business documents  
agreements  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
data analysis  
decision making  
data representations  
interpersonal and team skills  
context diagrams  
prototypes

requirements documentation  
requirements traceability matrix

define scope

project charter  
project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
data analysis  
decision making  
interpersonal and team skills  
product analysis

project scope statement  
project document updates

create wbs

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
decomposition

scope baseline  
project document updates

validate scope

project management plan  
project documents  
verified deliverables  
work performance data

inspection

decision making

accepted deliverables  
work performance information  
change requests  
project document updates

control scope

project management plan  
project documents  
work performance data  
organizational process assets

data analysis

work performance information  
change requests  
project management plan updates  
project documents updates

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project scheduling involves creating a detailed plan on when which task will be completed on the project. it provides the project team with a sequence of activities, and it tells the team when the overall project will be completed.

the project schedule is a major communication tool; it can also be used to manage stakeholder expectations.

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please see the chart below for all of the ittos for project schedule management.

processes

inputs

tools & techniques

outputs

plan schedule management

project charter  
project management plan  
enterprise environmental factors  
organizational process assets

expert judgment  
data analysis  
meetings

schedule management plan

define activities

project management plan  
enterprise environmental factors  
organizational process assets

expert judgment  
decomposition  
rolling wave planning  
meetings

activity list  
activity attributes  
milestone list  
change requests  
project management plan updates

sequence activities

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

precedence diagramming method (pdm)  
dependency determination and integration  
leads & lags  
project management information system

project schedule  
network diagrams  
project document updates

estimate activity durations

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
analogous estimating  
parametric estimating  
three-point estimating  
bottom-up estimating  
data analysis  
decision making  
meetings

duration estimates  
basis of estimates  
project documents updates

develop schedule

project management plan  
project documents  
agreements  
enterprise environmental factors  
organizational process assets

schedule network analysis  
critical path method  
resource optimization  
data analysis  
leads and lags  
schedule compression  
project management information system  
agile release planning

schedule baseline  
project schedule  
schedule data  
project calendars  
change requests  
project management plan updates  
project documents updates

control schedule

project management plan  
project documents  
work performance data  
organizational process assets

data analysis  
critical path method  
project management information system  
resource optimization  
leads and lags  
schedule compression

work performance information  
schedule forecasts  
change requests  
project management plan updates  
project documents updates

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project cost management deals with the cost of all resources (human and materials) needed to complete all project tasks.

as a project manager, you want to know what individual activities will cost as well as the entire project. you need to track the project budget and produce reports about it on a regular basis.

below are the processes within cost management and their associated ittos.

processes

inputs

tools & techniques

outputs

plan cost management

project charter  
project management plan  
enterprise environmental factors  
organizational process assets

expert judgement  
data analysis  
meetings

cost management plan

estimate costs

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
analogous estimating  
parametric estimating  
bottom-up estimating  
three-point estimating  
data analysis  
project management information system  
decision making

cost estimates  
basis of estimates  
project documents updates

determine budget

project management plan  
project documents  
business documents  
agreements  
enterprise environmental factors  
organizational process assets

expert judgement  
cost aggregation  
data analysis  
historical information review  
funding limit reconciliation  
financing

cost baseline  
project funding requirements  
project documents updates

control costs

project management plan  
project documents  
project funding requirements  
work performance data  
organizational process assets

experts judgment  
data analysis  
to-complete performance index (tcpi)  
project management information system

work performance information  
cost forecasts  
change requests  
project management plan updates  
project documents updates

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quality is “the degree to which a set of inherent characteristics fulfills requirements” (iso 9000).

project managers should prevent quality issues from getting into the end deliverable. it is usually less costly to prevent problems than to fix it once the product is in the hands of the customer.

the project manager seeks to minimize the overall cost of quality, which is the sum of cost of conformance and cost of nonconformance.

before the project ends, the project manager needs to inspect the deliverable to ensure that it meets the agreed upon quality standards.

please see below for the ittos of all quality management processes.

processes

inputs

tools & techniques

outputs

plan quality management

project charter  
project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgement  
data gathering  
data analysis  
decision making  
data representation  
test and inspection planning  
meetings

quality management plan  
quality metrics  
project management plan updates  
project documents updates

manage quality

project management plan  
project documents  
organizational process assets

data gathering  
data analysis  
decision making  
data representation  
audits  
design for x  
problem solving  
quality improvement methods

quality reports  
test and evaluation documents  
change requests  
project management plan updates  
project documents updates

control quality

project management plan  
project documents  
approved change requests  
deliverables  
work performance data  
enterprise environmental factors  
organizational process assets

data gathering  
data analysis  
inspection  
testing/product evaluation  
data representation  
meetings

quality control measurements  
verified deliverables  
work performance information

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change requests  
project management plan updates  
project document updates

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project resources include both physical resources (e.g. equipments and materials) and team resources.

resource management revolves around the management of all resources on the project. the project manager needs to use different skills when managing physical and team resources.

when managing teams, the project manager needs to be aware of the organization's culture, geographic location, and internal & external team influences.

the chart below shows all of the processes within resource management plus their corresponding ittos.

processes

inputs

tools & techniques

outputs

plan resource management

project charter  
project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgement  
data representation  
organizational theory  
meetings

resource management plan

team charter

project documents updates

estimate activity resources

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgement  
bottom-up estimating  
analogous estimating  
parametric estimating  
data analysis  
project management information system  
meetings

resource requirements  
basis of estimates  
resource breakdown structure  
project documents updates

acquire resources

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

decision making  
interpersonal and team skills  
pre-assignment  
virtual teams

physical resource assignments  
project team assignments  
resource calendars  
change requests  
project management plan updates  
project documents updates  
enterprise environmental factors updates  
organizational process assets updates

develop team

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

colocation  
virtual teams  
communication technology  
interpersonal and team skills  
recognition and rewards  
training  
individual and team assessments  
meetings

team performance assessments  
change requests  
project management plan updates  
project documents updates  
enterprise environmental factors updates  
organizational process assets updates

manage team

project management plan  
project documents  
work performance reports  
team performance assessments  
enterprise environmental factors  
organizational process assets

interpersonal and team skills  
project management information system

change requests  
project management plan updates  
project documents updates  
enterprise environmental factors updates

control resources

project management plan  
project documents  
work performance data  
agreements  
organizational process assets

data analysis  
problem solving  
interpersonal and team skills  
project management information system

work performance information  
change requests  
project management plan updates  
project documents updates

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communication is the process of exchanging information. communications on the project can be internal or external, formal or informal, written or oral.

as a project manager, you need to manage your communication upwards to senior management and project sponsors, downwards to team members, and horizontally to other peers.

communication is the main task of a project manager, and you will constantly be doing it throughout the project. effective communications is essential to ensure project success.

we have all the communications management processes and their respective ittos in the chart below.

processes

inputs

tools & techniques

outputs

plan communications management

project charter  
project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgement  
communication requirements analysis  
communication technology  
communication models  
communication methods  
interpersonal and team skills  
data representation  
meetings

communications management plan  
project management plan updates  
project documents update

manage communications

project management plan  
project documents  
work performance reports  
enterprise environmental factors  
organizational process assets

communication technology  
communication methods  
communication skills  
project management information system  
project reporting  
interpersonal and team skills  
meetings

project communications  
project management plan updates  
project document updates  
organizational process assets updates

monitor communications

project management plan  
project documents  
work performance data  
enterprise environmental factors  
organizational process assets

expert judgement  
project management information system  
data representation  
interpersonal and team skills  
meetings

work performance information  
change requests  
project management plan updates  
project documents updates

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risk is an uncertain event that may or may not happen in the future. project risk management aims to identify and manage risks throughout the project lifecycle.

risks can be positive or negative. a positive risk is called an opportunity, and a negative risk is called a threat.

new risks can occur at any time on the project, so the project manager needs to perform the risk management processes continuously.

below are the ittos for all the risk management processes.

processes

inputs

tools & techniques

outputs

plan risk management

project charter  
project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
data analysis  
meetings

risk management plan

identify risks

project management plan  
project documents  
agreements  
procurement documentation  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
data analysis  
interpersonal and team skills  
prompt lists  
meetings

risk register  
risk reports  
project documents updates

perform qualitative risk analysis

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment

data gathering  
data analysis  
interpersonal and team skills  
risk categorization  
data representation  
meetings

project documents updates

perform quantitative risk analysis

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
interpersonal and team skills  
representations of uncertainty  
data analysis

project documents updates

plan risk responses

project management plan  
projects documents  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
interpersonal and team skills  
strategies for threats  
contingent response  
strategies strategies for overall project risk  
data analysis  
decision making

change requests  
project management plan updates  
project documents updates

implement risk responses

project management plan  
project documents  
organizational process assets

expert judgement  
interpersonal and team skills  
project management information system

change requests  
project documents updates

monitor risks

project management plan  
project documents  
work performance data  
work performance reports

data analysis  
audits  
meetings

work performance information  
change requests  
project management plan updates  
project documents updates  
organizational process assets updates

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procurement involves obtaining goods and services from a third party vendor. as a project manager, you need to be familiar with the procurement management processes of your organization, and know how to procure, select and manage contractors on your project.

the signed contract between the buyer and seller is a legally binding document, and there is usually an extensive approval process. the 3 main types of contracts that you may have on your project are: fixed cost, time and material, and cost reimbursable.

all of the procurement processes are listed below along with their respective ittos.

processes

inputs

tools & techniques

outputs

plan procurement management

project charter  
business documents  
project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
data analysis  
source selection analysis  
meetings

procurement management plan  
procurement strategy  
bid documents  
procurement statement of work  
source selection criteria  
make-or-buy decisions  
independent cost estimates  
change requests  
project documents updates  
organizational process assets updates

conduct procurements

project management plan  
project documents  
procurement documentation  
seller proposals  
enterprise environmental factors  
organizational process assets

expert judgment  
advertising  
bidder conferences  
data analysis  
interpersonal and team skills

selected sellers  
agreements  
change requests  
project management plan updates  
project document updates  
organizational process assets updates

control procurements

project management plan  
project documents  
agreements  
procurement documentation  
approved change requests  
work performance data  
enterprise environmental factors  
organizational process assets

expert judgment  
claims administration  
data analysis  
inspection  
audits

closed procurements  
work performance information  
procurement documentation updates  
change requests  
project management plan updates  
project documents updates  
organizational process assets updates

download the free itto charts + register for the free webclass stakeholder management ittos

a stakeholder is anyone with a stake on the project. a stakeholder can be positively or negatively impacted by the project. some stakeholders have limited ability to influence project outcomes, while others have significant power and influence. it's important for the project manager to know what the stakeholder's stake is and how much power they have.

it is the project manager's job to communicate with the stakeholders and manage their expectations accordingly. identifying and managing stakeholders are done continuously throughout the project.

please see the chart below for all processes and ittos associated with stakeholder management.

you should also read: pmp 5th edition itto commonly asked questions answered

processes

inputs

tools & techniques

outputs

identify stakeholders

project charter  
business documents  
project management plan  
project documents  
agreements  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
data analysis  
data representation  
meetings

stakeholder register  
change requests  
project management plan updates  
project documents updates

plan stakeholder engagement

project charter  
project management plan  
project documents  
agreements  
enterprise environmental factors  
organizational process assets

expert judgment  
data gathering  
data analysis  
decision making  
data representation  
meetings

stakeholder engagement plan  
manage stakeholder engagement

project management plan  
project documents  
enterprise environmental factors  
organizational process assets

expert judgment  
communication skills  
interpersonal and team skills  
ground rules  
meetings

change requests  
project management plan updates  
project documents updates

monitor stakeholder engagement

project management plan  
project documents  
work performance data  
enterprise environmental factors  
organizational process assets

data analysis  
decision making  
data representation  
communication skills  
interpersonal and team skills meetings

work performance information  
change requests  
project management plan updates  
project documents updates

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  - chairman's message
  - sustained development
- solutions
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  - piping systems usage
  - ultimate solutions

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  - catalogues & downloads
  - certifications
  - guidelines
    - welding
    - linear expansion
    - raktherm pressure test
    - standards & regulations
    - transport & storage
- raktherm academy
- raktherm worldwide
  - global networks
  - mega projects
  - become stockist
  - join myraktherm
- contacts
  - meet our team
  - join our team
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  - raktherm quality
- services & support
  - catalogues & downloads
  - certifications
  - guidelines
- raktherm academy
- raktherm worldwide
  - global networks
  - mega projects
  - become stockist
- contacts
- en
  - english
  - arabic

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raktherm decalcifer

the eminent high-end global manufacturer of piping systems technology

we are committed to making a real difference in providing hi-technological piping innovations that are breakthrough in the industry to build the most iconic projects in the world!

raktherm has formidable market presence within global operational hubs for extensive distribution in several countries across the regions of gcc, north & south africa, and south & east asia, and europe.

about us raktherm unveils the groundbreaking rnp technology bringing technological breakthrough in the piping industry!

with raktherm's groundbreaking rnp technology, the pipe's uniform middle-layer-construction is based on special cells to ensure increased in mechanical properties, wherein the inner-layer and outer-layer are combined, forming like a 'sandwich construction' which results to exceed the requirement for noise reduction, durability, flexibility, and longer-service-life. a state of the art three-layers-pipe with solid-wall-construction, made from the new generation premium materials which significantly improve its durability compared to the traditional pipes.

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the new generation technology for intensified piping networks

strengthened with stabi and fiber

decreased linear expansion and higer flow rate

raktherm welding devices and welding tools to ensure proper fusion of pipes and fittings. it is widely acknowledged, in order to establish a consistent and structurally sound joint, it is necessary to follow raktherm fusion welding preparation procedure.

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words from our chairman, mr. ali hashim on the daily news of the big5 2019....

raktherm unleashed potential in piping solutions with its ground-breaking rnp technology

...

quality guarantee maintaining a high level of quality

raktherm maintains a highly comprehensive quality control management program. be it the designing process which follows certain specifications, choice of raw materials, packing, storage, shipping to customers

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